Advancing Digital Health Literacy: Integrating Public Health, Educational Strategies and Technological Innovations for Equitable Access and Empowerment

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ABSTRACT

With the speed of healthcare services becoming digitalized grows, digital health literacy (DHL) becomes one of the essential 21st century skills. As health systems increasingly turn to online health information platforms, people will need to be equipped with knowledge and capabilities of using online health information and how they can use the knowledge to the advantage of the health system. In this paper, we talk about the opportunity to achieve the promotion of DHL at the meeting of three topics education, technological progress, and health. It cites the representational barriers to equitable accessibility, proposes an integrative model and highlights the need of community-based, culturally acceptable, inclusive digital health literacy programmes. This paper contributes to the population empowerment to make significant contribution to their health and well-being on the digital age with the multidimensional lens. Overall, the results imply that while all components are important,

participants place greater emphasis on the ability to critically evaluate and interpret media messages, a skill central to navigating today's digital health environments.

KEYWORDS

Digital Health Literacy, Public Health. Health Education, Technological Innovation, Health Equity, Digital Inclusion, Empowerment and Health Communication

INTRODUCTION

Increasing use of digital health solutions and the burden on underpaid workforce in the United States, in general, and healthcare, in particular (in terms of electronic medical records and telemedicine, as well as health apps, online symptom checkers, etc.), requires people to have a high level of digital health literacy. This became all the more relevant during the COVID-19 pandemic because digital tools emerged as one of the key ways of obtaining health information and services. Millions of people are still digitally disenfranchised, mostly in underserved communities or developing nations. Therefore, ensuring equal access to the digital health environment is not only a matter of technology but an ethical call that needs the partnership of the various sectors of society, including the sphere of public health, and digital learning.

DIGITAL HEALTH LITERACY (DHL)

Digital health literacy extends beyond basic digital literacy. It encompasses the ability to seek, find, understand, and appraise health information from digital sources and apply the knowledge to address or solve health problems. The European Commission defines DHL as "the ability to use electronic tools to gain access to and apply health information for personal and community health enhancement."

KEY COMPONENTS OF DHL

Information Literacy : The concept of information literacy deals with the process of recognizing, finding, assessing, and using information in the best way possible in solving a problem or making a decision. Regarding the digital health sphere, it allows people to cope with the huge amount of health information they can find on the Internet and identify the trustworthy sources among unreliable ones. This competency helps one make wise decisions regarding health behaviors or preventive care or medication. Information literacy is the idea of knowing how to use search engines and what credible domains look like (e.g., .gov, .edu, .org), what authorship means, and evidence-based materials. Since health misinformation, in particular, is proliferated at an alarming rate via online spaces, especially, in case of emergencies, such as the COVID-19 pandemic, information literacy improvement becomes a crucial public health goal. In its absence, individuals are prone to experience the attack by health myths, pseudo remedies, or any other dangerous recommendations. Educational programmes in the schools, libraries, and mass campaigns on information literacy can become a starting point on the way towards digital health literacy and enable individuals to control their own well-being with confidence and with a critical approach.

Computer Literacy : Computer literacy- Computer lit is the thing that is needed to know how to use computers and digital devices in the best way. It entails learning the basic functions of hardware and software, manipulating operating systems and using internet browsers, common applications such as word processors, spreadsheets and email. Computer literacy, in digital health, gives the health

consumers access to electronic health records, consult online, use and install health app, and connect with health providers through online platforms. It is a condition of using the majority of digital health tools and services. The issue is that the lack of computer literacy might also result in people being unable to maintain their personal health, at least when more systems are migrated to digital forms. However, because they have no exposure or training, elderly people, rural people, and people with minimal formal education, are very poor in this area. Computer literacy among underserved populations is needed and can be attained through community workshops, mobile training units, and inclusive education programs to reduce digital inequalities and advance health outcomes in underserved populations.

Media Literacy : Media literacy refers to the power to critique, analyze evaluate and produce messages in all media. This skill is necessary in the digital health environment to ensure that the health information is made available using websites, news, and social media outlets as well as in advertisements. Media literacy teaches people to ask the question of what is behind the content, the difference between opinion and evidence, bias/manipulation, mis- or disinformation. Now, an individual with being a highly media-literate person will be able to identify clickbaits, separation of fake medical ads, and evaluate whether that health supplement being marketed has been supported by solid research or through an affirmative influence by some internet celebrity who wants to sell the product. Regarding viral content and feeds created with the algorithm in mind, media literacy can be used to guard people against getting deceived by pseudoscience or conspiracy theories. The youth should be taught to be media literate at a young age particularly assessing media about health. This will make sure that people become justified digital citizens who know how to navigate the information-laden world without breaching it.

