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Can Technology Improve Health Literacy?

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Nearly nine out of 10 Americans have low health literacy skills [1]. This is a significant public health concern, as a low health literacy level can negatively impact an individual's ability to navigate the healthcare system, manage chronic diseases, follow a healthy diet, monitor medication, and read educational materials [2-4]. This raises the question: How can we minimize the potentially negative impact of low health literacy on health outcomes? The 2013 Institute of Medicine (IOM) report on health literacy identified technology as a key facilitator in bridging the gap between literacy and health outcomes [5]. Perhaps technology can provide some answers.

Health literacy is defined by the IOM as: "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" [2]. Low health literacy is a stronger predictor of health than age, income, employment status, education level, or race [6]. Health literacy is comprised of numerous skills, including reading and writing (print literacy), basic mathematical calculations (numeracy), and learning and speaking (oral literacy) [2]. To this basic definition, one can also add Electronic Health (eHealth) literacy skills, which are defined as: "The ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" [7]. Computer and technology literacy is a component of eHealth related to the use of these mediums to search for and use health information or to solve health-related problems [7]. eHealth literacy, computer literacy specifically, are increasingly important constructs given the rapid development of computer- and cell phone-mediated health programs.

In the United States, an estimated 85% of adults and 95% of adolescents 12-17 years old use the Internet [8,9]. Almost three-quarters (71%) of adults have used the Internet to search for health-related information and 21% have used some form of technology to track health information [10,11]. [10,11]. Most adults (91%) and 78% of adolescents in the US aged 12-17 years own a cell phone and 55% and 47%, respectively own a Smartphone [8,9]. As of 2012, 19% of cell phone users indicated they downloaded an app to help manage or track their healthcare [12]. Internet and cell phone usage is increasing around the world, and particularly in developing countries [13]. In 2008, developing countries accounted for 52% of the share of Internet users; in 2013, that number rose to 65% [13]. Cell phone usage has seen even greater growth. In 2005, developing countries accounted for 55% of cell phone subscriptions worldwide; as of 2013 that number was over 77% [13]. The Internet and cell phones are poised to provide worldwide access to healthcare information.

Technology, in various forms, has become part of the fabric of the healthcare continuum. It can be a delivery system connecting remote, inaccessible areas and populations to health services and expertise; it can also be a form of assessment and reporting and can capture information from across a city block or around the world.. Technology can be used to aid diagnosis or provide specific healthcare treatment, or more broadly, to gather monitoring and surveillance data [14]. Technology can also be used to provide targeted information by standardizing automated educational messages across programs and by providing text messages tailored to individual needs and health conditions [14,15].

One emerging area of study is the use of technology to assist with weight loss. Indeed, a recent PubMed search for the terms "technology (+) weight loss interventions" resulted in 112 studies. Of these, more than half (63%) were published in the last five years. Because weight loss and weight maintenance require reading and numeric calculations to estimate portion sizes or to keep a diet record, it is not surprising that evidence suggests a relationship between health literacy and overweight/obesity. For instance, low numeracy skills have been associated with higher Body Mass Index (BMI) levels among adults [16]. An inverse relationship has also been found between health literacy and weight in children and adolescents [17,18]. In a 2010 report commissioned by the American Heart Association to review the use of new and emerging strategies in weight loss, health literacy was identified as a key factor to consider when designing and developing technology-based weight loss interventions [19].

There is a paucity of data examining the impact of technology on health literacy. This will be a critical area to monitor in the future as the use of technology expands. The potential of technology-particularly cell phones and the Internet-lie in their acceptability and accessibility to increasingly broader segments of the population. Can technology improve health literacy? This may be the wrong question to ask at this point in our understanding of the field. Perhaps the question we should explore is: What role does health literacy play in the use of technology-based interventions to improve health? As data emerge to address this and other intervening questions regarding the intersection of health literacy, technology, and health outcomes, we are moving closer to discovering the answers we need.

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