Barriers And Challenges To Implementing Telehealth Among Physicians And Advanced Practice Nurses In The United States

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Barriers and Challenges to Implementing Telehealth among Physicians and Advanced Practice Nurses in the United States

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August 2018
### Barriers to Telehealth Adoption among Healthcare Providers in the United States

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Einolghozati, M. August 2018.
Introduction

Telehealth includes a wide variety of technologies and methods to deliver virtual medical, health, and education services and contains four distinct areas of applications including live video, store-and-forward, remote patient monitoring, and mobile health (The Center for Connected Health Policy, n.d.). The growth and evolution of telehealth has opened new paths for efficient and affordable healthcare services in the United States and around the world (Olson, McSwain, Curfman, & Chuo, 2018). However, various obstacles such as technological, financial, legal, business strategy, and human resource have challenged widespread telemedicine adoption by healthcare organizations for 40 years (LeRouge & Garfield, 2013, para. 1). Prior studies identified barriers related to licensing, credentialing, medical malpractice, and reimbursement as major barriers to the general use of telehealth in the healthcare (Uscher-Pines & Kahn, 2014). But, the relative importance of these barriers from clinicians’ perspectives is little-known, leaving healthcare managers and policymakers with little direction about how and where to best implement this technology.

Significance

A recent Medscape survey among physicians to assess their attitudes toward telemedicine showed that physicians have some concerns regarding telemedicine including liability and reimbursement (Cranford, 2016). Among nurse practitioners, credentialing, reimbursement, patient privacy and the use of appropriate equipment are some of the most critical issues with telemedicine (Balestra, 2018). Healthcare providers play a crucial role in telehealth adoption because their decision to use telehealth is the first step towards the emergence and sustainability of telehealth networks.
The objective of this review is to examine the various barriers and challenges physicians and advanced nurses experience when implementing telemedicine in the United States. This review will also identify new trends in telemedicine that have been reported in similar studies. What are the perceived barriers to the adoption of telemedicine? Are these perceived barriers unique to one or more healthcare provider types?

This review intends to record the most frequently encountered barriers by healthcare providers and the potential attempts to overcome those challenges.

This literature review utilizes the definition of telehealth from the World Health Organization (WHO):

The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities (World Health Organization [WHO], 2010, p. 9)

This definition determines the topic and identifies the principal terms for a literature search.

Some differentiate between telemedicine and telehealth with the former limited to the services delivery by physicians only, and the latter implying services rendered by healthcare professionals in general, including nurses, pharmacists, and others (WHO, 2010). However, for this review, telemedicine and telehealth are synonymous and used interchangeably.

**Background**

Distance healthcare services have been in practice for centuries, with providers using available resources to communicate with patients (Kim, Alanazi, & Daim, 2015). During the
1920s, telemedicine was very valuable, where doctors at the coast station helped ships with medical emergencies in the heart of the ocean by using radios (Kim et al., 2015). Telehealth has many benefits for patients and providers, as well as the economy (Kim et al., 2015). Telehealth offers the following advantages: increased access to general and specialized healthcare services, care delivery to rural and underserved areas, healthcare providers have greater flexibility in scheduling, and patients save time and money in seeking care (Kruse et al., 2018). Also, studies have identified telehealth services as particularly cost-effective (Cary et al., 2016). In general, telehealth can improve the healthcare system and reduce the cost of the treatment (Kim et al., 2015).

The Institute for Healthcare Improvement (IHI) developed the Triple Aim as an approach for the healthcare system to use innovations to concurrently promote three things: the experience of care by patients, the health of all populations, and the cost of care (Institute for Healthcare Improvement, n.d.). Telehealth is a critical tool in helping to achieve the Triple Aim for a variety of reasons. First, telehealth improves the care experience by giving patients more access to care with less disruption to their lives and increasing patient engagement (Kim et al., 2015). Second, telehealth significantly reduces healthcare service costs because of operating efficiencies. Third, telehealth offers better access to care for all populations because it is a powerful means of overcoming specific barriers to care, particularly for populations located in rural and underserved areas where there may be a dearth of practitioners (Kim et al., 2015).