Health Literacy: Health literacy is the ability to access, understand, appraise, and apply health information to make informed health-related decisions. It includes understanding medical terms, navigating healthcare systems, following prescriptions, interpreting test results, and knowing when and where to seek help. Strong health literacy enables individuals to manage chronic diseases, follow preventive health measures, and communicate effectively with healthcare providers. In the digital age, health literacy also involves interpreting online health content, using symptom checkers or patient portals, and understanding the risks and benefits of treatments. Low health literacy can result in medication errors, poor self-management of illness, increased hospitalization, and overall worse health outcomes. It disproportionately affects older adults, people with lower education levels, and non-native language speakers. Therefore, improving health literacy through simplified communication, visual aids, culturally appropriate content, and inclusive health education is essential. Enhancing this capacity ultimately leads to more empowered patients and more effective public health interventions

Public Health Imperative: From a public health perspective, DHL plays a crucial role in promoting health equity. It supports informed decision-making, enhances disease prevention strategies, and helps bridge healthcare disparities. Populations with low DHL are more susceptible to misinformation, delayed care, and poorer health outcomes.

POPULATIONS AT RISK OF LOW DHL:

Public health systems must prioritize digital inclusion by ensuring all populations have access to digital tools and the competencies to use them. Equipping citizens with DHL also aligns with the

United Nations Sustainable Development Goals (SDGs), particularly Goal 3 (Good Health and Well-being) and Goal 10 (Reduced Inequalities).

Older Adults : Older adults often face significant barriers to digital health literacy due to age-related changes in cognition, vision, hearing, and motor skills. Many did not grow up using digital technologies and may lack confidence or familiarity with smart phones, computers, or health apps. They may struggle with navigating telemedicine platforms, using patient portals, or identifying credible health information online. Additionally, concerns about data privacy and fear of making mistakes can discourage them from engaging with digital tools. This puts them at risk of missing out on essential healthcare services, especially during times when in-person care is limited, such as during the COVID-19 pandemic. Tailored interventions—such as simplified user interfaces, in-person or peer-led training, and age-friendly tech design—are crucial for bridging this gap. Programs should emphasize hands-on learning, patience, and relevance to everyday health needs to empower older adults and promote independent health management in the digital era.

People with Low Socioeconomic Status : Individuals with low socioeconomic status (SES) often face compounded challenges in accessing and using digital health resources. Limited financial means may restrict their access to smart phones, internet connectivity, or computers. Moreover, many may lack digital or educational support, making it difficult to navigate complex health systems or evaluate online health information. Time constraints due to multiple jobs, stress, or care giving responsibilities further hinder their ability to engage in digital health literacy programs. These barriers can result in poor health outcomes, lower health-seeking behavior, and increased vulnerability to misinformation. Addressing these disparities requires targeted community outreach, free or subsidized digital tools, public access to internet services (e.g., at libraries or community centers), and culturally relevant content. Interventions should also consider social determinants of health and provide supportive environments that empower low-SES populations to access and act upon accurate digital health information effectively.

Rural and Indigenous Communities : Rural and indigenous communities frequently experience digital health inequities due to geographic isolation, limited healthcare infrastructure, and insufficient digital connectivity. Internet access in these areas is often slow, unreliable, or entirely absent, severely hindering the ability to use digital health tools like telemedicine or online health portals. Cultural and linguistic diversity can also limit the accessibility and relevance of mainstream digital health content. Additionally, historical marginalization may lead to mistrust in digital platforms, especially those tied to government or commercial health providers. Indigenous knowledge systems and community-centered approaches are often overlooked in digital health design, creating disconnects between available services and community needs. To address these challenges, interventions should be co-developed with community leaders, use localized languages and culturally respectful frameworks, and invest in digital infrastructure. Empowering local health workers and educators as digital literacy facilitators can further enhance trust and sustainable engagement with digital health tools.

