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Jackline Waburaka Shikunyi[1], Jasper Malcom Ondulo[1] & Kelvin Kabeti Omieno[2]
[1]*Masinde Muliro University of Science and Technology, Kenya*
[2]*Kaimosi Friends University, Kenya*

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Abstract
The integration of e-Health into health has the potential to transform healthcare service delivery by increasing quality. Quality service delivery has the following components: safety, timeliness, effectiveness, efficiency, patient-centeredness, and equity. However, the uptake and routinisation of these systems remain a challenge, particularly in developing countries. The paper adopted a narrative literature review approach to explore determinants that influence e-Health routinisation in public healthcare facilities. The search was conducted across multiple academic databases, including PubMed, Google Scholar, and JSTOR, using the key terms "e-Health," "routinisation," "Kenya," "health facilities," "health information systems," and "digital health adoption." The study peer-reviewed articles, reports, and relevant policy documents published between 2014 and 2023. The findings show that organisational support, user training, technological infrastructure, and the involvement of stakeholders in design as critical to the successful implementation of e-Health and its routinisation. Challenges such as inadequate infrastructure, user involvement during implementation, and resistance to change hinder uptake and widespread use of routinisation. If these challenges are adequately addressed, uptake of e-Health routinisation will easily be achieved.

Introduction
e-Health uses emerging Information Technologies (IT) through internet connectivity to improve quality healthcare service delivery. Hsieh (2015) believes that healthcare professionals' uptake and use of e-health are critical to effectively deploying these systems. E-health routinisation is the process of integrating digital health technologies such as electronic health record (EHR), electronic medical record (EMR), computerised physician order entry (CPOE), telemedicine, etc. to seamlessly be a daily workflow practice for healthcare providers to a point where their use is no longer perceived as extraordinary. This integration makes using e-health a standard and expected part of healthcare service delivery rather than a new or occasional activity. Heath (2018) believes that e-health routinisation is critical in ensuring that healthcare facilities achieve their full potential in improving healthcare service delivery quality (safety, timeliness, effectiveness, efficiency, patient-centeredness and equity) and accessibility.

Despite significant investments in e-health by public healthcare facilities, the implementation and routinisation of these systems have yet to achieve their full primary potential to benefit the healthcare sector greatly. Challenges such as usability, low technology uptake, inadequate technology infrastructure, user involvement, insufficient training, and change management remain unaddressed, leading to healthcare providers' underutilisation of these systems. Addressing these gaps requires a

coordinated effort involving leadership, policy changes, technical improvements and training. Sylva et al. (2012) observe that the potential of e-health to address healthcare challenges such as increased demand, quality and equitable distribution, the implementation of long-term strategies, policy guidelines, and standards remains inconsistent.

The paper purposed to address the current challenge of e-health routinisation and uptake in public healthcare facilities by looking at the determinants. Though the routinisation of e-Health is a complex, multi-dimensional process, it requires careful orchestration and continuous adaptation to achieve its intended benefits. Goh et al. (2011) argue that for it to be successful, it entails a constant interaction and mutual development among technological availability, end-users, medical procedures, and organisational backing, necessitating proactive oversight and proactive measures to cultivate a positive feedback loop of adaptation and integration. Bergua and Bouisson (2008) argue that the complexity of e-health often leads to varied levels of sophistication in their use, with some healthcare professionals resorting to workarounds that can compromise patient safety and hinder the benefits of these technologies. According to Cunningham et al. (2013), the concept of routinisation is not limited to healthcare; it is also observed in other domains, such as the elderly, where it involves consistent performance of activities over time, highlighting its multilayered nature and its role in adaptive functioning. Perrin (2019) is of the view that the widespread uptake of consumer and industry-standard technologies in everyday life underscores the potential for e-health technologies to become universal, thereby eliminating inefficiencies and improving service delivery. Duettmann et al. (2020) Views that the production of digital health initiatives often leads to "pilotitis," where many projects fail to reach critical mass, adequate documentation and semantic description of these initiatives, as proposed by the Réseau en Afrique Francophone pour la Télémédecine (RAFT) annotation model can help avoid redundant efforts and ensure that investments are directed towards impactful innovations.

According to Chatterjee et al. (2023), e-health has significantly enhanced healthcare delivery, particularly during the COVID-19 pandemic, by leveraging IT such as telemedicine, mHealth and Tele-health, along with wearable body sensors, AI algorithms and IoT devices for remote patient monitoring. Sinabell and Ammenwerth (2022) state that the usability of these systems is very crucial, and methods like remote user testing, expert review and rapid iterative testing and evaluation have been identified as effective for agile and cost-effective usability evaluations, ensuring these systems are user-friendly and can be quickly integrated into routine practice. According to Wong et al. (2020) e-Health has shown improvement in medication management, drug adherence and health outcomes through functionalities like caregiver communication, health monitoring, and reminders. Collectively, when there is continual consistency in implementation, usability, and long-term effectiveness, the potential of e-health routinisation to transform healthcare service delivery will be addressed and optimised.

