

Perspectives Study on eHealth and quality in health care: implementation time

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DOI: <https://doi.org/10.5281/zenodo.7810351>

Published Date: 08-April-2023

Abstract: The use of information and communication technology in health and health care can improve the quality of care in many ways. The current evidence base demonstrates the (cost) effectiveness of online education, self-management support, and remote monitoring in several areas of healthcare. As new findings gradually provide more evidence of eHealth's impact on quality issues, now is the time to address implementation issues. Documented downsides such as low acceptance, low absorption of or low absorption demand our attention today to take full advantage of eHealth's potential. Innovative science is beginning to provide the tools to address these persistent cultural and behavioral problems. For example, the ceHRes roadmap is a diverse and pragmatic approach that covers user needs. It is now imperative to improve our deployment strategies to advance e-health technologies. This will accelerate the much-needed transformation of our health systems and maintain accessibility, affordability, and quality for all for the foreseeable future.

Keywords: telemedicine, quality of health care, quality improvement, healthcare reform, medical informatics applications.

1. INTRODUCTION

E-health is the use of information and communication technologies to promote health and wellness. It refers to the forms of prevention and education, diagnosis, therapy and care delivered by digital technology, regardless of time and place. As an overarching concept, it brings together related concepts such as telemedicine, mHealth, telemedicine, public health, mental health, or telemedicine. These new forms of delivery create new care content, such as "integrated" care where conventional mental health care is combined with online interventions. Furthermore, they create new behaviors, influences, and thoughts because we interact strongly with technology. Of course, eHealth also refers to secondary care processes supported by IT, such as quality systems and e-government; finance, purchasing, logistics, medical records, case management, appointments, and more. E-health is believed to enhance self-care, self-management, and patient engagement. It is meant to increase the reach and impact of disease prevention and health education. It is driving much-needed global healthcare innovation and curbing increased spending. In short, eHealth merges the public benefits of affordability, quality, and access to healthcare [1]. What are the reasons for such optimism? Does e-health really improve the quality and safety of care? What are the options so far?

2. QUALITY IN HEALTHCARE

In an authoritative publication of the US Institute of Medicine, the authors listed six components of quality in health care for the 21st century: safety, effectiveness, patient-centeredness, timeliness, efficacy and equity [2]. This practice began in

the 1990s and up to the present day quality concerns structures and processes measured at the providers' side through surveys, inspections, clinical registrations or outflow-reports. However, since patients are more and more considered as an important primary source, new quality information from the demand side becomes available from patient experience surveys (e.g. Consumer Assessment of Healthcare Providers and Systems (CAHPS) or the Consumer Quality Index (CQI)), Patient-Reported Outcome Measures (PROMs: self-reports from patients' perspectives about outcomes of care) or comparative social websites on health care. This is an important improvement since at the end of the day, a neatly framed ISO-certificate on the office wall is no guarantee for the actual delivery of good care to those central to the care process: the patients. Patient experience assessments increasingly contribute to transparency in healthcare quality. Outcome indicators measuring patient experience seem to outweigh the so-called process indicators in discussions regarding their significance. The latter do not always correspond to clinical outcomes and at the end of the day they do not adequately imply quality of care. [3] found that publicly reported hospital compliance with the surgical processes of care did not correspond to outcomes for high-risk surgery. [4] found that past experience with doctor-patient communication greatly determines satisfaction with care, much more than for in- stance, patient-reported outcomes on somatic functioning. Beyond structures, processes and outcomes quality is increasingly conceived in a broader sense. With their framework on redefining health care Porter and Teisberg [5] greatly contributed to advancing 'value' (\approx patient health outcomes/costs) as the clear, central and overarching goal of any healthcare system. While measuring patient value is still in its infancy, it appears to become one of the most powerful tools for improving healthcare delivery at large. In the Netherlands, health insurers, patient organizations and care providers collaborate to define the quality of care.

3. E-HEALTH

The digital revolution affects society across all domains: education, industry, art, politics, journalism, leisure, culture and, not in the least, health, healthcare and bio-medical research. Health authorities generally welcomed these developments, despite worries about the quality of online health information and other digital hazards such as privacy or data security. The Dutch Ministry of Health frequently briefs the Parliament with policy papers that emphasize the significance of eHealth for the sustainability of the healthcare system calling for up-scaling and expansion [11–13]. At the international level, organizations such as the European Union, the World Health Organization and the United Nations entertain high hopes and great expectations of eHealth when it comes to the major issues in global health care: ageing, curbing healthcare expenditures, consumerism, prevention and control of infectious diseases [14]. There exists a gap between postulated benefits and actual outcomes, while the potential of eHealth is celebrated, robust results in a variety of care contexts lag behind expectation [16, 17]. shortcomings in standardization, uncertainty around pecuniary issues and ignorance of eHealth among both patients and professionals. Healthcare lags behind if compared with other sectors such as the banking or travel industry.

4. EHEALTH AND QUALITY OF CARE

In a large review study commissioned by the British National Health Service, Sheikh et al. [22] conclude that eHealth could potentially improve safety and quality of care delivery. They continue: 'The major finding from reviewing the empirical evidence—which is of variable quality—however, is that there is still as yet only limited evidence demonstrating that these technologies actually improve patient outcomes' (p. This is caused by the poor quality of the studies themselves and by practical mistakes such as failing to involve end-users, assuming that eHealth works always for everyone or not paying attention to human aspects of implementation.) are likely to result in significant medium- to long-term benefits to organization efficiency, professional practice and in time patient care' (p. They harvested 31 review studies of which 12 (42%) show promising results for (cost-effectiveness, while 11 (35%) show limited or inconsistent outcomes).

