Can eHealth Technology Enhance the Patient-Provider Relationship in Rehabilitation?

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FROM THE EDITORS’ DESK

Technology has a long history of use in rehabilitation, both for therapeutic interventions (eg, to provide various kinds of exercise or modalities such as ultrasound) and for remediating disability (eg, assistive technology and prosthetic limbs). However, the use of electronic technology is increasingly pervasive in the delivery of health care, including rehabilitation. The term eHealth refers to the use of electronic technologies in health care, many of which fall under the broad category of Telehealth. The use of the term eHealth is rapidly evolving, but some eHealth technologies with potential relevance to rehabilitation include videconferencing, store-and-forward imaging, mobile apps, sensor-based and Internet-based systems for data collection/communication, and algorithmic software to help interpret electronic data (eg, data in the electronic health record and sensor-based data).1,2

Although eHealth offers many benefits, the effects on the patient-provider relationship have been problematic. The constant presence of such technology can consume health care providers, sometimes requiring that they spend more time with electronic health records and software to support medical decision making than seeing patients face to face,3 which, in turn, is perceived by patients as less effective.4 Increasingly, patients themselves are turning to the Internet to find information on their disorders and using algorithmic searches to “e-diagnose” themselves.4,5

Like other health care providers, rehabilitation providers face the technologically driven loss of human interaction with their patients.6 Models for rehabilitation patient-provider communication emphasize the importance of therapeutic connection, and studies7-9 show that the therapeutic relationship can affect rehabilitation outcomes. It is critical that as a field we are aware of new and developing eHealth technologies that might help to foster patient-provider connection and patient-centered health care in the context of rehabilitation.

The goal of this Editorial is to raise awareness among rehabilitation providers about a growing body of technology, its diversity, and its potential applications to support and enhance the critical patient-provider relationship in rehabilitation. To critically examine the potential ways eHealth technologies might be used to enhance the rehabilitation patient-provider relationship, we focus on 3 aspects of a model proposed by Jesus and Silva7 for patient-provider communication in rehabilitation: (1) knowing the person and contextual factors; (2) effective information exchange and education; and (3) shared goal setting and action planning.

Knowing the person and contextual factors

Given the importance of contextual factors in disability outcomes,10 it is critical for rehabilitation providers to understand the patient’s contextual factors. Lack of information on contextual factors may render useless otherwise effective interventions, particularly those whose effectiveness depends on environmental context and contextually relevant training (eg, assistive technology). Home visits are a helpful solution11-14; however, home visits are expensive and inefficient and challenging to coordinate, and health providers with the relevant expertise may not be available.15,17

In fact, most rehabilitation providers see their patients out of context in the hospital or a clinic, with its inherent limitations. Providers compensate through intensive discharge planning; nonetheless, that disconnect can affect the patient-provider relationship either during treatment, when the patient does not feel fully understood, or on return home, when disparities between the hospital-/clinic-based therapeutic plans and reality become apparent. Teletechnology offers a potential solution.

Photos and videos can enable patients to provide real-time information on their particular challenges, enabling “ecological momentary assessment.”18 Real-time televideo has been used to remotely deliver in-home therapy services with improved outcomes over usual care.19-20 It has also been used to support in-
home rehabilitation of severely impaired veterans and for rehabilitation after orthopedic surgery. Photovoice is a technique wherein photo/video images are used to depict one’s life and share it with others—the richer subjective fostering improved understanding. To provide a concrete example: in commenting about a photovoice documentary of daily experiences of 3 patients who lived in wheelchairs, a physician wrote, “None of which [the patient’s fears] were apparent during the conversation with his doctor.” The efficacy of photo/video images across these diverse populations and modes of use is striking, lending truth to the aphorism a picture speaks a thousand words.

Effective information exchange and education

In-person health care delivery is constrained by time. Electronic technology has the potential to increase opportunities for communication and education, with technology ranging from simple home messaging devices that query patients periodically (eg, about particular problems or therapeutic goals) to sensor-based systems to sophisticated interactive systems. Data on the direct effects of sensor-based technologies on patient-provider communication are limited, but there are some studies showing beneficial effects on rehabilitation outcomes. For example, a number of studies have examined use of accelerometers to guide treatment, with several studies showing improvements in physical activity and gait, albeit with limited long-range health outcomes. Interactive patient educational systems are another example, having been shown to improve outcomes for diverse medical populations, and they seem promising for use in rehabilitation, given the central role of patient education in many rehabilitation interventions.

Electronic technologies for patient education also include mobile apps, a rapidly growing type of health care technology. Commonly referred to as mHealth, in 2013 there were more than 17,000 health-related mobile apps targeting consumers/patients. More than 60% of mHealth apps have informational and/or educational components. A number of mobile apps have been developed for physical rehabilitation, for example, to support exercise training and measurement (eg, gait, balance, and range of motion). In addition, in their effort to better meet the health and behavioral needs of veterans, the Department of Veterans Affairs and the Department of Defense are in process of developing a wide array of mobile apps, including some that enable ecologically embedded assessment of self-care and behavioral function. Although mobile app development has far outpaced its evidentiary support, mHealth has great potential application in rehabilitation for 2 reasons: (1) enabling practice outside the clinical setting could facilitate motor learning believed to underpin outcomes for many conditions treated by rehabilitation and (2) the broad availability and portability of mobile phones could enable provision of real-time, ecologically embedded information (ie, ecological momentary assessment).