Related Studies

According to Coiera and Hovenga's (2007) views, IT has emerged as a critical enabling tool globally to help achieve effective monitoring and management of service delivery; it can generate real-time information, facilitating swift decision-making and timely actions. It is anticipated that the successes achieved by IT in other sectors, such as banking and commerce, can be effectively replicated in the healthcare sector. E-Health guarantees that the appropriate health information systems (HIS) are delivered to the proper individual at the relevant time and location in a secure electronic format, enhancing the quality and efficiency of healthcare service delivery, research, education, and knowledge. To accomplish this, it is essential to disseminate information through patient registries, EHRs, and shared knowledge resources. These enhancements are anticipated to improve various aspects of healthcare service delivery, such as quality, cost-effectiveness, efficiency, access, timeliness, and overall performance. The overarching objective is to improve the efficiency and effectiveness of

patient care by facilitating easier retrieval and processing of clinical information across various providers, thereby rendering e-health operable.

According to Zhang et al. (2012), there are various benefits of IT solutions in healthcare; they include ease of access- simplifies access to health services and information, improved efficiency- enhances the efficiency of healthcare processes and workflows, improved quality of care- contributes to better patient care and outcomes, enhanced quality of information- improves the quality of charts, records, and reports, facilitation of management- supports better management of healthcare facilities and resources, enhanced communication- improves communication among healthcare providers and between providers and patients, cost savings- reduces costs through streamlined processes and reduced errors. These benefits demonstrate the significant positive impact of IT solutions on various aspects of healthcare.

Tian (2022) argues that the global status of e-health routinisation reveals a complex and evolving landscape characterised by significant advancements and persistent challenges. E-Health originated in the late 1990s and has become a multidisciplinary field encompassing telemedicine and other digital health technologies, with substantial contributions from medicine, engineering and computer science. Okpechi et al. (2022) add that the uptake of e-health varies widely across regions, with high-income countries demonstrating more comprehensive governance frameworks and higher availability of EHR and e-learning in medical schools compared to low-income countries.

Alverson (2020) is of the view that rapid population growth and the increasing prevalence of lifestyle-related diseases further stress the need for healthcare reform, with IT playing a critical role in achieving these goals by improving diagnosis times, patient access, decision-making and cost savings. However O'Connor and Heavin (2018) are of the view that penetration of e-health services is suboptimal, particularly in low-income regions, highlighting the need for increased utilisation of internet communication technologies to enhance access to healthcare education and services globally.

The status of e-health routinisation in Africa presents a mix of progress and ongoing challenges, and many African countries have acknowledged the significance of e-health, leading to the uptake and implementation of various policies and standards to enhance healthcare delivery. Mamuye et al. (2022) and Meseret et al. (2022) are of the view that there is still a need for more robust government support and regulatory frameworks to establish a sustainable national e-health environment; they continue to say that empirical evidence indicates the rapid expansion of e-health in low- and middle-income countries is often hindered by insufficient technical infrastructure and lack of systems thinking. Overall, in Africa, while progress has been made in e-health routinisation, ongoing efforts are necessary to overcome existing barriers and fully leverage the potential benefits of e-health.

The status of e-health routinisation in Kenya reveals a landscape marked by significant potential and notable challenges. Despite the rapid growth of IT in the country, e-health remains in its infancy, with various projects at different stages of implementation and evaluation. A systematic review identified 69 e-Health projects, predominantly mHealth initiatives, focusing on primary care and Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDs), but highlighted that only a few projects have been rigorously evaluated and scaled up, particularly in marginalised areas Shirandula et al. (2022). The Kenyan government has made strides in creating a conducive environment for e-health through policies and infrastructural support. Yet, challenges such as inadequate infrastructure, policy gaps and limited human capital development persist (Shirandula et al., 2022). The rapid penetration of mobile phone use and an entrepreneurial populace provide a fertile ground for e-health growth. Still, a lack of integration of health systems and consensus on data standards remains a significant barrier (Imbamba & Kimile, (2017). In the realm of e-learning, a component of e-health, public universities in Kenya are also at an early stage, with limited IT

infrastructure and a lack of standardised e-learning programs, further underscoring the broader challenges in the e-health sector. Overall, while the potential for e-Health in Kenya is enormous, driven by IT advancements and supportive policies, its routinisation is still hindered by infrastructural, policy and evaluative challenges that must be addressed to realise its benefits fully.

