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Research Article

Treading the Thin Line Between Health Ethics and Patient Care in the Application of Telemedicine: The Case of Sound Ethical Guidelines in Telemedicine in Sub-Saharan Africa

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The entry of technology and digital platforms into the health sector has allowed for the expansion of healthcare from traditional healthcare facilities, thereby overcoming geographical barriers and giving birth to telemedicine. Information technologies enable the delivery of healthcare services, even when distance is a critical factor. These technologies facilitate the exchange of valid information for diagnosis, treatment, and management of diseases and injuries. They also aid in research and evaluation, and support the continuing education of healthcare providers. These efforts are aimed at improving the health of individuals and communities. However, despite providing a platform where health can be easily accessible to all despite location, telemedicine also exposes patients to unethical practices, such as leaking their data to non-intended users and sometimes hackers, highlighting the need for sound ethical governance practices. There is a need for ethical governance and regulatory frameworks for the application and use of digital technology in health, which will minimise the infringement of patients' ethical rights and privacy.

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Introduction

The healthcare industry has evolved significantly in the 21st century with the help of rapid technological advancements. Digital health is a general term that refers to the utilisation of communication and information technologies in managing health risks and illnesses, as well as promoting overall wellness (WMA, 2022). The emergence of telemedicine, a technology-driven approach, has brought about significant changes in the medical field. It has made it possible to extend healthcare services beyond traditional physical facilities, such as consultation rooms, clinics, and hospitals, by leveraging information technology. This has helped overcome geographical barriers and provide healthcare services to remote areas (Srinivasan et al., 2020). Telemedicine (TM) is defined as the "delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities' (WHO, 2010). Utilising telemedicine enhances accessibility by providing flexibility and convenience and reducing financial constraints for both general and specialised healthcare (Kruse et al., 2018).

Originally, TM has always been prioritised to cater to remote, underserved areas in emergencies and disasters (Romanick-Schmiedl & Raghu, 2020); however, with the dawn of twenty-first century, there has been an increase in technological advancements that the healthcare sector in sub-Saharan Africa (SSA) can capitalise to reduce inequalities in health delivery. Additionally, TM offers a digital exchange of health information that can be extracted from wearable devices that individuals are increasingly utilising globally. Quick exchanges via cell phones, tablets, and patient portals allow updates and reminders of vital health procedures that can be leveraged to monitor and manage chronic conditions (Romanick-Schmiedl & Raghu, 2020). Over the last few decades, SSA has witnessed a significant increase in the burden of noncommunicable diseases (NCDs) the management of which can benefit immensely from TM (Gouda et al., 2019). TM has shown its vitality during the peak of the coronavirus disease-2019 (COVID-19) pandemic when lockdowns and physical distancing were practiced, and the management of people with chronic medical conditions has become a challenge. TM has enabled continuity of care and proved to be a safe and effective alternative to patient care(Portnoy et al., 2020).

Access to healthcare is a fundamental right of every person. In 2015, 193 nations committed to the United Nations (UN) Sustainable Development Goals (SDGs), with health-related SDG 3 emphasising equity to ensure healthy lives and promote well-being for all at all ages(Hosseinpoor et al., 2018). Despite this commitment, access to health remains an elusive dream among citizens of many countries in SSA. To fulfil the agenda 2030 target in terms of meeting the dictates of the SDGs, there is a need for strategies to help alleviate and address the inadequacies of these health systems (Dourado et al., 2020) which the COVID-19 pandemic has exacerbated. The COVID-19 pandemic has dramatically transformed the healthcare system. The employment of physical distancing, quarantine, and lockdowns helped limit the transmission of COVID-19 (Mann et al., 2020) despite a concomitant effect on other health disorders. Therefore, TM implementation will avert complications that can lead to negative health outcomes. The poor quality of healthcare services in SSA has been essentially due to the critical shortage of healthcare workers, healthcare infrastructure, and multiple burdens of disease such as rising NCDs, HIV/AIDS, tuberculosis, and malaria (Armaignac et al., 2018; Fusaro et al., 2021). Thus, the expansion of TM to non-traditional health settings could be a significant factor in ameliorating the inaccessibility to care (Bouskill et al., 2018). However, there is a need to tread carefully, following sound ethical guidelines and respect, and according to patients, the rights of their rights in all its applications.

