

Study of Digital Platforms in Primary Healthcare and Competencies for Better Healthcare Services

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Abstract: Digital platforms are revolutionizing primary healthcare delivery in the fast changing healthcare landscape. This study examines how digital platforms affect primary healthcare and what skills providers need to use them. Mixed-methods research combines quantitative study of digital platform usage statistics with qualitative insights from healthcare professionals and patients. The main goals are to examine the presence and types of digital platforms used in primary healthcare, evaluate their usefulness in improving patient outcomes, and determine the critical competencies needed to use these platforms effectively. Electronic health records, telemedicine platforms, and health-related mobile apps are analyzed in the quantitative phase. Digital platforms' impact on primary healthcare will be measured by patient involvement, health outcomes, and service delivery efficiency. Interviews and focus groups with healthcare practitioners, administrators, and patients comprise the qualitative phase. Digital platform usage, problems, and benefits will be discussed. The competencies healthcare practitioners need to use these platforms efficiently will also be studied. Digital platforms improve primary healthcare accessibility, efficiency, and patient involvement, according to preliminary research. However, data security, interoperability, and the digital divide must be addressed. Healthcare providers need digital literacy, virtual communication, data interpretation, and technology adaptation. This study affects healthcare policy, education, and practice. Understanding the skills needed to use digital platforms in primary care can drive training programs and help governments build supportive infrastructure. This research advances the seamless integration of digital technologies into primary healthcare to ensure high-quality, patient-centered treatment.

Keywords: Primary Healthcare, Digital Platforms, Healthcare, Virtual Communication, Patients, Healthcare Professional, Telemedicine, Mobile Application, Security and Safety,

1. Introduction

People in a country can enhance their health and quality of life by using healthcare resources better. It includes several medical, preventative, diagnostic, and rehabilitative treatments to maintain and restore health. Quality healthcare services affect many aspects of society, including individual well-being, labour force efficiency, economic security, and social institution growth (Kehr, J., Muinde, J. V. S., & Prince, R. J., 2023). Here are some of the main reasons a nation needs healthcare:

Individual Wellness: High-quality, easy-to-use healthcare improves health and quality of life. Regular checkups, preventative care, early diagnosis, and appropriate treatments prevent disease, manage chronic conditions, and improve well-being.

Workforce Productivity: A healthy population boosts workplace productivity. People with access to healthcare can address health issues as soon as they develop, limiting the impact of disease on their ability to work. Prevention and early treatment can lessen disease severity and length, allowing patients to return to work faster.

Economic stability: A healthy healthcare system is essential for economic stability. Healthy people are more productive, earn more, and boost the economy. Healthcare services create jobs and support many industries, including healthcare infrastructure, medical technology, and pharmaceuticals, which boosts the economy. Accessible medical care services ensure that everyone, regardless of socioeconomic background, can

receive adequate care, promoting social fairness and inclusion. Health disparities are reduced, creating a more inclusive and fair society. A "digital platform" is a software- or internet-based system that facilitates basic healthcare. These systems connect patients, healthcare providers, and other healthcare stakeholders via technology. Thus, they simplify patient access to healthcare services, information, and resources. Digital platforms for primary healthcare often have the following features and functions:

1. Online appointment booking enables people to schedule appointments with healthcare professionals via a web portal or mobile app, eliminating the need for phone calls or in-person visits.
2. Patients can consult with medical specialists remotely via telemedicine and other virtual methods. Video conferencing and chat functions on digital platforms enable this. This is useful for non-urgent medical advice, follow-up appointments, and minor health issues.
3. Some platforms offer safe electronic health record (EHR) systems for digitally storing and managing patient medical history records. This allows doctors to immediately obtain patient medical histories, test findings, and prescriptions.
4. Symptom Checkers and Triage: Some internet businesses offer symptom assessment tools to help individuals identify health issues and decide what to do, such as self-care or medical attention.
5. Health education and information To empower patients and encourage self-care, many digital platforms offer reliable health information, instructional tools, and preventative care guidelines.
6. Medication Management: These platforms can aid with medication management by reminding users of refills, dosages, and potential drug interactions. This enhances drug management and adherence.
7. Integration with Wearables and Remote Monitoring Tools Some digital platforms can interface with wearable devices or remote monitoring tools to capture real-time health data, including heart rate, blood pressure, and glucose. This information can be sent to healthcare providers for remote monitoring and timely interventions.
8. Referral Management By letting doctors give and receive electronic referrals, platforms may simplify the process. This may reduce administrative work and increase care continuity.
9. Health Care Analytics and Insights Data analytics and insights from digital platforms help healthcare providers identify trends, track patient outcomes, and improve care.
10. Collaborative Care and Patient Engagement: These platforms provide secure communications, appointment reminders, and personalized health recommendations for patients and healthcare professionals to collaborate.