Methodology

This paper used a narrative literature review to explore determinants influencing e-health routinisation in healthcare facilities. A systematic search was conducted across multiple academic databases, including PubMed, Google Scholar, and JSTOR, using the key terms "eHealth," "routinisation," "Kenya," "healthcare facilities," "health information systems," and "digital health adoption." The review focused on peer-reviewed articles, reports, and relevant policy documents published between 2005 and 2023.

The following inclusion criteria were established to ensure the relevance and quality of sources. They focused on studies examining the implementation, uptake, and sustainability of e-health in healthcare facilities, particularly within the Kenyan context. Studies from other Sub-Saharan African countries with similar healthcare systems were also considered for comparative insights. Non-peer-reviewed articles, grey literature without substantial empirical backing, and studies not specifically addressing e-health system routinisation were excluded.

After an abstract and full-text review, 75 articles from an initial pool of 200 sources met the inclusion criteria. The data extracted from these studies included key variables such as the type of e-health, implementation strategies, barriers to adoption, facilitators of routinisation, and the role of healthcare providers and management.

A thematic analysis was conducted to identify recurring patterns, challenges, and successful strategies for integrating e-health into healthcare facilities as routine operations. Studies were critically appraised for their methodological rigour, sample size, and contextual relevance to Kenyan healthcare settings. The synthesis of findings focused on common themes such as technological infrastructure, user training, organisational culture, and policy support.

Results

Key determinants identified for e-health routinisation were user characteristics, technological availability, and organisational support. User characteristics are crucial because they influence how easily individuals adopt, use, and integrate these technologies into their daily lives through user engagement, positive attitude, active participation, and computer skills for successful uptake of e-health technologies.

Technological availability is another critical component, as is the importance of integrating and usability of the implemented systems. Facilities must ensure they invest in durable infrastructure, hardware, and reliable networking to support e-health initiatives and enable routine use of e-health to improve efficiency and effectiveness.

Organisational support is also integral, as it ensures that top management supports and backs up the use of e-health to influence the success of e-health uptake, implementation, and routinisation. Stakeholder engagement by emphasising the need for active involvement of healthcare professionals, patients, and technical providers in developing and implementing e-health. Additionally, investment in capacity building is vital for improving service delivery through training healthcare providers and upgrading IT infrastructure. Sufficient financial resources are necessary to meet the technological demands and sustainability of e-health and conduct a thorough needs assessment to allow organisations to tailor e-health solutions to specific requirements of their healthcare providers, which leads to enhancing efficiency, effectiveness and acceptance of these systems.

Discussion

The study findings showed that establishing consistent procedures and protocols for using e-health, such as EHRs and telemedicine platforms, is crucial for enhancing healthcare delivery and ensuring patient safety. Grguric et al. (2021) argue, despite the potential benefits, the uptake of e-health still faces challenges such as legal, technical complexity, inadequate IT infrastructure, resource limitation, and integration issues, which hinder consistency of data quality. Pineda Rincón and Moreno-Sandoval (2021) view that in developing countries, the rapid advancement of IT has significantly impacted healthcare. Still, the lack of standardised methods and structures for health data sharing remains a barrier. Mousavi et al. (2018) argue that the impact of e-health on clinical outcomes is mixed, with improvements in patient safety and communication between healthcare providers being contingent on the quality of e-health and automating routine administrative tasks, such as scheduling, billing, and lab results management, developing high-quality user-friendly systems, providing adequate training, encouraging integration between different e-Health, conducting regular audits of system usage and performance to identify bottlenecks or underused features, addressing privacy and security concerns, and reducing user resistance improves e-health routinisation. Grguric et al. (2021) believe that e-health is critical and needs to be adopted and used daily to improve the quality of service delivery in healthcare facilities. By following these guidelines and leveraging standardised protocols, healthcare providers can better utilise e-health technologies to improve patient care and outcomes, reduce clinician burden, and increase operational efficiency, leading to more efficient and effective healthcare delivery. A robust IT infrastructure is essential to support e-Health and is a vital factor in the successful implementation and routinisation of these systems (Boore et al., 2017). Without key components like network connectivity with high-speed internet, storage, reliable hardware, backups and up-to-date software, the routinisation of e-Health may be unsuccessful.

Comprehensive and continuous training programs for healthcare providers are crucial for the digital transformation of healthcare by ensuring proficiency in using e-health and understanding its benefits and limitations. The COVID-19 pandemic accelerated the uptake of digital health solutions, highlighting the need for healthcare professionals to acquire digital competencies to utilise these technologies effectively (Alenoghena et al., 2022). Training programs should encompass a broad range of digital health tools, including telemedicine and digital medicine, as demonstrated by the Erasmus+ project, significantly enhancing participants' understanding and confidence in using digital tools (Kovačić et al., 2022). Additionally, integrating digital health education into healthcare curricula is essential, as current programs often limit digital health to specific modules, failing to provide a comprehensive approach (Nourimand et al., 2022). This gap underscores the need for ongoing training to enhance digital health literacy among healthcare professionals (Kovačić et al., 2022). Furthermore, adopting a "digital determinants of health" framework can systematically help to incorporate digital health competencies into medical education, ensuring that healthcare providers are well-equipped to navigate the intersections of health outcomes and health technology (Nourimand et al., 2022). By addressing these educational needs, healthcare providers can better leverage e-Health to improve patient care and healthcare delivery.