Indisputable positive effects on health- and cost-related indices show 7 (23%) re- view studies (Table 1).

Table 1: Effectiveness and cost-effectiveness of eHealthinterventions, based on [24]

Outcomes	Number of review studies	%
Positive	7	23
Promising	12	42
Limited/inconsistent	11	35
<i>n</i>	31	100

Though limited when it comes to the impact on all six components of quality health care by the Institute of Medicine [2] these results show where eHealth stands as of now: effective in education, monitoring and self-management support. eHealth significantly supports enhancement of patients' knowledge about their diseases, their self-management capacities and their quality of life (patient-centeredness). The 'promising' component (42%) includes 12 reviews containing 223 individual studies verging to the 'positive' side. These studies treat a range of eHealth interventions (e. home monitoring, web-based self-management, education, tele-consultation etc.) and a variety of illnesses such as brain injury, cardiovascular diseases, COPD, chronic pain, stroke etc. Comparable outcomes have also been reported in studies with large numbers of patients, such as the British Whole System Demonstrator study [25] with over 3000 participants (diabetes, congestive heart failure, COPD). Additionally, a well-functioning system of care delivery is hardly imaginable without the continuous support of a secondary process driven by information and communication technology such as logistics, appointments, finance, case-management, procurement, (personal) health records etc. Domesticated eHealth technologies facilitate the transformation to a sustain- able system of integrated care where prevention, education and self-management are substantial, prominent, available and accessible options for all [29]. These are indispensable for self-management and cost-effective service delivery. But now the course is clear as to what eHealth actually contributes to the global issue of keeping our health systems affordable, accessible, acceptable and of good quality.

Solving implementation issues is a necessary condition to scale up eHealth technologies that work.

5. IMPLEMENTATION

These are useful to understand what it means to embed new technology in the reality of the multifaceted environment of health care [31]. Validated tools have been developed and made available that increase the odds for successful implementation and evaluation [33] while at the same time manage new risks for patient safety [35]. When all is said and done, eHealth is just health care. But the landing field is the complex healthcare context that increasingly includes informal care and the home environment. The landing itself is a dynamic process of change where people, organization and technology continuously interconnect. Due to its shortening half-life our knowledge in health, care and technology needs permanent refreshment. It is based on extensive research on the uptake and impact of eHealth interventions and on models for development, evaluation and implementation. Or the finding that development and implementation are deeply intertwined and involve continuous evaluation cycles. Or the outcome that eHealth technologies often create new procedures and infrastructures for healthcare delivery and thus implies organizational change. Such principles have been integrated in a wiki where they are further advanced to support the iterative process of development, design, implementation and evaluation. The Roadmap, in fact, is a prelude of improvement science so eloquently advanced by Marshall et al. Theory, methodology, technology and data connected with the moral, physical, social and organizational (micro-) context of patient care. Since while exponential advances in technology disrupt our ideas and practices of conventional care, human behavior tends to change at a much slower pace.

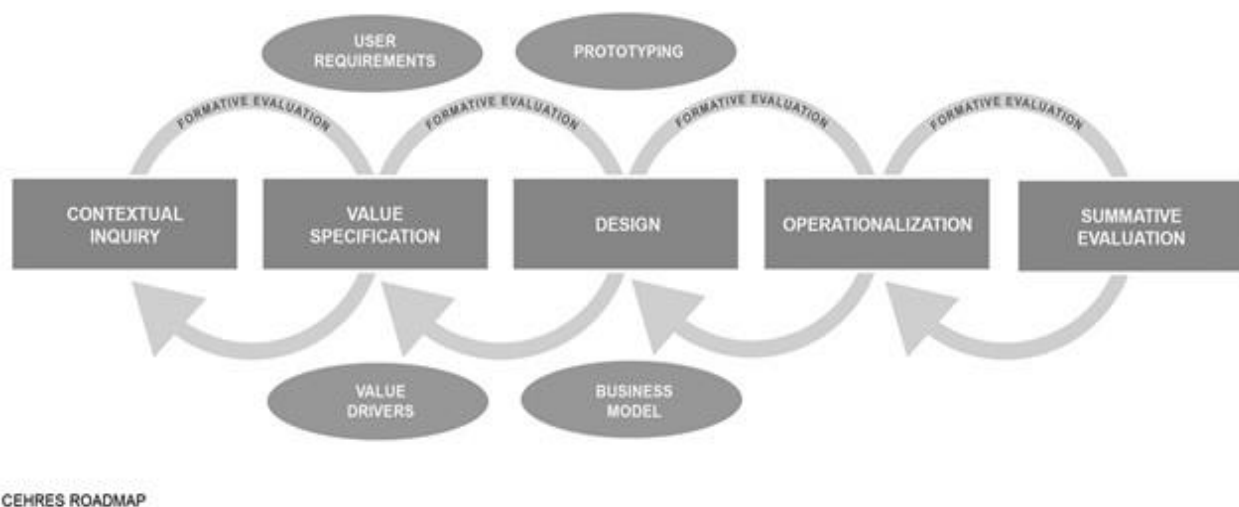


Figure 1: ceHRes roadmap for eHealth implementation [40].

The result could be an enhanced implementation process, e.g. via the use, monitoring and analysis of massive self-measurement data that show what people actually do when they interact with digital media in health care. eHealth implementation is in fact the ultimate casus for improvement science. It is the essential cue for healthcare quality improvement, supported by information and communication technology. Improvement science and healthcare innovation are two sides of the same coin. At the end of the day implementation is not so much about technology as it is about changing behaviours and contexts of care. For now, we must work out these strategies in practice and proceed delicately to learn more about implementing eHealth. And share the outcomes—even if these are negative or indecisive—in order to contribute to improving quality and safety in health care.

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