The current state of Telemedicine in SSA

Sub-Saharan Africa is home to approximately 1.2 billion people, with a low physician-to-population ratio of approximately 1:30000, compared to 1:300 in a high-income country (Combi et al., 2016). This makes the continent an ideal place to implement TM to close the vast disparity in the healthcare worker (HCW) ratio(Combi et al., 2016). However, a 2021 review highlighted that the use of TM is limited to the continent. Only eight countries had published data on the use of TM, and the use of the TM platform increased during the COVID-19 pandemic, as countries sought to decongest healthcare facilities and ensure continuity of healthcare provision. TM was primarily used for patient consultation and monitoring to ensure medication adherence and provide psychological support and medical training for healthcare workers. The leading platforms were the telephone, short message services (SMS), and WhatsApp. Among the significant impediments to the adoption and use of TM are the high cost of connectivity (phone and Internet charges), lack of electronic medical records, digital illiteracy, cultural and language barriers, and limited knowledge of the availability of TM services (Chitungo et al., 2021).

In another study, the use of TM in Africa was limited to donor-initiated projects in a few countries. However, some countries, such as Ghana and Uganda, are setting up teleconsulting centres in their countries. The significant barriers to the adoption of TM were HCW's reluctance to use TM, limited infrastructure, and lack of political will to implement clear policies and provide budgetary support (Mbunge et al., 2022). South Africa is a model for adopting and using TM in the continent. At the height of the pandemic, the country instituted changes in its medical policy to increase the utilisation of TM, which increased the adoption of digital technologies (Chitungo et al., 2021). The most commonly used digital technologies for healthcare include SMS-based solutions, mobile health applications, WhatsApp-based systems, artificial intelligence (AI), and chatbots. These are used for various purposes, such as screening, consultations, surveillance and monitoring, and medication and treatment compliance. Policy changes that allowed healthcare workers to claim services from medical insurers played a significant role in the increased adoption and use of these technologies (Chitungo et al., 2021). However, African countries face similar barriers to TM adoption, including infrastructural, technological, organisational, financial, cultural, policy, and regulatory obstacles.

Ethics in Healthcare delivery

Health ethics refer to the principles guiding healthcare workers in providing medical care to patients. This enables healthcare providers to make respectful, equitable, and effective decisions (Varkey, 2021). The value of ethics in resolving conflicts between healthcare workers, patients, and their relatives cannot be underestimated (Haddad & Geiger, 2022). While diverse healthcare workers have dissimilar professional and moral beliefs regarding how best to treat patients, ethics enable these differences to be resolved with respect and communication (Lulé et al., 2019). Additionally, ethics allow healthcare workers to execute their duties with confidence and a clear conscience, align their actions and decisions to be patient-centred, and prevent unethical behaviours (Samuel et al., 2022). With moral predicaments of life and death decisions in healthcare, ethics helps inform care considerations, particularly in fast-paced emergencies (Lulé et al., 2019). The guiding principle of ethics in health is to provide prompt, thorough, and appropriate care and treatment to patients while ensuring their safety. This principle anchors four important constructs: autonomy, beneficence, non-maleficence, and justice (Teven & Gottlieb, 2018). Autonomy requires healthcare workers to respect patients' rights to make decisions regarding treatment, care, testing, or procedures without imposing them based on their opinions (Fenton et al., 2015). In beneficence, healthcare workers should make choices for the patient's good that are acceptable to the patient's culture, beliefs, outlook, and desires(Teven & Gottlieb, 2018). Maleficence demands not harming patients, colleagues, or vendors when providing services. The justice construct demands that all patients be treated fairly and equally, regardless of ethnicity, background, socioeconomic status, or religion (Haddad and Geiger, 2022).

