Best practices in digital health literacy

Scott Conard, MD

Consultant, American Heart Association

ARTICLE INFO

ABSTRACT

The connection between health literacy and health outcomes includes access and utilization of healthcare services, patient/provider interaction and self-care. Digital approaches can be designed to simplify or expand on a concept, test for understanding, and do not have a time constraint. New technologies, such as artificial intelligence and machine learning, virtual and augmented reality, and blockchain can move the role of technology beyond data collection to a more integrated system. Rather than being a passive participant, digital solutions provide the opportunity for the individual to be an active participant in their health. These solutions can be delivered in a way that builds or enhances the individual's belief that the plan will be successful and more confidence that they can stick with it. Digital solutions allow for the delivery of multi-media education, such as videos, voice, and print, at different reading levels, in multiple languages, using formal and informal teaching methods. By giving the patient a greater voice and empowering them to be active participants in their care, they can develop their decision making and shared decision making skills. The first step in our health literacy instructional model is to address the emotional state of the person. Once the emotional state has been addressed, and an engagement strategy has been deployed the final phase is the delivery of an educational solution. While a clear definition of health literacy and an instructional model are important, further research must be done to continually determine more effective ways to incorporate health technology in the process of improving health outcomes.

© 2019 Published by Elsevier B.V.

The American Heart Association recently published a Scientific Statement on the importance of health literacy in cardiovascular disease [1]. The connection between health literacy and health outcomes includes access and utilization of healthcare services, patient/provider interaction and self-care [2]. Since health literacy is closely related to social determinants of health, such as education, income, language barriers, and other physical, cultural, and environmental factors, building knowledge and skill related to self-care can mitigate the health impact of low health literacy. Strategies for addressing health literacy have been identified in the Universal Precautions Toolkit [3]. The most commonly used strategies including attention to the reading level in printed materials, the elimination of medical jargon by using plain language with clear and concise messages, and teach back, designed to ensure that the patient is understanding what the healthcare provider is saying.

While many principles of health literacy can be applied to digital approaches, the promise of health technology on health outcomes is not yet achieved [4]. Digital approaches can be designed to simplify or expand on a concept, test for understanding, and do not have a time constraint. Digital tools have additional advantages over the traditional doctor-patient encounters, such as the time it takes to get to the healthcare provider's visit and back to work or home, collection of biometric and subjective information related to

medication and symptom management, monitoring nutrition and other behaviors, the ability to deliver multimedia education, and the ability to communicate outside of the healthcare setting. The smart phone has democratized access to health-related information in a similar way to how the printing press increased literacy by providing greater access to books [5]. Also, while assessment of health literacy is challenging in a clinical setting, digital tools can enhance opportunities to assess both knowledge, functional and critical self-care skills.

Health technology provides the ability to rapidly adapt, iterate, and adjust in a real time setting to the user – their health literacy, emotional state, social and personal resources, and education level, that was impossible in a pre-health technology setting. The potential for health technology to be the catalyst for significant advances in healthcare cannot be questioned, however as a science there is still much to be done to create platforms and systems that activate and engage those who would benefit before health issues arise and are too far along to be reversed or effectively managed. The value and importance of this research is significant to both individuals, and to society as a whole, as the population ages and the prevalence of chronic diseases continues to create a significant tax on local, state, and national resources.

With the tremendous cost of healthcare, one arena where significant resources are being deployed is wellness programs in

E-mail address: scott@scottconard.com.

corporations. The use of biometric devices, web, app, and other health technology by vendors promising to reduce healthcare costs through prevention has become a huge industry. However, research on the effectiveness of the interventions is still relatively sparse. Validation of the claims of these companies and sharing of best practices with industry in the setting of free market competition makes transparency challenging but does not reduce the need for high quality research. One approach is to show the effectiveness of health technology on improving health literacy over months and following health metrics and costs over years. While a surrogate marker, health literacy has been clearly shown to predict behavior change in self-care, health system engagement, and health outcomes. Strongly encouraging health technology vendors to prove the efficacy of their solutions could lead to significant resources being committed to research and development of continually more effective health technology practices.

The best practices for digital health literacy are more personalized, relevant, interactive, and action-oriented experience. New technologies, such as artificial intelligence and machine learning, virtual and augmented reality, and blockchain can move the role of technology beyond data collection to a more integrated system. Rather than being a passive participant, digital solutions provide the opportunity for the individual to be an active participant in their health. Digital solutions will provide a more person-centered approach with the individual taking more control over their health, and greater access to their data, while staying connected with their health care team.

In addition to the individual capabilities of current and emerging technology, an effective approach may need to be part of a larger strategy of awareness, prevention, and treatment [6]. These solutions can be delivered in a way that builds or enhances the individual's belief that the plan will be successful and more confidence that they can stick with it. Also, they can communicate with *their* support system in a mobile friendly environment.

The Health Literacy Instructional Model developed by Dunn and Conard [7] combines 5 domains of health literacy with the 3 steps to build health literacy skills as shown in Fig. 1. Digital tools provide dynamic flexibility, allowing opportunities to go beyond the issues of static print media. Just in time determination of challenges such as the reading level, the use of jargon, functional skills, understanding of their understanding of key metrics (numeracy), rapid and flexible communication with key healthcare providers, critical skills in a healthcare journey on how to navigate the healthcare system, and individual and shared decision making, all key aspects of health literacy as described in the call to action [8] are all possible, and more likely to occur with the right digital tools.