Non-Native Language Speakers : Non-native language speakers face significant challenges in navigating digital health environments where content is often only available in dominant languages. This language barrier can prevent them from understanding medical instructions, deciphering technical terminology, or effectively communicating with healthcare providers online. Even when translations exist, they may be poorly done or lack cultural nuance, leading to confusion and potential health risks. Misinterpretation of health advice can result in misuse of medication, missed diagnoses, or delays in seeking care. These populations may also face discrimination or fear of engaging with systems they perceive as unwelcoming. To bridge this gap, it is essential to offer multilingual digital

health resources, ensure accurate and culturally appropriate translations, and include visual aids or voice-based tools. Training bilingual healthcare workers or community translators in digital tools can further support these populations. Culturally inclusive, language-sensitive strategies are vital for promoting digital health literacy and equity among diverse linguistic groups.

INDIVIDUALS WITH LIMITED FORMAL EDUCATION

People with limited formal education often struggle with both functional and digital health literacy. Basic skills like reading, writing, and numeracy are foundational for understanding health content, filling out forms, or following digital prompts in health applications. These individuals may feel overwhelmed by complex medical language, unfamiliar digital interfaces, or the abundance of online health information. This makes them especially vulnerable to misinformation and may discourage them from seeking digital health services altogether. Furthermore, embarrassment or fear of judgment can prevent them from asking for help. Effective strategies to support this group include simplifying language, using infographics or video content, and adopting interactive, hands-on learning approaches. Community-based training programs, peer educators, and health literacy workshops tailored to different learning levels can significantly improve their digital engagement. By focusing on clear communication and supportive environments, we can empower individuals with limited education to participate confidently in their own healthcare in the digital age.

EDUCATIONAL STRATEGIES TO ENHANCE DHL

Education systems are instrumental in cultivating DHL from a young age. Schools, universities, adult education programs, and vocational training centers serve as critical platforms for embedding DHL across the curriculum.

Critical Thinking and Media Literacy : Critical thinking and media literacy are essential in today's digital landscape, where vast amounts of health information—both accurate and misleading—circulate rapidly online. Critical thinking involves analyzing information logically, evaluating sources, questioning assumptions, and making reasoned judgments. When paired with media literacy—the ability to understand, interpret, and critique media messages—individuals become empowered to detect misinformation, disinformation, and biased reporting. In digital health, this means being able to differentiate evidence-based health guidance from conspiracy theories or commercialized pseudoscience. For example, someone with strong media literacy skills can identify fake health news on social media, spot sponsored content, and understand how algorithms influence what health content they see. Developing these skills is particularly urgent in a post-pandemic world, where misinformation has led to vaccine hesitancy and harmful health behaviors. Integrating critical thinking and media literacy into school curricula, adult education, and community programs is crucial for fostering informed, autonomous health decision-making.

Technological Innovations and Digital Health Literacy (DHL) : Technological innovations are transforming how health information is delivered and accessed, offering new opportunities to enhance Digital Health Literacy (DHL). Tools such as mobile health apps, telemedicine platforms, wearable devices, and AI-powered chat bots enable individuals to monitor health, consult doctors, and access medical knowledge from anywhere. These innovations make healthcare more accessible, especially in remote or underserved areas. For example, voice-activated health assistants and symptom checkers can guide users through medical inquiries, while fitness wearables help track vital

signs and promote preventive care. However, the effectiveness of these tools depends on users' ability to understand and use them correctly—hence the importance of DHL. If not designed inclusively, advanced technologies may widen health disparities. To truly benefit diverse populations, innovations must be paired with education, infrastructure, and equitable access strategies. When used responsibly, technology can be a powerful driver of DHL, enabling more people to take control of their health in informed ways.

User-Centered Design : User-centered design (UCD) is a human-focused approach to developing digital tools that prioritizes the needs, preferences, and limitations of end users. In digital health literacy, UCD is critical for creating accessible, inclusive, and effective health technologies. Instead of designing tools based solely on technical capabilities, UCD involves engaging users—especially those from marginalized or low-literacy backgrounds—throughout the design process. This includes testing interfaces for clarity, ensuring content is understandable, and adapting functions for different languages, ages, and abilities. For example, a tele health app designed using UCD principles might feature large icons, voice instructions, and simple navigation to accommodate older adults or users with limited literacy. It may also consider cultural relevance and local health practices. UCD ensures that digital health innovations are not only technologically advanced but also usable and meaningful to the people who need them most. Ultimately, it bridges the gap between innovation and impact by making digital health solutions truly accessible.