Maintaining ethical healthcare provider-healthcare user relationship in the context of Telemedicine in SSA

In the same way as the ethical values of autonomy, beneficence, nonmaleficence, and justice are required in face-to-face medicine, TM likewise requires that healthcare providers (HCPs) adhere to these same principles (Nebeker et al., 2019). Before storing patient-identifiable information in their health databases, HCPs are required to obtain informed consent from patients to comply with the autonomy standards of TM (Aicardi et al., 2016). For the patient to provide informed consent, they should be provided with clear information on how the data obtained will be used, the goal of data usage, the amount of time that the data will be retained, and the confidentiality arrangements that will be put into place (Aicardi et al., 2016). It is important to clarify that patients hold the right to request the correction of any mistakes or omissions in their data as well as the right to withdraw their consent for their identifiable information to be included in a health database. These rights should be communicated to patients prior to their agreement to add their information to a health database (Brall et al., 2019). The steps taken to obtain informed consent should be documented for use in the event of a dispute in the future, and if practical, a signed informed consent form should be collected. If a patient withdraws their consent for their identifiable information to remain included in a health database, the patient should not be penalised; instead, they should be given options on how their information can be stored differently (Saksena et al., 2021).

It is the responsibility of HCPs to protect the patient's sense of dignity at all times, especially when breaking upsetting news for patients. Patients should also have the right to choose whether to obtain specific test results. HCPs should ensure that patients are adequately counselled and ready to accept the results, especially in cases where the results may result in psychological harm (Brall et al., 2019). The HCPs are also responsible for ensuring that the obtained data are kept confidential. This necessitates the protection of data, maintenance of confidentiality, and establishment of clear criteria for data sharing, as well as the intended and inadvertent utilisation of the data(Jokinen et al., 2021). It is the responsibility of HCPs to guarantee that data are stored securely, free from the possibility of unauthorised access via means such as hacking. This is very important because if unauthorised access is gained, patient data could be used to stigmatise or discriminate against them. When anything like this occurs, HCPs violate the principle of non-maleficence, which states that they should not cause harm (Brall et al., 2019). The information obtained from patients must be kept confidential. When such data are going to be used by other stakeholders who are not the HCPs of patients, it is crucial to assess the purpose of this use and whether the patients whose data are going to be used will receive any benefits from this usage (Aicardi et al., 2016). The HCPs must obtain patient consent before using their data in the future. This consent should encompass the intended and unexpected use of individual data because the data may be utilised in the future for research or circumstances that nobody could have anticipated. If such consent was not obtained during the initial collection of the data and there was no means of obtaining such consent when the data were to be used, then such data could not be used by other stakeholders unless they were anonymised beforehand (Brall et al., 2019).

The case to have sound Ethical Telemedicine guidelines while leveraging TM in patient care for sub-Saharan Africa

Increasing access to modern technology on the continent presents an opportunity to scale-up TM to improve healthcare delivery. However, TM poses legal and ethical challenges, such as a change in the traditional fiduciary HCW-patient relationship and patient data security, which require standardisation and regulatory processes (Solimini et al., 2021). Thus, healthcare delivery through these platforms must remain guided by the tenets of ethical imperatives that "place patient welfare above other interests (fidelity), provide competent care, provide the information patients and their surrogates need to make well-considered decisions about care (transparency), respect patient privacy and confidentiality, and take steps to ensure continuity of care." (Chaet et al., 2017)The use of TM on the continent demands consideration of the same ethical model based on the four principles of autonomy, beneficence, non-maleficence, and justice. As published by Beauchamp and Childress (2019), these four principles are built upon the Hippocratic oath (Miles, 2004). Autonomy-informed consent TM platforms should be transparent to the patients. Thus, vendors and HCWs must disclose their credentials and pertinent information on the TM platform to enable patients to provide critical information that allows them to make informed decisions regarding their management.