**Methods**

**Search Strategy**

Medical literature from January 2012 to July 2018 were searched using the following bibliographic databases: Academic Search Complete, the Cumulative Index of Nursing and
Allied Health Literature (CINAHL), PubMed (MEDLINE), and ProQuest. The keywords used for the research in this study were: barrier, challenge, difficulty, obstacle, adopt, implement, telemedicine, telecare, telecare, telehealth, telehealth, mobile health, mHealth, m-Health, eHealth, e-Health, telepsychiatric, telepsychiatric, telerehabilitation, telerehabilitation, physician, doctors, medical practitioner, nurse, and clinician. The exact search phrases used in all the databases were ("Telemedicine" OR "telecare" OR "telecare" OR "telehealth" OR "telehealth" OR "mobile health" OR "mHealth" OR "m-Health" OR "eHealth" OR "e-Health" OR "telepsychiatric" OR "telepsychiatric" OR "telerehabilitation" OR "telerehabilitation") AND ("barrier" OR "challenge" OR "difficulties" OR "obstacle" OR "adopt" OR "implement") AND ("physician" OR "doctors" OR "medical practitioner" OR "nurse" OR "clinician"). Boolean operators and quotation marks were used in the search process to capture variants in the dictionary and to identify the desired intersection of telemedicine, barriers, and physicians or nurse practitioner.

**Inclusion and Exclusion Criteria**

Using the key words, the following number of citations were returned: Academic Search Complete: 1139; CINAHL: 748; PubMed: 778; and ProQuest: 2704. Next, the articles were filtered using the publication dates from 2012 to 2018 to evaluate the most recent barriers to implementing telehealth. Additional overall inclusion criteria were: free full-text, English language, scholarly (peer-reviewed) journals, humans, and geography-United States.

After applying the filters to Academic Search Complete, CINAHL Complete, PubMed, and ProQuest Central databases, the search was narrowed down to 24, 13, 145, and 39 articles, respectively. All abstracts were screened to determine whether the article was relevant to this review. To be included, a study had to (1) assess physicians’ or nurse practitioners' perspectives
regarding barriers in remote health adoption (or the terms m-Health, telemonitoring, telehealth, or telemedicine); (2) show results of an implemented study or trial; (3) and occur in the United States. All duplicate texts and articles without available full texts were excluded. Furthermore, articles that were systematic reviews, article reviews, opinion articles, and all other summary-type articles were excluded. Through this process, 12 articles were selected for the literature review. Figure 1 illustrates the literature selection process.

The 12 included studies were qualitative studies and conducted in the United States. All articles were published between 2012 and 2018, as required by the search criteria. Three studies obtained data through interviews (Levine, Richardson, Granieri, & Reid, 2014; Moeckli, Cram, Cunningham, & Reisinger, 2013; Silva, Farrell, Shandra, Viswanathan, & Schwamm, 2012). Three studies used mixed methods including interview and surveys to collect data (Ray et al., 2017; Rutledge, Haney, Bordelon, Renaud, & Fowler, 2014; Ward et al., 2015). Other studies used surveys to collect data. Study length ranged from four weeks (Rogove, McArthur, Demaerschalk, & Vespa, 2012) to two years (Ray et al., 2017). Four studies did not report their length (Driessen, Castle, & Handler, 2018; Silva et al., 2012; Rutledge et al., 2014; Ward et al., 2015). The number of participants in the studies varied from 15 (Driessen et al., 2018) to 1630 (Jetty, Moore, Coffman, Petterson, & Bazemore, 2018).

All but one study (Jetty et al., 2018) had less than 150 participants. All of the studies were conducted in English, and the study participants included physicians and nurse practitioners. A variety of terminology was used to describe the remote care in each study. Two studies employed the American Telemedicine Association definition of telemedicine (Driessen et al., 2018; Rogove et al., 2012). One study used telemedicine definition according to the Centers for Medicare and Medicaid Services (George et al., 2012). The remaining studies used their own
definition of telehealth or telemedicine. The most popular term used in the articles was “telemedicine” was used in 9 of the 12 studies. One study used “telehealth” (Olson et al., 2018), and two studies employed “tele-ICU”, a specialized telemedicine implementation (Moeckli et al., 2013; Ward et al., 2015).