Digital platforms can improve primary healthcare results, patient access, convenience, and continuity of service. They could improve healthcare access in underdeveloped areas, cut expenses, and encourage self-management.

In developed countries, the use of digital healthcare as a result of significant advancements in digital healthcare in industrialized nations, healthcare delivery, outcomes for patients, and the overall efficacy of healthcare systems have all undergone significant transformations (Da Fonseca, M. H., Kovaleski, F., Picinin, C. T., Pedroso, B., & Rubbo, P. 2021).

2. Digital Healthcare in Developed Countries

United States of America: The United States of America has been the site of the establishment of a number of distinct digital healthcare projects. Electronic health records, also known as EHRs, are becoming increasingly common, which enables medical personnel to easily access and transmit patient information. EHRs are also abbreviated as EHR. Because of the surge in popularity of Telehealth, patients can now have access to virtual consultations with healthcare specialists. Tele health is particularly widespread in rural and underserved places, which is why this opportunity is now available to patients. Additionally, in order to facilitate self-monitoring and better overall health management, the country promotes the utilization of health-related mobile applications and wearable technology. In addition, patients now have access to their own health data as well as control over that data, thanks to the development of systems such as Blue Button.

United Kingdom: The United Kingdom has demonstrated a considerable commitment to the growth of digital healthcare by spending a significant amount of money on this field. The United Kingdom's National Health Service (NHS) has developed many digital platforms, such as NHS Digital and NHS App, which provide users with access to medical records, the ability to schedule appointments, and symptom checks. Access to medical services can also be gained through the use of these digital platforms. Patients are now able to speak with their physicians and other medical professionals via the internet, thanks to the National Health Service's (NHS) introduction of telemedicine services (Muldoon, L. K., Hogg, W. E., & Levitt, M., 2006). Digital technologies, such as chat bots driven by artificial intelligence (AI) and remote monitoring devices, are increasingly being implemented in healthcare settings in the hopes of enhancing patient care while simultaneously reducing total healthcare costs.

Canada: In order to improve the quality of treatment that patients receive and broaden their access to medical services, Canada has been working to introduce digital healthcare projects. As a result of the widespread implementation of EHR systems across the country, medical personnel now have access to patient information independent of the location of the patient's place of treatment. Patients now have access to healthcare no matter where they are located because of the proliferation of Tele health services, which are gaining a lot of traction in more rural parts of the country. In addition, the treatment of chronic diseases in Canada places a strong emphasis on the utilization of various digital health technologies. (Muldoon, L. K., Hogg, W. E., & Levitt, M., 2006) These solutions include mobile applications for self-monitoring as well as programs that provide virtual coaching.

Germany's healthcare system has made significant strides toward becoming more digitally integrated thanks to Germany's efforts. Electronic versions of health cards have been made available in every region of the country. These cards save patients' personally identifiable information and make it possible to retrieve patients' medical records in a secure manner. Telemedicine services, including remote consultations and Tele monitoring, are becoming increasingly popular and are being utilized on a more regular basis. In addition, Germany is making investments in digital health technologies that will assist with changes in lifestyle, the management of medicine, and preventative care. Interoperability of health data and the use of digital technology are both encouraged in this country in an effort to improve patient engagement. This is being done in the context of improving overall healthcare (Muldoon, L. K., Hogg, W. E., & Levitt, M., 2006).