Beneficence demands that HCW be competent in having appropriate clinical qualifications, experience, and skills to use digital platforms to address the patient's specific health query while respecting their beliefs. Additionally, HCWs should recognise the limitations of TM technologies and provide a necessary referral for in-person care to ensure continuity of care (Chaet et al., 2017). Consequently, the ethical use of digital health should be beneficial to patients and promote Sustainable Development Goals (SDG) number 3 (SDG, 2019), which promotes good health and well-being.

Non-maleficence prevents harm by actively promoting confidentiality, safety/safeguarding, and security (Solimini et al., 2021). It operationalises the concept of ''not harming' through ethical codes of conduct practice. The ethical codes of conduct should safeguard against both physical- and rights-based harm. Practitioners on the TM platform must strictly adhere to sound privacy practices; likewise, vendors of these platforms must display their privacy policies to all users. Furthermore, a patient data protection policy should be readily available for inspection by patients and HCWs on all vendor platforms. HCW must alert telemedicine patients to the data security protocols of TM platforms to allow them to take the necessary steps to protect confidential information (Chaet et al., 2017). Non-maleficence codes of practice must be in place to guide HCWs and protect patients from using TM.

Justice: No discrimination. One of the hindrances to the use of TM is the cultural and language barrier. To overcome this barrier, TM should have policies that promote the use of patients' native languages as communication media. Remote areas could potentially be disadvantaged due to limited access to Internet connectivity, compatible digital devices, or technological illiteracy that hampers the use of TM, which is against the principle of justice, including equal access to care and fair distribution of technology for marginalised communities(Solimini et al., 2021). Investment in appropriate infrastructure and education will help to equip this community and ensure TM equity. The World Health Organization (WHO) highlights that digital health should benefit people ethically, safely, securely, and equitably. Furthermore, the provision of digital health should be patient-centric (WHO 2020).

Conclusion

Telemedicine and its associated digital health platforms, such as artificial intelligence (AI), big data, and bioinformatics, pose unique challenges to normative ethical principles. For instance, ethical concerns regarding AI have broadly coalesced into transparency, justice and fairness, non-maleficence, responsibility, and privacy. Documented cases of discrimination and potential bias associated with these emerging technologies warrant appropriate safeguards through the development of robust ethical guidelines on the use of digital health technologies. Most published normative guidelines for these emerging technologies have been developed for high-income countries. To date, SSA has provided minimal input to the development of ethical guidelines, primarily through supranational instruments, such as the OECD. As the breadth and depth of ethical issues affected by the use of digital health in SSA are low, inclusive consultation, identification, and analysis of pertinent ethical problems should be used to provide a foundation for ethical guideline development. Additionally, since ethical constraints arising from digital health use are context-dependent, local ethical guidelines should be developed to incorporate the lived experiences of the local populace. Local ethical guidelines should include the principles of Ubuntu to ensure acceptability. Ethical guidelines for digital health use in SSA should be augmented using a multilayered approach that incorporates laws, policies, and regulations.

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Conflict of Interest Declaration

The authors declare that they have no affiliations with or involvement in any organisation or entity with any financial interest in the subject matter or materials discussed in this manuscript.

Author Contributions

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- **Supervision:** TD

References

- Aicardi, C., Del Savio, L., Dove, E. S., Lucivero, F., Tempini, N., & Prainsack, B. (2016). Emerging ethical issues regarding digital health data. On the World Medical Association Draft Declaration on

Ethical Considerations Regarding Health Databases and Biobanks. *Croatian Medical Journal*, *57*(2), 207–213. https://doi.org/10.3325/CMJ.2016.57.207