Developers must create health technologies that are accessible, intuitive, and inclusive. Key principles include:

Language Accessibility : Language accessibility ensures that digital health tools are available in the languages users speak and understand. Many health platforms are only available in dominant global languages like English, leaving non-native speakers or linguistically diverse populations at a disadvantage. Without language-appropriate content, users may misinterpret medical instructions or avoid digital services altogether. Ensuring language accessibility involves providing clear, accurate translations, using plain language, and avoiding medical jargon. It also includes offering localized content that reflects cultural nuances and regional terminology. For example, a diabetes management app for rural India should include content in local languages like Hindi or Tamil, not just English. Multilingual voiceovers and subtitles can further support comprehension. By prioritizing language accessibility, developers ensure that users from all backgrounds can engage meaningfully with digital health resources, make informed decisions, and feel respected and included—an essential step toward equitable healthcare access and improved health outcomes across diverse populations.

Low Literacy Modes: Low literacy modes are design features that help users with limited reading or digital skills navigate digital health platforms effectively. These modes include voice guidance, pictograms, audio-visual tutorials, and simple icon-based navigation systems. Instead of relying on text-heavy content, such tools use universally understandable symbols, spoken instructions, and animations to convey health information. For example, a maternal health app could guide users through prenatal checklists using illustrated steps and spoken messages in local dialects. This approach benefits users who are illiterate, semi-literate, or unfamiliar with medical terminology. It also supports those with cognitive disabilities or learning challenges. By simplifying content and reducing reliance on text, low literacy modes ensure that essential health information is accessible to all, regardless of educational background. Such inclusive design fosters engagement, reduces user anxiety, and empowers individuals to make health decisions with confidence—even if they lack traditional literacy skills.

Offline Capabilities : Offline capabilities allow digital health tools to function without continuous internet access—crucial in areas with poor connectivity or high data costs. Many rural or economically disadvantaged users lack stable internet infrastructure, which limits their ability to access digital health services. By incorporating offline functionality, such as downloadable educational content, symptom checklists, or appointment reminders, health apps can ensure uninterrupted service regardless of connectivity. For instance, a mobile app designed for community health workers might store patient records locally and sync updates only when internet becomes available. Offline modes are especially beneficial during emergencies, remote medical outreach, or in resource-constrained environments. These features help bridge the digital divide and ensure equitable access to health information. Moreover, they reduce dependency on real-time networks, making healthcare tools more reliable and inclusive. Prioritizing offline capabilities in digital health design enables broader reach and more consistent user engagement across diverse geographic and socioeconomic contexts.

Multilingual Interfaces : Multilingual interfaces allow users to select and interact with digital health platforms in their preferred language. Unlike basic translation, a true multilingual interface provides seamless language switching for menus, instructions, notifications, and user inputs—without compromising meaning or functionality. This feature is essential in multicultural societies, where multiple languages coexist, and especially important for migrants, indigenous communities, and non-native language speakers. For example, a vaccine reminder app with interface options in English, Swahili, and French enables broader participation in sub-Saharan Africa. Multilingual design also improves trust, user satisfaction, and comprehension, reducing the risk of medical misunderstanding. Effective implementation involves professional translation, cultural adaptation, and regular feedback from native speakers. Ideally, users should be able to set their language during on boarding and switch easily when needed. Multilingual interfaces enhance digital health literacy by respecting linguistic diversity and empowering users to access, understand, and manage their health in a language they feel comfortable with.

DISABILITY-FRIENDLY DESIGN (E.G., SCREEN READERS, VOICE COMMANDS) (150 WORDS)

Disability-friendly design ensures that digital health platforms are accessible to users with physical, sensory, or cognitive impairments. Features such as screen reader compatibility, voice command functions, adjustable font sizes, high-contrast visuals, and captioned videos make digital tools usable by people with disabilities. For example, a screen reader reads aloud app content for visually impaired users, while voice navigation allows those with limited motor skills to operate devices hands-free. Such design must follow global accessibility standards like the Web Content Accessibility Guidelines (WCAG) and should be tested with real users with disabilities. Inclusive design is not just a legal or ethical obligation—it enhances usability for all. When health platforms are designed with disability access in mind, more people can manage their health independently and effectively. By removing physical and sensory barriers, disability-friendly design promotes digital inclusion, safeguards human rights, and ensures that digital health technologies truly serve everyone.