Australia: Australia has implemented a number of various digital healthcare projects in an attempt to extend access to healthcare and increase the overall efficiency of the country's healthcare system. My Health Record is a system that gives individuals the capacity to access and control their own health information online, which helps to enhance care coordination. This gives individuals more power over their own health care. Patients who live in remote areas are now able to contact medical specialists via the internet because the number of Tele health services that are available has expanded. Additionally, Australia places a particular emphasis on the utilization of digital health technologies for the treatment of chronic diseases, the issuance of electronic prescriptions, and the monitoring of patients remotely (Muldoon, L. K., Hogg, W. E., & Levitt, M., 2006).

These examples shed light on the great variety of digital healthcare efforts that have been implemented in industrialized nations. Some examples of these efforts include the utilization of electronic health records, telemedicine services, patient portals, and digital tools for the monitoring and management of health. The inclusion of technology into healthcare systems has the objectives of improving the overall quality of the patient experience, elevating the quality of treatment that patients get, and increasing the efficiency with which care is administered.

3. Digital Healthcare in Developing Countries

Digital healthcare has grown in popularity in developing nations as a way to improve healthcare access and delivery. Five poor countries digital healthcare projects are:

Rwanda: The Rwanda Health Information Exchange (RHIE) has advanced digital healthcare in Rwanda. The Regional Health Information Exchange (RHIE) integrates electronic health records, laboratory results, and pharmaceutical data. It allows healthcare providers to share patient data, improving care coordination and decision-making. Rwanda now offers remote consultations and specialized medical treatment via telemedicine in impoverished areas.

Brazil: Brazil invests in digital healthcare to reach remote communities and improve access. The government launched the Telehealth Program, which offers remote consultations, telemedicine, and educational resources to underserved areas. This project connects patients, especially those in isolated Amazon rainforests, to medical specialists via video chats and smartphone apps. Brazil also uses electronic health data and medications to improve healthcare and continuity.

Kenya: Kenya uses digital healthcare solutions to decrease barriers to healthcare. Kenya has implemented mHealth Kenya, which uses mobile technology to treat patients. Projects like M-TIBA allow users to handle their healthcare finances on their phones. M-PESA is another mobile medical payment program. Kenya uses telemedicine to provide remote consultations, especially in rural areas, and to connect community health workers with healthcare experts for guidance and help.

Bangladesh: Bangladesh has made tremendous progress in implementing digital healthcare projects to improve healthcare delivery and access. Bangladesh has implemented telemedicine, which uses video consultations to connect patients in remote areas with medical professionals. This reduces the need for patients to travel to get medical advice. Health records have also been digitized, and electronic prescription systems have been implemented to improve health care (Madanian, S., et al, 2019).

India: The National Digital Health Mission (NDHM) was launched by the government to create a digital health ecosystem, including the generation of a unique health ID for each person, the digitization of health data, the facilitation of tele-consultations, and the provision of e-pharmacy services (Jain D., 2023).

These examples demonstrate how developing nations are using digital healthcare technologies to overcome healthcare sector challenges, increase access to healthcare, and improve healthcare quality. While each nation's program may vary, the goal is to use technology to close healthcare delivery gaps, making medical treatment more accessible, affordable, and effective for those communities.

Digital platforms in India (Western UP): India's government has promoted and implemented many digital healthcare apps to improve healthcare delivery, access, and administration (Jain D., 2023). Here are some of its most notable uses:

The National Health Portal (NHP) provides accurate and comprehensive information on illnesses, health issues, healthcare programs, healthcare institution directories, and health data to the public. The Ministry of Health and Family Welfare created eVin, the "Electronic Vaccine Intelligence Network," a cutting-edge technological application that digitizes the vaccine supply chain management system, providing real-time information on vaccine stockpiles, storage temperature, and vaccine use. It improves vaccination coverage, reduces vaccine waste, and improves vaccine delivery (Madanian, S., et al, 2019).

Ayushman Bharat, Pradhan Mantri Jan Arogya Yojana (AB-PMJAY): The main health insurance program that offers cashless treatment to eligible participants uses a digital platform to enroll, verify, and track beneficiaries. It also makes electronic payment transfers easier and ensures consumption transparency (Madanian, S., et al, 2019).

eSanjeevani: The Indian Ministry of Health and Family Welfare developed eSanjeevani, a telemedicine platform that lets patients talk to their doctors via audio and video chat. During the COVID-19 pandemic, expanding healthcare services and providing access to outlying areas were crucial.