- Armaignac, D. L., Saxena, A., Rubens, M., Valle, C. A., Williams, L. M. S., Veledar, E., & Gidel, L. T. (2018). Impact of telemedicine on mortality, length of stay, and cost among patients in progressive care units: Experience from a large healthcare system. *Critical Care Medicine*, *46*(5), 728–735. https://doi.org/10.1097/CCM.0000000000002994
- Bouskill, K., Smith-Morris, C., Bresnick, G., Cuadros, J., & Pedersen, E. R. (2018). Blind spots in telemedicine: a qualitative study of staff workarounds to resolve gaps in diabetes management. *BMC Health Services Research*, *18*(1). https://doi.org/10.1186/s12913-018-3427-9
- Brall, C., Schröder-Bäck, P., & Maeckelberghe, E. (2019). Ethical aspects of digital health from a justice point of view. *European Journal of Public Health*, *29*(Supplement_3), 18–22. https://doi.org/10.1093/EURPUB/CKZ167
- Chaet, D., Clearfield, R., Sabin, J. E., & Skimming, K. (2017). Ethical practice in Telehealth and Telemedicine. *Journal of General Internal Medicine*, *32*(10), 1136–1140. https://doi.org/10.1007/S11606-017-4082-2/METRICS
- Chitungo, I., Mhango, M., Mbunge, E., Dzobo, M., Musuka, G., & Dzinamarira, T. (2021). Utility of telemedicine in sub-Saharan Africa during the COVID-19 pandemic. A rapid review. *Human Behavior and Emerging Technologies*, *3*(5), 843–853. https://doi.org/10.1002/HBE2.297
- Combi, C., Pozzani, G., & Pozzi, G. (2016). Telemedicine for Developing Countries. A Survey and Some Design Issues. *Applied Clinical Informatics*, *7*(4), 1025–1050. https://doi.org/10.4338/ACI-2016-06-R-0089
- Dourado, I., Magno, L., Soares, F., Massa, P., Nunn, A., Dalal, S., & Grangeiro, A. (2020). Adapting to the COVID-19 Pandemic: Continuing HIV Prevention Services for Adolescents Through Telemonitoring, Brazil. *AIDS and Behavior*, *0123456789*, 1–6. https://doi.org/10.1007/s10461-020-02927-w
- Fenton, E., Chillag, K., & Michael, N. L. (2015). Ethics Preparedness for Public Health Emergencies: Recommendations From the Presidential Bioethics Commission. http://Dx.Doi.Org/10.1080/15265161.2015.1054162 , 15(7), 77–79. https://doi.org/10.1080/15265161.2015.1054162
- Fusaro, M. v., Becker, C., Miller, D., Hassan, I. F., & Scurlock, C. (2021). ICU Telemedicine Implementation and Risk-Adjusted Mortality Differences Between Daytime and Nighttime Coverage. *Chest*, *159*(4), 1445–1451. https://doi.org/10.1016/J.CHEST.2020.10.055

