Needed: Evidence Based EHealth!

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Received: July 13, 2018; Published: July 18, 2018

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Opinion

Healthcare is about to face one of its greatest challenges in history. Due to global aging, in some European countries the percentage of elderly represented in the population may reach to 35% by mid-century; our healthcare system is under pressure [1]. In the near future, more medical professionals will be needed, but will be harder to recruit. How can we keep up with this rising demand preserving high quality and affordability of future health care? To answers these questions governments are continuously looking for innovative and sustainable solutions in order to restrain costs, deliver personalized care and keep care accessible. ‘EHealth’ seems to be promising in the quest for these much-needed solutions. The World Health Organization (WHO) defines eHealth as: “A broad group of activities that use electronic means to deliver health-related information, resources and services: it is the use of information and communication technologies (ICT) for health” [2].

The term eHealth originates from the period when people started to use e-mail. Before this period, around the late 1990s, the term ‘telemedicine’ was exclusively used to describe provision of medical services across distance to improve health, with NASA in 1978 as ‘founders’ due to monitoring their astronauts in space [3]. Nowadays the term eHealth is often used interchangeable with the term telemedicine, which is confusing because they are not synonymous. Faheti et al. [4] searched the Scopus database for an explanation of the difference in use of terminology [4]. This group concluded that the ambiguity is explained by the lack of clarity in the concepts they refer to. They also found that there seems to be some geographically differences in the use of both terms, whereas the term telemedicine is more frequently used in the United States of America and eHealth more in European countries, when looking at the number of published documents.

EHealth may be promising in enhancing sustainability of future care. Indeed, the uptake is growing as institutions and governments are pushing the agenda for it. Nevertheless, it is unclear if true sustainable solutions will be found, as scientific evidence of effectiveness of eHealth solutions is lagging behind [5,6]. In order for eHealth to be successfully and more important, safely integrated into regular practice, ‘Evidence Based EHealth’ is key.

Evidence Based EHealth

In a recently released literature review on skin cancer apps during the British Association of Dermatologists’ Annual Meeting in July 2018, there are serious concerns about the quality of these apps. Researchers warned for major design flaws and safety issues with some of the apps [7]. They found a lack of rigorous published trials on efficacy and safety, and input during the app development from specialists to identify which lesions are suspicious, was limited. They authors acknowledge that future technology will play an important part in skin cancer diagnosis but advise the public to be cautious as it comes with risk. Semigran et al. [8] looked at online symptom checkers in general [8]. They analyzed 23 symptom checkers by applying standardized patient vignettes, on the capability of getting the diagnosis right. From the 23-symptom checkers only 34% percent provided the correct diagnosis. This again is a strong message to be very cautious using this particularly type of EHealth.

In June 2016 James Madara, CEO of the American Medical Association, tried to create awareness around the ‘lacking evidence’ problem as well. Madara firmly stated: “From ineffective electronic health records, to an explosion of direct-to-consumer digital health products, to apps of mixed quality – it’s the digital snake oil of the early 21st century” [9]. This is not a popular message, especially since we are living in the fourth industrial revolution whereas nearly anything seems to be possible: robotics, cancer decision support tools based upon big data, video-conferencing calls with distant patients, teleradiology, sophisticated electronic health records, home monitoring of elderly at home and an endless list of health applications [10]. The mHealth Economics 2017 report described that there are 158000 health apps in the Google Play store, a 50% increase compared to 2016 [11].

Last year, a total of 78 000 new health application were launched. It may thus be clear that the popularity of mHealth is increasing very rapidly. Unfortunately, the evidence for efficacy is largely lacking. In the recently published systematic review of systematic reviews from Marcolino et al. [12] 23 reviews on the impact or effectiveness of mobile health interventions were investigated [12]. The authors
concluded that studies usually do not include the assessment of risks, consumer satisfaction, and acceptability of the intervention. There were no studies that reported on security and confidentiality. Also, costs were not routinely assessed. Regarding the earlier call for ‘snake oil’ from Madara one has to keep in mind that innovations do not necessarily mean improvement of care. In order for digital innovations to be of impact to future healthcare, it should be clearly stated how the innovation is empowering the user in managing or improving health, and it should be developed according to privacy and other regulations in order to be trusted and accepted.

An important reason for the lack of evidence in eHealth is that scientific testing is time consuming, while technology rapidly develops. In a Cochrane Review of 2015, Flodgren et al. [13] assessed the effectiveness, acceptability and costs of interactive telemedicine as an alternative to, or in addition to, usual care. The median year of publication of studies in this rigorous systematic review was 2008. Now, 10 years later, what do these results mean? The classic Randomized Controlled Trial (RCT), the golden-standard for evidence gathering in healthcare, is very time consuming. It might take up to 7 years before data is collected, analyzed and results are published in peer-reviewed journals. Therefore, following the classical research pathway will put novel technology – often the case in eHealth – at risk as technology is fragile to survive and positive results may be needed to sustain the innovation. Furthermore, gain might be dated, resulting from the mere fact that used technology is outdated over time [14].

One may plea this solves the issue of lacking evidence, but on the contrary, patients are also missing out on potentially well fitted opportunities due to a certain timeframe. Besides the time aspect there are practical issues as well. Blinding of the study participants and researchers is difficult to effectuate while investigating digital interventions. Therefore, alternative study designs for the traditional RCT are needed. The systematic review from Ekeland et al. [15] reviewed methodologies used in telemedicine research. The authors concluded that there is not a particular method for evaluation effectiveness of eHealth, but that combinations of apparently opposing approaches like summative (controlled) and formative (subjective) evaluation, can give valuable insights. In addition to this mixed approach, we believe that there are different phases of evaluation as well. For example, feasibility testing will be conducted in a different phase of evaluation than a controlled cohort study design. Researchers should very well weight which method is the most suitable in order to get an answer to their research question. Upon selecting a suitable method for researching eHealth value, one should make sure that the CONSORT-EHEALTH checklist is used. This checklist is an extension of the CONSORT statement which was developed to improve the reporting and standardize eHealth interventions [16].

**Conclusion**

Innovations are much needed in securing future sustainability of our healthcare system. Although there might seem to be quite some barriers along the way there certainly is progress as well. Evidence Bases EHealth is key in ensuring qualitative and safe care. Classic evaluation methods are not very suitable in evaluating rapidly evolving eHealth interventions and evaluation should contain a summative and formative approach. Especially the formative approach whereas a patient’s view, for example through Patient Reported Outcome Measures, often provides very valuable information for optimal implementation and dissemination of an intervention.

**References**

9. America Medical Association CEO James Madara, USA