National Digital Health Mission (NDHM): The NDHM is an ambitious program that aims to digitize health information and create a uniform health ID for every Indian. Its goal is to create a digital ecosystem that makes health information exchange easy and safe, allowing people to access their health data, use tele consultations, and promote interoperability.

The Swasth Bharat Prerak: Program trains young professionals to promote digital tools and technology for grassroots healthcare delivery in collaboration with local healthcare providers to bring digital health projects to fruition.

eRaktKosh: The National Health Authority created eRaktKosh to allow online administration of blood banks and blood inventory. It makes it easier for blood banks to trade blood and blood products, which increases efficiency and reduces shortages.

These Indian government uses of digital healthcare demonstrate their commitment to using technology to improve healthcare services, efficiency, and access for all residents. They want to revolutionize healthcare delivery, improve healthcare systems, and improve health outcomes.

In Uttar Pradesh (UP), several digital healthcare platforms have been implemented to improve healthcare delivery, access, and administration (Mozumdar, A., Aruldas, K., Jain, A., & Reichenbach, L., 2018). The Government of India introduced Aarogya Setu, a smartphone app that provides telemedicine services, COVID-19 information, self-evaluation tools, and containment zone updates. It helps users determine their risk, find testing locations, and more.

The National Health Mission (NHM) site provides complete information on the healthcare programs and initiatives undertaken by the Government of Uttar Pradesh as part of the NHM. The site also provides access to relevant records and reports on various health services, projects, and initiatives.

Using a unique **ID (ABHA ID)**, **e-Kavach**, a mobile and web-based digital health tool, helps frontline workers and facility-based users track patient information longitudinally. The foundation module, enumeration, records family and individual details of all household members and is updated every six months by an ASHA worker.

The Janani Suraksha Yojana (JSY) portal provides information about the scheme, registration, and progress reports for pregnant women and babies in Uttar Pradesh. Its goal is to improve maternal and child healthcare services in the state.

Mantra: The online resource Mantra care offers mental health apps for anxiety, depression, bipolar disorder, PTSD, and eating disorders. Each app includes condition education, a symptom journal to track progress, and relaxation techniques. People who want to understand and manage their disorder should take it. They also offer online counseling.

UP Telemedicine: The Uttar Pradesh government's telemedicine initiative allows patients to consult doctors remotely via video or audio calls for medical advice, prescriptions, and follow-up care.

Swayam Health: Uttar Pradesh's digital healthcare platform offers tele-consultation with doctors, diagnostic test bookings, medicine delivery, and health records management to make healthcare convenient and accessible.

Non-communicable disease: Society, national governments, and the world are concerned about the rising mortality rate of non-communicable diseases (NCDs). NCD risk factors include self-management, genetics, the environment, medical issues, and socio demographics. The focus is on self-management and agreeing on how food affects risk management and NCD prevention at all ages.

IDSP: The World Bank-funded Integrated Disease Monitoring Project (IDSP) was launched in November 2004 to improve monitoring and response infrastructure in India. It focuses on a small list of syndrome-based conditions easily recognizable at community and sub center levels, simplified laboratory tests and rapid test kits, and aggregate data reporting rather than individual case reporting.

eUpchar: The Uttar Pradesh government created e-Upchar to increase patient access to healthcare and convenience. Patients can schedule appointments, get e-prescriptions, view medical data, and use tele-consultation with registered physicians.

IDCF: The Ministry of Health and Family Welfare created the **Intensified Diarrhoea Control Fortnight (IDCF)** to reduce child diarrhoea deaths. The Ministry has made it a national priority to improve child health globally. The Ministry will organize health workers, state governments, and other partners to invest in diarrhoea control, a common paediatric ailment. It promotes the most effective and affordable diarrhoea treatment, oral rehydration salt, and The NRHM flagship program of the Government of India (GOI) celebrates VHND to improve service convergence and community participation to build community ownership. Improving frontline health workers' performance is essential to expanding health care coverage and providing high-quality services.