MOBILE HEALTH (M-HEALTH) TOOLS

Mobile phones have revolutionized access to health information in low-resource settings. M-Health apps can:

Send Vaccination Reminders : One of the most impactful uses of mobile health (m-Health) tools is sending vaccination reminders. These reminders—delivered via SMS, app notifications, or voice messages—help ensure timely immunizations for children and adults. This is especially valuable in rural or underserved areas where access to health facilities and printed health records may be limited. Reminders can include appointment dates, vaccine names, dosage information, and post-vaccination care tips. Programs like India's *eVIN* and South Africa's *MomConnect* have effectively used this approach to improve immunization rates. Personalized reminders not only reduce missed doses but also increase awareness about vaccine-preventable diseases. When combined with educational content, they can address vaccine hesitancy and build trust in public health programs. For populations with low digital literacy, reminders should be short, clear, and in local languages. This functionality empowers individuals and caregivers to take proactive steps in preventive healthcare and supports national immunization goals.

Provide Maternal Health Guidance : m-Health tools play a critical role in supporting maternal health by providing timely, accessible guidance throughout pregnancy, childbirth, and postpartum stages. These tools offer educational content on topics like prenatal nutrition, warning signs, labor preparation, newborn care, breastfeeding, and immunizations. Interactive features such as weekly pregnancy updates, due date calculators, and symptom checkers personalize the experience and foster engagement. Programs like *MomConnect* in South Africa and *Kilkari* in India send voice and text messages to expectant mothers in regional languages, offering medically approved advice aligned with the gestational timeline. These platforms bridge gaps in access to skilled healthcare, especially in rural or resource-limited settings. They also encourage regular antenatal checkups and promote institutional deliveries. When paired with community health workers or digital support lines, maternal health apps can reduce maternal and infant mortality rates by empowering women with knowledge, confidence, and tools for safe and informed healthcare decisions.

Offer Mental Health Self-Care Tools : Digital platforms increasingly offer mental health self-care tools to support emotional well-being, reduce stress, and manage conditions like anxiety or depression. These tools include mood trackers, guided meditation, cognitive behavioral therapy (CBT) exercises, journaling features, breathing techniques, and AI-driven chatbots that provide 24/7 emotional support. Apps like *Wysa*, *Calm*, and *Headspace* are widely used to provide affordable, stigma-free mental health support in private and convenient formats. For users in areas with limited access to mental health professionals, such tools offer a valuable alternative or complement to traditional care. Many platforms offer customizable programs based on user inputs and progress tracking. To ensure inclusivity, self-care tools should feature language options, offline use, and culturally relevant content. By fostering self-awareness and resilience, these tools help users better manage mental health challenges, reduce feelings of isolation, and build consistent self-care habits— making mental health support more accessible and personalized than ever before.

Enable Chronic Disease Management : Digital health tools significantly enhance chronic disease management by enabling continuous monitoring, personalized reminders, and patient-provider communication. Mobile apps and wearable devices help patients manage conditions like diabetes, hypertension, asthma, and heart disease by tracking symptoms, medication adherence, diet, physical activity, and vital signs. Features such as glucose logging, blood pressure tracking, and pill reminders ensure consistency and reduce the risk of complications. Some platforms offer integration with electronic health records, allowing healthcare providers to remotely monitor patients and intervene when needed. For example, a diabetes app may alert a doctor if glucose levels fluctuate dangerously, prompting a timely response. Educational modules within these apps teach patients how to manage

their conditions, recognize warning signs, and adopt healthier behaviors. When designed to be user-friendly and accessible, these tools empower patients to take control of their long-term health, reduce hospital visits, and improve overall quality of life, particularly in low-resource or remote areas.

Digital Divide : The digital divide refers to the gap between individuals or communities who have access to digital technologies and those who do not. This divide affects access to devices (like smart phones or computers), reliable internet, digital skills, and health-related content. In low-income, rural, or underserved regions, poor infrastructure and high costs limit access to online health services. Even in urban areas, marginalized populations may lack the digital literacy required to engage with telemedicine, health apps, or patient portals. The digital divide is a significant barrier to equitable healthcare, as it prevents many from receiving timely information, making informed health decisions, or participating in virtual care. Addressing the divide requires investment in infrastructure, affordable data plans, device access programs, and digital literacy training. Bridging this gap is crucial to ensure that all populations—not just the digitally privileged—can benefit from advancements in digital health technologies and services.