**PRISMA Flow Diagram**

*Figure 1. The literature selection process*
Results

After identifying barriers to successful telehealth implementation among the included studies, the results were classified into nine overarching themes including cultural, educational, financial, human resource, legal, regulatory, technological barriers, workload and time barriers, as well as other barriers. These themes are ordered according to their frequency in the studies. In the following paragraphs, the most significant obstacles to telehealth adoption for each theme are introduced, and further details about their characteristics are defined. For these characteristics, sources are provided as exemplars but are not intended to be exhaustive.

Financial Barriers

Financial barriers were identified in 10 of the reviewed studies. Inadequate reimbursement or lack of compensation was mentioned in eight of the studies as significant barriers to telehealth adoption. Lack of funds for the purchase and start-up of a telehealth program and the high cost of ongoing technical support and equipment maintenance were reported in five of the studies (Driessen et al., 2018; Ray et al., 2017; Rogove et al., 2012; Rutledge et al., 2014; Silva et al., 2012). Two studies noted that inadequate reimbursement or lack of compensation is not a significant barrier in starting telehealth programs, but they are viewed as substantial barriers to long-term sustainability of the programs (Rogove et al., 2012; Uscher-Pines & Kahn, 2014). Limitations regarding reimbursement are applied to both government and nongovernment insurers, and each state defines the regulations for private payers (Rogove et al., 2012). In states without laws that mandate coverage for telehealth, payers can restrict or encourage telehealth growth (Olson et al., 2018).
Cultural Barriers

Cultural barriers were identified in nine of the reviewed studies. The primary cultural challenge, indicated in nine of the publications, was providers’ unwillingness to change or resistance to changing the practice patterns or clinical standards. The studies noted various reasons for healthcare providers’ unwillingness to change. For instance, one study mentioned that healthcare providers believe telemedicine often does not add value beyond a traditional telephone call (Uscher-Pines & Kahn, 2014), two studies indicated that the reason for the resistance to change is providers’ unfamiliarity to telemedicine technology (Moeckli et al., 2013; Ward et al., 2015). Rogove et al. (2012) reported that the local providers would feel a threat from the remote presence of expert consultations. The second cultural challenge noted in three of the studies was the negative impact of telemedicine on physician and patient relationship (Levine et al., 2014; Rogove et al., 2012; Ward et al., 2015). For example, Levine et al. (2014) suggested that telehealth might lead to a loss of contact between the patient and the physician, and patients would be one step further away from their doctor with a telemedicine intervention.

Regulatory Barriers

Regulatory barriers were reported in eight of the publications. Three barriers, credentialing, cross state licensing, and lack of inter-organizational policies were described in at least three studies. The credentialing process for providers who practice using telemedicine was cited in half of the reviewed studies (George et al., 2012; Olson et al., 2018; Ray et al., 2017; Rogove et al., 2012; Silva et al., 2012; Uscher-Pines & Kahn, 2014). For instance, one study indicated that the credentialing is a ‘‘nightmare’’ because many physicians must complete redundant and challenging paperwork for each practice site (Uscher-Pines & Kahn, 2014). Cross-state licensing or licensing out-of-state physicians was identified as a regulatory barrier in four of
the reviewed publications (George et al., 2012; Ray et al., 2017; Rogove et al., 2012; Silva et al., 2012). George et al. (2012) state that most telehealth programs are limited to within state, possibly due to licensure regulations requiring a doctor to be licensed in the state in which the patient is located. The third most frequently cited regulatory barrier was a lack of intra-organizational policies or protocols to support the use of telemedicine which was reported in three studies (Jetty et al., 2018; Ray et al., 2017; Rutledge et al., 2014). Rutledge et al. (2014) note that the coordination of IT systems and protocols with and between facilities and providers was presented as a barrier.