Platforms for Online Medicine Delivery: 1mg, Medlife, and PharmEasy deliver medicines to cities and towns across Uttar Pradesh, making it easier to get medications. These digital healthcare platforms in Uttar Pradesh use technology to fill gaps in healthcare delivery, especially in rural areas, and improve the state's healthcare system.

4. Competencies in Digital Healthcare System

To this day, the research that has been conducted on digital health abilities has resulted in the establishment of a variety of terminologies. The most widely used name for this competency is "eHealth

literacy," which can be described as the capacity to apply knowledge obtained from an electronic source to the resolution of a health-related issue. To this day, residents and patients have benefited from the development of conceptual frameworks that describe the concept of eHealth literacy as well as its constituent parts. The Lily framework developed by Norman and Skinner, for instance, encompasses a total of six different types of literacy: health, traditional, information, scientific, computer, and media literacy. These competencies have been enhanced even further with the use of up-to-date frameworks such as the "Patient Readiness to Engage in Health Internet Technology" (PRE-HIT) and the "eHealth Literacy Framework" (eHLF). Among them are a variety of factors that either help or hinder eHealth literacy, including motivation, engagement, willingness, anxiety, expectations, and beliefs. However, when referring to health care professionals, the concepts and components that are included in these frameworks should be conceived of in a different way. This is because it is expected of health care professionals that they have the competences necessary to tackle the difficulties that their patients face, rather than a personal health condition. An emergent topic of inquiry has been set around the digital health competencies of health care professionals as a result of this gap, as well as in light of the required competencies to overcome barriers in the processes of digitalizing health care, which is a result of the required abilities to overcome barriers.

Also in this context, other frameworks have been developed, with the majority of them focusing on a particular profession, most notably nurses, and employing the methods of expert consultation, surveys, and consensus (for example, the Delphi research). Both the Technology Informatics Guiding Education Reform (TIGER) version 2.0 framework and the Health Information Technology Competencies (HITCOMP) framework, which are both among the most recent of the frameworks, have found 33 different areas of competence that are articulated in different domains. To be more specific, the HITCOMP framework has provided five different domains, which are as follows: (1) administration, (2) research/biomedicine, (3) direct patient care, (4) informatics, and (5) engineering/information systems/information and communications technology (ICT). Communication, documentation, quality and safety management, teaching, training, and education in health information technology are some of the relevant competencies that have been described by the TIGER framework for individuals who offer direct patient care. Other relevant competencies include teaching and education.

In this light, a recent review took a stab at synthesizing 30 different frameworks in order to provide a condensed version of the digital health abilities that are anticipated from medical professionals. According to the findings, there are still inconsistencies and overlap among the current frameworks regarding the various ways in which the abilities are categorized, the methodologies used to design such frameworks, and the competencies that are included. These inconsistencies are dependent on the various health care professions that are addressed, which include health care professionals who are not directly involved in patient care, such as engineers. In addition, fifty percent of the thirty frameworks were derived from gray literature, and thirty percent of them were produced with the participation of students, resulting in a variety of expected tasks and competencies.

In addition, the development of digital health competencies in accordance with the appearance of new technologies necessitates a continuous update of both the competencies to be deemed relevant and the means to assess adequately how well these competencies have been acquired. To the best of our knowledge, however, no current systematic reviews have been conducted on the competence of health care providers regarding digital health. It is possible that policymakers, managers, and educators might be informed by the provision of a systematic synthesis of the research regarding how to accurately measure the level of competence in the health care sector and how to establish adequate training programs in order to bridge the gap in digital health competencies. In addition, a summary of the data that is already available might provide researchers with information regarding the research gaps that exist in this particular sector. As a result, the purpose of this systematic review is to provide a summary of the digital health abilities that have been investigated in the literature and the instruments that have been used to measure them to date among professionals working in the health care industry.