Language and Cultural Barriers : Language and cultural barriers significantly hinder digital health literacy, especially in multilingual and diverse societies. Many digital health platforms are available only in dominant languages, excluding users who speak local or indigenous languages. Even when translated, content may lack cultural relevance or misrepresent health beliefs, reducing trust and understanding. Cultural norms around gender roles, health practices, or communication styles can further impact how users interpret digital health information. For example, a health app promoting Western dietary advice may not align with local food traditions, leading to confusion or disengagement. To overcome these barriers, developers must localize content—adapting not just language but also imagery, examples, and delivery methods to resonate with users' cultural contexts. Co-creation with local communities and health workers can enhance cultural sensitivity. Ensuring linguistic and cultural inclusivity in digital health tools fosters better understanding, trust, and engagement, especially among historically marginalized or underserved populations.

Trust and Privacy Concerns : Trust and privacy concerns are major obstacles to the adoption of digital health tools. Many users—especially older adults, minority communities, or those with past negative experiences—are wary of sharing personal health information online. Concerns include data breaches, unauthorized surveillance, identity theft, or misuse of sensitive medical records by governments or corporations. A lack of transparency about how data is collected, stored, and used further erodes confidence. Trust also extends to the credibility of online health information; users may question whether digital content is reliable, accurate, or influenced by commercial interests. To address these concerns, platforms must adopt strong data protection policies, use encryption, obtain informed consent, and communicate clearly about privacy practices. Building trust also involves partnering with community organizations, healthcare providers, and culturally competent facilitators to promote digital tools. When users feel their rights and dignity are respected, they are more likely to engage with digital health resources confidently.

Gender Disparities: Gender disparities significantly impact digital health literacy, especially in regions where women and girls have limited access to education, technology, or decision-making power. In many cultures, men are prioritized in digital ownership, internet usage, or health communication, leaving women digitally excluded. Societal norms may restrict women's ability to attend digital training, access mobile phones, or engage in online health forums. Additionally, digital health content often overlooks gender-specific health concerns or lacks inclusive language, further alienating female and gender-diverse users. These disparities can lead to poorer health outcomes,

especially in maternal health, reproductive rights, and mental well-being. Closing the gender gap requires targeted interventions: gender-sensitive content, digital literacy programs for women, access to affordable devices, and safe online spaces. Empowering women with digital health skills improves not only their individual health but also the well-being of families and communities, reinforcing the importance of gender equity in all digital health strategies.

POLICY FRAMEWORKS

Universal Internet Access Goals : Universal internet access is a foundational requirement for promoting digital health literacy and ensuring equitable participation in the digital health ecosystem. Millions of people, particularly in rural, remote, and low-income areas, still lack reliable or affordable internet connectivity. Without access, they are unable to benefit from telemedicine, online health education, or mobile health apps. Universal access goals, often set by national governments or international agencies, aim to bridge this connectivity gap through public-private partnerships, investment in broadband infrastructure, and expansion of mobile network coverage. Programs such as free Wi-Fi in public spaces, community internet hubs, or low-cost mobile data plans are examples of inclusive approaches. Achieving universal internet access is not just a technical objective but a public health necessity. It lays the groundwork for all other digital health initiatives, enabling vulnerable populations to access timely, accurate health information and participate in modern healthcare systems with greater autonomy and confidence.

Subsidies for Digital Devices : Access to smart phones, tablets, or computers is a prerequisite for engaging with digital health services. However, the cost of these devices can be a significant barrier, particularly for low-income families, the elderly, and marginalized communities. Providing subsidies or financial assistance for digital devices helps level the playing field and promotes digital inclusion. Governments, NGOs, and private sector partners can offer subsidized or donated devices through health insurance schemes, welfare programs, schools, or community health projects. Some initiatives also include pre-installed health apps or offline health content. For instance, providing expectant mothers in rural areas with basic smart phones loaded with maternal health tools can directly impact health outcomes. Importantly, device subsidies should be paired with user support and training to maximize impact. By ensuring that digital access is not determined by financial status, subsidies for devices contribute significantly to narrowing the digital divide and advancing health equity through technology.