**Technological Barriers**

Technological barriers were referenced in eight of the studies. Among the eight studies, five studies reported barriers pertaining to poor telemedicine technology usability (George et al., 2012; Levine et al., 2014; Ray et al., 2017; Rutledge et al., 2014; Uscher-Pines & Kahn, 2014). Levine et al. (2014) state that several clinicians highlighted the importance of devices with a user-friendly design appropriate for the specific needs of older patients and clinicians. Technological problems, including dropped or slow connections and limited access to broadband, were mentioned in four of the studies (Olson et al., 2018; Rogove et al., 2012; Rutledge et al., 2014; Silva et al., 2012). One study noted that the inability to perform a complete physical examination is an essential barrier to more implementation of telemedicine (George et al., 2012).

**Workload and Time Barriers**

Workload and time barriers were identified in seven of the studies. Among the seven studies, four studies noted that telemedicine integration into the established workflows is a barrier and adds another step when a phone call could suffice (Driessen et al., 2018; Moeckli et
Moeckli et al. (2013) reported ICU providers’ experience work disruptions and extra workload associated with shifts in their responsibilities and roles related to the Tele-ICU. Lack of provider time or time constraints were noted in three studies (Jetty et al., 2018; Olson et al., 2018; Ray et al., 2017). Ray et al. (2017) state that telehealth is not often used because physicians are very busy and time to set up and make a call is a constraint.

**Educational Barriers**

Difficulty in using telemedicine equipment due to lack of appropriate training was identified in six of the publications (Driessen et al., 2018; Jetty et al., 2018; Moeckli et al., 2013; Olson et al., 2018; Ray et al., 2017; Rutledge et al., 2014). Moeckli et al. (2013) state that despite training provided by the tele-ICU program implementation team, most providers stated that they knew very little about the program before its activation. Jetty et al. (2018) note that lack of training in rural and urban family physicians is the most significant hurdle to the adoption of telehealth.

**Legal Barriers**

Concern regarding malpractice liability was identified as an obstacle to the implementation of telehealth programs in five of the reviewed studies (Jetty et al., 2018; Levine et al., 2014; Ray et al., 2017; Rogove et al., 2012; Silva et al., 2012). Rogove et al. (2012) note that liability issues including lack of case law and lack of clear safety and outcome data were identified as barriers to the telehealth program implementation and need to be addressed. Levine et al. (2014) note that “if an adverse event does happen [and a provider does not respond appropriately], does it come back to bite us?” (p. 290). Silva et al. (2012) state that lack of
national standards for malpractice determinations is a challenge to the greater implementation of telemedicine programs.

**Human Resource Barrier**

Lack of participating healthcare providers was referenced in three of the reviewed studies (Jetty et al., 2018; Ray et al., 2017; Rutledge et al., 2014). Unavailability of staff (Ray et al., 217), lack of participating physicians and specialists (Jay et al., 2018) and the shortage of nurses and physicians (Rutledge et al., 2014) are barriers to telehealth adoption and implementation.

In addition to the aforementioned barriers, other barriers were identified by only one or two studies. Uscher-Pines and Kahn (2014) reported misaligned incentives as a barrier. “The true benefit of telemedicine is to society, and maybe the insurers, rather than the institutions in the system” (Uscher-Pines & Kahn, 2014, p. 993). Levine et al. (2014) referenced information overload as an obstacle to telehealth adoption. Many providers state that the large amounts of data that a telemedicine device would likely generate is a serious concern for them (Levine et al., 2014). Two studies identified patient lack of interest or patient resistance as challenges to implementing telemedicine (George et al., 2012; Rutledge et al., 2014). Olson et al. (2018) reported poor business model sustainability and contracting problems as barriers that are preventing the growth or expansion of telehealth.