Positive experiences with digital tools, such as feeling confident and satisfied, are reinforced by sufficient training and adequate workflow integration. In contrast, negative experiences, such as frustration and feeling overwhelmed, are often due to unfavourable social structures and lack of training (Bergua & Bouisson, 2008). Seamlessly incorporating e-health tools into existing clinical and administrative workflows is crucial for minimising disruptions and enhancing efficiency in healthcare settings. This integration requires a multifaceted approach that includes friendly user interface design and alignment with the natural workflow of healthcare providers. To be effective, digital health tools, such as clinical decision support systems and EHRs, must be functionally integrated into existing

routines. This involves the quality of the algorithms and the usability of the tools in practice, which is as important as the algorithm quality itself (Nourimand et al., 2022). The digitisation of medical health records has improved operational efficiency by enhancing access to patient information, streamlining workflows, reducing documentation errors, and improving communication among healthcare stakeholders (Sevic et al., 2023). Therefore, a holistic approach that includes system-level evaluation, user-friendly design, and adequate training is essential for a successful e-health routinisation into clinical workflows.

Developing and implementing policies and procedures to support the routine use of e-health is crucial for enhancing healthcare delivery (Goh et al., 2011). A coherent strategy is essential, as highlighted by stakeholders from Austria, Switzerland, and Germany, who emphasised the importance of a consistent e-health strategy, consensus-building, and implementation for practical use in patient care (Bergua & Bouisson, 2008). In Indonesia, the rapid uptake of telehealth during the COVID-19 pandemic has underscored the need for robust policies that ensure organisational support, equity, and legal backing. Furthermore, the systematic use of Routine Health Information Systems (RHIS) data is vital for planning, monitoring, and supportive supervision at district and facility levels. However, there are significant gaps in the practical application of RHIS data for these purposes (Sinabell & Ammenwerth, 2022). To address this, institutionalise procedures that link existing district plans to regular monitoring of priority programs by making managers accountable for monitoring and supervising these plans and develop practical guidelines for using RHIS data effectively (Chatterjee et al., 2023; Cruz-Martínez et al., 2019) with clear guidelines for data entry, privacy, and security protocols to protect patient information and ensure the integrity of the data. By integrating these elements, healthcare systems can better leverage e-health technologies to improve service delivery and patient outcomes.

Management support is critical to ensuring that e-Health is well-integrated with other organisational processes or routines to achieve overall coherence and alignment with organisational objectives. Managing the cultural and organisational changes required to adopt e-health is a multilayered challenge that necessitates a strategic approach to engage stakeholders to address resistance and demonstrate the value of these technologies in enhancing patient care (Nurmaidah et al., 2024). A firm commitment from leadership to e-health initiatives ensures appropriate resource allocation, encourages employee engagement, and aids in resolving challenges during implementation, thus helping to reduce resistance and discomfort, integrate the system with clinical processes, and build solid organisational commitment through effective communication and ongoing support (Su et al., 2023). Repetition helps build habits, which are fundamental to e-health routinisation. When healthcare providers use these systems more often, it becomes part of their daily routine and becomes automatic, making using the system second nature, leading to efficiency and consistency.

Conclusion

While e-health offers significant benefits, such as improved efficiency and data management, their uptake is hampered by insufficient infrastructure, organisational support, user characteristics, and resistance to change among users. To enhance the successful uptake of these systems, there is a need for continuous training, better infrastructure, strategies to mitigate resistance and organisational backing up. Implementing these measures will not only improve the efficiency of healthcare service delivery but also ensure the sustainability of e-health usage influenced by standardisation of processes, training and education, workflow integration, policy and procedure development, change management, performance monitoring and evaluation, sustainability planning, integration and repetition of processes. While significant progress has been made, e-health routinisation requires continued efforts in policy development, infrastructure enhancement, and international collaboration to overcome existing disparities and fully integrate digital health solutions into routine healthcare

practices. This review provides a comprehensive understanding of e-health routinisation in Kenyan public healthcare facilities, identifying key factors influencing long-term uptake and highlighting areas for future research and policy interventions. Future studies should focus on conducting longitudinal studies to observe the long-term integration of e-health, comparing the factors influencing e-health uptake in different counties or countries to identify commonalities and region-specific challenges.

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