Digital Health Training for Healthcare Workers : Healthcare workers play a crucial role in bridging the gap between digital technologies and community health outcomes. Training them in digital health literacy enables them to effectively use electronic health records, telemedicine platforms, mobile health apps, and data analytics tools. More importantly, it equips them to educate and support patients in navigating digital health tools confidently and safely. Digital training should be embedded in both pre-service education and ongoing professional development, with modules on data privacy, digital communication skills, and health misinformation management. Frontline workers, including community health workers and nurses, especially in rural and underserved areas, should be prioritized. When healthcare professionals are digitally competent, they can serve as trusted intermediaries, helping patients adopt new technologies and overcome fear or confusion. This not only strengthens healthcare delivery but also fosters public trust in digital health systems, ensuring smoother integration of innovations into everyday health practices.

Community-Based Digital Literacy Campaigns : Community-based digital literacy campaigns are vital for reaching populations that formal systems often overlook, such as the elderly, women in rural areas, indigenous groups, and people with limited education. These campaigns are typically led by local organizations, libraries, NGOs, or trained community health workers, using culturally relevant and accessible teaching methods. They provide hands-on instruction in using digital devices, accessing trustworthy health websites, navigating health apps, and practicing online safety. Training is often delivered in local languages and through peer educators who understand the community's context and needs. Workshops may also integrate health education, showing people how to use digital tools for booking appointments, receiving vaccine alerts, or managing chronic illnesses. By meeting people where they are — both geographically and socially — these campaigns help build digital confidence, foster empowerment, and ensure no one is left behind in the digital health revolution. Ultimately, they play a crucial role in promoting health equity at the grassroots level.

ANALYSIS, FINDINGS AND RESULTS

In the evolving landscape of healthcare, digital health literacy has emerged as a vital competency for individuals to effectively navigate, interpret, and utilize digital tools and resources for health-related decision-making. It encompasses a range of literacies — media, computer, information, and health literacy — that collectively empower individuals to engage meaningfully with digital health technologies. The present analysis aims to assess the relative importance of these components based on participants' opinions, using mean values and standard deviations along with a Friedman test to determine statistically significant differences. The findings suggest that media literacy holds the highest mean rank, indicating its perceived prominence in digital health literacy, followed by computer, information, and health literacy. These insights are crucial for policymakers, educators, and healthcare providers aiming to design targeted interventions for enhancing digital health competency in the population.

Mean ranks of opinion about Components of Digital Health Literacy

Along with Friedman test result

Components	N	Mean	SD	Mean Rank	χ^2 value	P value
Media Literacy	150	2.31	1.129	3.93		
Computer Literacy	150	2.29	1.157	3.61	79.187	0.000
Information Literacy	150	2.46	0.987	3.52		
Health Literacy	150	2.53	1.015	3.43		

The Friedman test was conducted to compare the respondents' opinions on the different components of digital health literacy — Media Literacy, Computer Literacy, Information Literacy, and Health Literacy. The test revealed a statistically significant difference in the mean ranks of these components (χ^2 = 79.187, p = 0.000), indicating that participants do not view all components equally. Among the four components, **Media Literacy** received the highest mean rank (3.93), suggesting it is perceived as the most important or relevant in the context of digital health literacy. This is followed by **Computer Literacy** (mean rank = 3.61), **Information Literacy** (3.52), and **Health Literacy** (3.43), which received the lowest rank. The differences in mean scores also support this trend, with Media Literacy having

the lowest mean value (2.31), indicating stronger agreement or higher perceived proficiency. Overall, the results imply that while all components are important, participants place greater emphasis on the ability to critically evaluate and interpret media messages, a skill central to navigating today's digital health environments.

CONCLUSION

Digital health literacy is a cornerstone of equitable healthcare in the digital age. As health information and services increasingly migrate online, ensuring that all individuals—regardless of age, gender, income, education, or geography—can access and utilize digital health resources is both a public health mandate and a social justice issue. By integrating public health imperatives, educational strategies, and technological innovations, societies can foster resilient, informed populations capable of taking charge of their health. The path forward requires inclusive policies, sustained collaboration, and the recognition that DHL is not a luxury, but a necessity for empowered living. Communities must be engaged not as passive recipients but as co-creators of digital health initiatives. Participatory design—where community members shape the tools, language, visuals, and delivery of DHL programs—ensures relevance and sustainability. Women's self-help groups, youth clubs, and patient advocacy organizations can be powerful partners in this effort.

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