Digital solutions allow for the delivery of multi-media education, such as videos, voice, and print, at different reading levels, in multiple languages, using formal and informal teaching methods. While knowledge is power and is a key element of building health literacy skills, there is a need to go beyond comprehension to self-care skills associated with improved health outcomes [2]. Numeracy skills can be enhanced by performing the calculations, such as nutrition or medications and providing feedback in real time to the patient.

Navigation skills can be enhanced by providing more transparency regarding cost and quality and can provide feedback on how and when to access the healthcare system. Communication skills can be improved between the patient and the provider by tracking biometric and patient reported measures outside of the healthcare setting and can provide direct communication with the healthcare team. By giving the patient a greater voice and empowering them to be active participants in their care, they can develop their decision making and shared decision-making skills.

But how are these skills developed and deployed in a digital environment? The setting and environment of the physical or digital space is extremely important. Simply providing information, in a face to face manner, over the telephone, through a printed document, or in a digital environment without the proper context is often not effective and may, at times, cause incomplete understanding or even harm.

The first step in our health literacy instructional model is to address the emotional state of the person. In both traditional and digital setting, it is very difficult to be effective if the patient is depressed, anxious, or under a lot of stress. A whole new generation of digital tools has been developed to provide mental health and brain health applications designed to manage emotions, reduce stress and build resilience.

Once the emotional state of the individual has been addressed, the next step is to use a behavioral approach to strengthen engagement and build commitment. A common behavior change approach is motivational interviewing, which is effective in a face to face, counseling setting, but can be used in a tele-health setting. In addition to phone and video interactions, artificial intelligence and the use of chatbots are technologies that can be used to deliver a behavioral approach in a digital setting. Also, behavioral economics approaches, using the camera and other features of smart phones and tablets have the potential for positive outcomes.

Once the emotional state has been addressed, and an engagement strategy has been deployed the final phase is the delivery of an educational solution. Rather than avoiding big words such as cholesterol, saturated fat, carbohydrates, not to mention the trade and generic names of medications, a bank of words and synonyms can be used to create a taxonomy beginning with simple word recognition to more advanced understanding and application. Rather than using flash cards in a classroom, these flash cards can be built into the digital system as a library. Using the taxonomy as a base, the digital system can create, and curate a highly personalized and relevant support system that can scaffold the individual as they grow in their knowledge and self-care skills. This highly personalized system can be designed to deliver content, not only in the desired media format, but also in the tone and style, based on demographic, behavioral and psychographic segments that are most likely to produce the desired results.

The key element in the Health Literacy Instructional Model is the support system of the patient. Our research and experience have shown this support system can be established in group settings that are conducted in-person, on the phone, or online. These programs have been conducted in both a clinical and worksite setting by nurses, dietitians, exercise physiologists, and health coaches [9].

Fig. 1. Dunn-Conard health literacy instructional model.

Declaration of Competing Interest

The authors report no relationships that could be construed as a conflict of interest.

References

[1] J.W. Magnani, M.S. Mujahid, H.D. Aronow, C.W. Cene, V.V. Dickson, E. Havraneck, L.B. Morganstern, M.K. Paasche-Orlow, A. Pollak, J.Z. Willey, on behalf of the American Heart Association Council on Epidemiology and Prevention, Council on Cardiovascular Disease in the Young, Council on Cardiovascular Stroke Nursing, Council on Peripheral Vascular Disease, Council on Quality of Care, Outcomes Research and Stroke Council, Health literacy and cardiovascular disease: fundamental relevance to primary and secondary prevention: a scientific statement from the American Heart Association, Circulation 137 (2018) 00, https://doi.org/10.1161/CIR.0000000000000579.

[2] M.K. Paasche-Orlow, M.S. Wolf, The causal pathways linking health literacy to health outcomes, Am. J. Health Behav. 31 (2007) s19–s26.

[3] D.A. DeWalt, L.F. Callahan, V.H. Hawk, K.A. Boucksou, A. Hink, R. Rudd, C. Brach, Health Literacy Universal Precautions Toolkit, Agency for Healthcare Research and Quality, Rockville, MD, 2010.

[4] L.E. Burke, J. Ma, K.M.J. Azar, G.G. Bennett, E.D. Peterson, Y. Zheng, W. Riley, J. Stephens, S.H. Shad, B. Suffoletto, T.N. Turan, B. Spring, J. Steinberger, C.C. Quinn, on behalf of the American Heart Association Publications Committee of the Council on Epidemiology and Prevention, Behavior Change Committee of the Council on Cardiometabolic Health, Council on Cardiovascular and Stroke Nursing, Council on Functional Genomics and Translational Biology, Council on Quality of Care and Outcomes Research, Stroke Council, Current science on consumer use of mobile health for cardiovascular disease prevention: a scientific statement from the American Heart Association, Circulation 132 (2015) 1157–1213.

[5] Topal.

[6] Jonas.

[7] Dunn and Conard, call to action.

[8] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, National Action Plan to Improve Health Literacy, Author, Washington, DC, 2010.

[9] M. Courtney, S.E. Conard, P. Dunn, K. Scarborough, The game of health: an innovative lifestyle change program implemented in a family practice, J. Am. Acad. Nurse Pract. 23 (2011) 289–297.