Shared goal setting and action planning

One common problem with patient care is adherence—the best laid plans come to naught without adherence. Adherence and outcomes in rehabilitation can be improved by shared goal setting and action planning, personally tailored educational interventions, and feedback to patients’ about their performance. Electronic technologies, sometimes referred to as persuasive technologies, are available to help with all these. For example, technologies to enhance physical activity may attempt to motivate patients by personalized goal setting, providing various rewards and reminders, journaling by the patient, and linking with the patient’s social network. Indeed, focus groups and user feedback indicate that shared goal setting and tailored feedback in particular may better enable the patient to effect change.

A major advantage of the increasing wealth of electronic technology is that it supports multimodal ways to reach out to the patient. For instance, a successful cardiac rehabilitation intervention provided standardized education about cardiovascular disease through the Internet, provided access to Internet-based discussion forums, and sent the patients tailored content via the website along with mobile text messages, with resultant higher levels of physical activity as shown in a small randomized trial. Mobile apps have particularly broad potential applicability for both goal setting and action planning, with the Veterans Affairs taking a lead in developing tools to foster veterans’ engagement in their own health care. The added information on goals and personal action plans enabled by such technologies may not only foster enhanced understanding of the patient’s perspective but also stimulate discussion, which, in turn, reinforces the patient-provider relationship.

Limitations and next steps

These new technologies may confer novel benefits, but they also confer some novel challenges, limitations, and required next steps.

Challenges and limitations

Any sort of health information brings with it 3 interrelated concerns—privacy, confidentiality, and security—each of which may be uniquely affected by the type of technology, the information the technology enables, and who interfaces with the technology. The eHealth and related mHealth fields are rapidly evolving, both from a technological perspective and from a legal perspective. Clinicians who may wish to use novel eHealth technology and have questions about information security, privacy, or confidentiality should consult their local “privacy officer,” office of information technology, and/or the manufacturer or vendor of the technology; technology should be avoided if information is lacking about the risks and protection of the patient’s data. The interested reader is referred to reviews by Martinez-Pérez et al and Lumpkin.

Clinicians may worry “who has the time to watch these things or tell the patient what to film?” Increasingly, third-party payment is available to compensate clinicians for time spent using eHealth technologies, but compensation can vary according to the type of technology, the types of clinicians using the technology (eg, physician vs allied health provider), the location of services (eg, rural vs urban and clinic vs home), the condition being treated, and with the third-party payer. The Centers for Medicare and Medicaid Services provide compensation for “telehealth” at the same rate as other face-to-face care, but only if that care is provided using real-time televideo and it further limits payment for some services to one of several rural health demonstration projects. The Centers for

List of abbreviations:
CPT  Common Procedural Terminology
Medicare and Medicaid Services has 2 Common Procedural Terminology (CPT) codes broadly relevant to the use of eHealth technologies: The CPT codes 99090 may be used for the “analysis of clinical data stored in computers (eg, electrocardiograms, blood pressures, hemotologic data)” and 99091 for “the collection and interpretation of physiologic data (eg, electrocardiogram, blood pressure, glucose monitoring) digitally stored and/or transmitted by the patient and/or caregiver to the physician or other qualified health care professional.”52 Both CPT codes 99090 and 99091 may be used in any location.

Next steps

Electronic technology has great potential to enhance the rehabilitation patient-provider relationship. However, meeting that potential will require dedicated attention to 3 critical areas: (1) policy, regulations, and payment; (2) research and evidentiary support; (3) clinician and patient training. In general, policy, payment, and regulations pertaining to Telehealth, eHealth, and mHealth are rapidly evolving and can vary considerably by payment source, by state, and within particular health care organizations. The Veterans Health Administration has developed detailed policy, regulations, and training for Telehealth,53 and more recently mHealth.54 The American Telemedicine Association55 and the Center for Connected Health Policy56 are good sources of information on current reimbursement and regulations.

Research and implementation studies are needed within and across conditions to inform clinicians and policymakers about when, where, and what types of eHealth to support. For example, most eHealth technology has targeted toward less disabled populations, so concerns may be raised about its use with persons who have more severe impairments. Pilot studies supports potential applicability of eHealth technologies to persons with more severe impairments,57 but further research is needed to show efficacy, to adapt the technology for use by special populations, and to develop appropriate training both for patients and for providers. Training requirements for patients and providers are complex; however, lessons learned from implementation science might be fruitfully applied to help with “technophobia” and skill acquisition.58,59

We believe that eHealth technology has broad potential applicability in rehabilitation and that it is particularly germane to the patient-provider interface so critical to successful rehabilitation. Although more work still is needed (eg, to provide evidentiary support and policy/regulatory development), the technological building blocks already are there. Rehabilitation providers have significant expertise and comfort with technology and they have broad expertise in effective patient-provider communication, which means the field is well-placed to take a leader role in use of eHealth technologies to enrich the patient-provider relationship.

Keywords

Patient-centered care; Rehabilitation; Technology; Telehealth

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References