- Gouda, H. N., Charlson, F., Sorsdahl, K., Ahmadzada MPH, S., Ferrari, A. J., Erskine, H., Leung, J., Santamauro, D., Lund, C., Ndemnge Aminde, L., Mayosi MBChB, B. M., Pascal Kengne, A., Harris, M., Achoki, T., Wiysonge, C. S., Stein, D. J., & Whiteford, H. (2019). Burden of non-communicable diseases in sub-Saharan Africa, 1990Ã¢â‚¬â€œ2017: results from the Global Burden of Disease Study 2017. In *The Lancet Global Health* (Vol. 7). https://doi.org/10.1016/S2214-109X(19)30374-2
- Hosseinpoor, A. R., Bergen, N., Schlotheubera, A., & Grove, J. (2018). *Measuring health inequalities in the context of sustainable development goals.* https://doi.org/10.2471/BLT.18.210401
- Jokinen, A., Stolt, M., & Suhonen, R. (2021). Ethical issues related to eHealth: An integrative review. *Nursing Ethics*, *28*(2), 253–271. https://doi.org/10.1177/0969733020945765/ASSET/IMAGES/LARGE/10.1177_0969733020945765-FIG2.JPEG
- Kruse, C. S., Karem, P., Shifflett, K., Vegi, L., Ravi, K., & Brooks, M. (2018). Evaluating barriers to adopting telemedicine worldwide: A systematic review Introduction Rationale. *Journal of Telemedicine and Telecare*, 24(1), 4–12. https://doi.org/10.1177/1357633X16674087
- Lulé, D., Kübler, A., & Ludolph, A. C. (2019). Ethical Principles in Patient-Centered Medical Care to Support Quality of Life in Amyotrophic Lateral Sclerosis. *Frontiers in Neurology*, *10*. https://doi.org/10.3389/FNEUR.2019.00259
- Mann, D. M., Chen, J., Chunara, R., Testa, P. A., & Nov, O. (2020). COVID-19 transforms health care through telemedicine: evidence from the field. *Journal of the American Medical Informatics Association: JAMIA*, *0*(0), 1–4. https://doi.org/10.1093/jamia/ocaa072
- Mbunge, E., Batani, J., Gaobotse, G., & Muchemwa, B. (2022). Virtual healthcare services and digital health technologies deployed during coronavirus disease 2019 (COVID-19) pandemic in South Africa: a systematic review. *Global Health Journal*, *6*(2), 102–113. https://doi.org/10.1016/J.GLOHJ.2022.03.001
- Miles, S. (2004). *The Hippocratic oath and the ethics of medicine*. Oxford University Press.
- Nebeker, C., Torous, J., & Bartlett Ellis, R. J. (2019). Building the case for actionable ethics in digital health research supported by artificial intelligence. *BMC Medicine*, *17*(1), 1–7. https://doi.org/10.1186/S12916-019-1377-7/TABLES/1
- Portnoy, J., Waller, M., Elliott, T., City, K., & York, N. (2020). Telemedicine in the Era of COVID-19. *The Journal of Allergy and Clinical Immunology in Practice*, *8*, 1489–1491. https://doi.org/10.1016/j.jaip.2020.03.008

- Romanick-Schmiedl, S., & Raghu, G. (2020). Telemedicine-maintaining quality during times of transition. *Nature Reviews Disease Primers*, *6*. https://doi.org/10.1038/s41572-020-0185-x
- Saksena, N., Matthan, R., Bhan, A., & Balsari, S. (2021). Rebooting consent in the digital age: a governance framework for health data exchange Analysis. *BMJ Global Health*, *6*, 5057. https://doi.org/10.1136/bmjgh-2021-005057
- Samuel, G., Ballard, L. M., Carley, H., & Lucassen, A. M. (2022). Ethical preparedness in health research and care: the role of behavioural approaches. *BMC Medical Ethics*, *23*(1), 115. https://doi.org/10.1186/S12910-022-00853-1
- Solimini, R., Busardò, F. P., Gibelli, F., Sirignano, A., & Ricci, G. (2021). Ethical and Legal Challenges of Telemedicine in the Era of the COVID-19 Pandemic. *Medicina 2021, Vol. 57, Page 1314*, *57*(12), 1314. https://doi.org/10.3390/MEDICINA57121314
- Srinivasan, R., Ben-Pazi, H., Dekker, M., Cubo, E., Bloem, B., Moukheiber, E., Gonzalez-Santos, J., & Guttman, M. (2020). *Telemedicine for Hyperkinetic Movement Disorders*. https://doi.org/10.7916/tohm.v0.698
- Teven, C. M., & Gottlieb, L. J. (2018). The Four-Quadrant Approach to Ethical Issues in Burn Care. *AMA Journal of Ethics*, *20*(1), 595–601. https://doi.org/10.1001/JOURNALOFETHICS.2018.20.6.VWPT1-1806
- WMA. (2022). World Medical Association. Guiding principles for the use of telehealth for the provision of healthcare. https://www.wma.net/policies-post/wma-statement-on-guiding-principles-for-the-use-of-telehealth-for-the-provision-of-health-care/(last accessed 05/01/2024)

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