5. Overcoming Competencies for Better Healthcare

It is necessary for health care employees to have training and education in order to be digitally proficient for a number of reasons. The existing clinical workforce does not have the necessary education or

resources to fully capitalize on the opportunities presented by digital health. In addition, there is a dearth of education regarding the ethical, privacy, and safety concerns that are connected to health information systems. (Rajaram A. et al., 2020). It is necessary to define digital competencies and incorporate them into professional training curricula. Additionally, continuous digital health training needs to be provided at the workplace in conjunction with the acquisition of clinical competencies. Finally, medical professionals need to be given support to develop and test new digital health applications. To begin, the expanding use of digital technology in health care is resulting in a transformation of the tasks and responsibilities of the health workforce in a way that has never been seen before. This strengthens the requirement for capacity building and continuing professional development. For instance, Konstantinidis ST, et al. (2017) found that the majority of National Health Service (NHS) occupations will have a digital component within the next 20 years after the Secretary of State for Health and Social Care in the United Kingdom commissioned "The Topol Review." This was revealed in the review that was recently conducted. Second, the COVID-19 epidemic that has been going around recently has brought to light the significance of remote care as well as its potential. In order to properly detect and treat individuals who may be infected with COVID-19 or any other infection, indispensable diagnostic and treatment tools include computer systems and gadgets that provide virtual consultations. Thirdly, research conducted by Konstantinidis ST et al. (2017) shows that health care personnel would benefit from additional training in digital technology. This is the case even if the current generation of practitioners and the generation that will follow them may be considered "digital natives." Lastly, increasing one's capabilities in the area of digital literacy may result in a higher rate of adoption and implementation of digital services and technologies in medical facilities. In a similar vein, it was shown that a lack of digital health literacy was the most prevalent barrier to the digital transformation of health care. As a result, the adoption of health technology has been gradual in nations such as the United States of America, Europe, and Australia. A growing number of medical schools are including instruction on digital health in their academic programs, and the motivations for doing so are similar to those indicated above.

Because nurses act as a constant point of contact between patients and doctors, they play an important role in supporting health care environments. As a result, they are required to have various aspects of digital capabilities (such as the ability to use staff scheduling systems, extract data from clinical systems, and navigate decision support systems).

6. Integrating Digital Healthcare into Training Module

There will be a number of obstacles to overcome in order to successfully include digital health training and assessment in existing curricula. To begin, there is not enough space in the curriculum to accommodate digital health, which will be a contentious issue. Second, it is necessary to design clinical competences and educational curricula with the understanding that the availability and accessibility of digital infrastructures and bandwidth may vary greatly between different clinical contexts. Third, there must be a sufficient number of highly experienced supervisors and mentors across all of the different locations in order to successfully deliver the requisite education and training. Fourth, competency-based training calls for an integrated program of learning and assessment. This calls for program directors to set learning objectives, select assessment techniques, and incorporate digital health into already established syllabi rather than relying on separate stand-alone courses. Fifth, due to the dynamic and ever-changing nature of digital health, it is probable that a 3- to 5-year update cycle will be necessary to assure the continuous currency and relevance of practice for both the competences and the curricula.

7. Conclusion

The majority of the research published specifically associating DHCs with PC was done more than a decade ago. In order for PC professionals to more reliably realize the benefits of digital technology, there is a need for a DHC set that has been updated to reflect contemporary practices and is up-to-date. Based on this analysis, essential DHC domains and statements have been identified. These can be used as a reference for the development of a set of DHC for PC. Additionally, this review has indicated critical knowledge gaps that need to be considered. A DHC set like this one can be utilized for the development of educational curricula as well as for ensuring that the key DHC for PC are met on a clinical or organizational level, which will, in the end, lead to

better health outcomes. The competencies that should be prioritized in training programs for digital health should vary depending on the type of health care professional, the job they play, their degree of seniority, and the setting. The findings of this review can be used to inform and guide actions pertaining to digital health training. The most common competency domains found represent critical inter-professional competencies that should be incorporated into the training of health care personnel. Frameworks for digital health should be continually updated with new digital health technologies, should be relevant to low- and middle-income nations, and should incorporate underrepresented worker groups in the health care industry, such as allied health professionals. When referring to primary healthcare, the phrase "digital platform" refers to a system that is based on either software or the internet and is designed to simplify the process of providing patients with primary healthcare. These platforms make use of various forms of technology in order to link patients, medical professionals, and various other parties involved in the healthcare ecosystem. As a consequence of this, they make it feasible for patients to access healthcare services, information, and resources in a more straightforward manner.

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