**Discussion**

Telehealth offers new paths for efficient and affordable healthcare services in the United States and provides the healthcare sector substantial capacities for solving some of its most significant issues such as the increasing number of medical errors and raising costs. Prior studies identified various barriers such as the lack of reimbursement or concerns regarding credentialing or malpractice liability to the general use of telehealth in the healthcare. However, the relative
importance of these barriers from clinicians' perspectives is little-known, leaving healthcare managers and policymakers with little direction about how and where to best implement this technology because providers’ decision to use this technology is the first step in the emergence and sustainability of telehealth networks. Without identifying and overcoming barriers to telehealth adoption among clinicians, prosperous and sustainable implementation of telehealth is almost impossible.

This study recorded the most frequently encountered barriers to the adoption of telemedicine from providers’ perspective in the United States. Financial issues were the most common barriers as they were identified in ten of the reviewed publications. Cultural problems were the second most common obstacle, cited in nine of the studies. Regulatory challenges, as well as technological obstacles, was reported in eight of all the publications. Concerns regarding workload and time were referenced in seven of the studies. Educational limitations were cited in six of the publications. Legal issues were noted in five of the reviewed studies. Finally, human resource problems were reported in three of the publications.

It is not new to inspect the barriers to remote care. Studies and reviews have identified various challenges in this regard. This review found similar results to other studies, but this literature review investigated the barriers from providers’ perspective which have not been presented previously in the peer-reviewed literature reviews. Most studies have found the lack of reimbursement as the most common barrier while this review found providers’ resistance to change as the most common obstacle perhaps because this review explored barriers from the providers’ perspective.

Several limitations in this review were recognized. Although four databases were searched, it is possible that some articles fitting the inclusion criteria were missed. There are
various descriptive terms for remote care, and it cannot be claimed that the search criteria included a comprehensive list of these terms. The total sample size for this review was 12 studies. Identifying barriers was quite challenging as they were not always clearly identified within the studies, so best judgment was used to identify, evaluate, and categorize the barriers in each study. In some instances, it was quite difficult to decide whether some issues were in fact barriers, or a symptom of a barrier (e.g., difficulty in using telemedicine equipment); therefore, the identification and determination of barriers were subjective. Finally, some studies only had limited information available and did not explain their findings in detail.

Many of the reviewed studies had small sample sizes, and they did not explicitly state whether the participants included physicians and nurse practitioners. Future studies could examine barriers to telehealth adoption exclusively among physicians or advanced practice nurses with larger sample sizes. Healthcare providers are critical stakeholder group for the successful implementation and continued use of telehealth in the healthcare system. Without solving their concerns, a successful and sustainable telehealth implementation is almost impossible.

**Conclusion**

This literature review identified several barriers to the adoption of telehealth from clinicians’ perspectives and categorized them into eight main categories: cultural, educational, financial, human resource, legal, regulatory, technological, as well as workload and time. Financial barriers were the most common obstacles to the implementation of telehealth programs. The top three factors under the financial barriers were reimbursement, start-up costs, and ongoing costs. Cultural barriers were the second most common barriers to the widespread
adoption of telehealth. The most significant cultural factors included providers' resistance to change and the negative impact of telehealth on the physician and patient relationship.

Regulatory barriers included the challenges regarding telemedicine credentialing process for providers, licensing out-of-state physicians, and the lack of intra-organizational policies or protocols to support the use of telemedicine. Concerns regarding malpractice liability and lack of national standards for malpractice determinations were the essential legal barriers to implementing telehealth. Telehealth consists of high technology systems that need complex hardware and software that require a specific level of computer skills from providers and physicians. Factors leading to technical barriers included insufficient telehealth technology usability, limited access to broadband, a lack of computer skills, and a lack of appropriate training and technical support.

The workload and time barriers included telehealth integration into the established workflows and a lack of provider time. Human resource barriers including lack of participating physicians and specialists and the shortage of providers were considerable hurdles to telehealth adoption and utilization. This review shows that the adoption of telehealth alters the nature of care needs to be acknowledged. Telehealth is not merely replacing face-to-face care with technology, support must be given to providers to ensure that they can use their knowledge, skills, and judgment within this changed context.
References


