Question 5 Fact Sheet

Question 5: How effective is telemedicine as a means of providing diabetes self-management care compared to traditional face-to-face visits with a healthcare provider for citizens in rural areas?

What research has been conducted in this area? Telemedicine is an effective means of providing diabetes self-management care to a rural patient population. Research shows...

1. Improved knowledge and empowerment
   - Significantly improved participants’ knowledge and confidence in their ability to face challenges resulting from diabetes. (1, 10, 16, 22, 24, 30)
   - Home tele-visits with a dietician or nurse educator every 4-6 weeks, increased patients’ understanding of the relationship between diet and exercise and diabetes. (12)
   - Case management practices for patients with diabetes that include an educational component that addresses life-style and dietary change are effective in helping patients with long-term control of diabetes. (13, 14, 17, 27)
   - Inclusion of a telehealth educational component significantly decreased the number of patients who felt overwhelmed with management of their diabetes. (20, 25)
   - In addition to improving health outcomes, telemedicine has the benefit of fostering patient empowerment. (23, 25)

2. Improved access to care, adherence to treatment, and life-style changes
   - Improved self-care practices (1, 5, 20, 27) and delivery of home-based health services and visits while decreasing unnecessary hospital visits and travel. (5, 14, 23)
   - Improved access to specialists through video consultations, (5, 27, 28) web sites, (18) and secure messaging. (18)
   - Improved control over blood sugar (7, 9, 10, 13, 24) and cholesterol levels. (7, 24)
   - Use of telemedicine technology is just as effective in monitoring and controlling risk factors as traditional face-to-face visits at a hospital or clinic. (8)
   - Relative to traditional hospital / clinic visits, diet and exercise improved through the use of home tele-visits with a dietician or nurse educator every 4-6 weeks resulting in a significant decrease in waist size and body mass index over a 2-year period. (12)
   - Inclusion of a telehealth educational component significantly increased the number of days that patients exercised. (20, 29)

3. Improved monitoring of risk factors
   - Increased the number of patients to regularly check blood sugar values. (2, 29)
   - The use of a dedicated in-home broadband communication device can result in more regular capturing of clinical measures. (4)
   - Inclusion of a telehealth educational component significantly increased the number of days that patients checked their feet. (20, 29)

4. Improved relations with healthcare providers and social support
   - Interventions that include collaborative goal setting were associated with improved outcomes. (16, 29)
• Seeking support from others with similar health concerns through social media networks is associated with improved outcomes.\(^{(18)}\)
• Telehealth technology can facilitate a team-based approach toward diabetes care.\(^{(8)}\)

5. Challenges
• There are technical challenges in acquiring high-quality measures of vital signs, particularly when patients provide the data. These challenges can be addressed through in-house visits by APRNs to educate patients on how to use equipment,\(^{(6, 15)}\) making the equipment easier for patients to use,\(^{(6, 11, 19)}\) and/or improving how the equipment operates to capture and transmit vital signs.\(^{(6, 11, 19)}\)
• Living in rural areas, being uninsured, and living in the South reduce the chances that diabetes patients will receive helpful information about diabetes.\(^{(3)}\)
• The needs in rural underserved areas are great. Rural Medicare beneficiaries with diabetes from federally designated medically underserved areas have significantly worse general health; more emergency room visits; more hospital admissions; and more difficulty with housework, meal preparation, and personal care when compared to overall national measures on Medicare beneficiaries with diabetes.\(^{(21)}\)
• In 2009, 6,828 adults in California had lower body amputations from complications associated with diabetes. Lower-income, rural, medically underserved areas made up hot-spots for these amputations – with rates more than 10 times those of higher-income, better served areas.\(^{(26)}\)
• Over 24 million children and adults in the United States have diabetes\(^{(21)}\) and the numbers are increasing.\(^{(21, 27)}\) High rates of diabetes and its complications are compounded in rural areas by limited healthcare access and community resources.\(^{(16, 31)}\)

Does this research fit within PCORI and AHRQ funding priorities?

This research aligns with the following three PCORI funding priorities:
• Comparative Clinical Effectiveness Research,
• Conditions that affect large numbers of people across a range of populations, and
• Residents of rural areas.\(^{(35)}\)

The project also aligns with three of AHRQ’s funding priority areas:
• AHRQ has priority interests in funding PCOR research into practice,
• AHRQ has priority interests in CER. CER projects that seek to compare different ways of organizing and delivering health care are a priority for AHRQ, and
• Rural citizens and individuals with chronic diseases such as diabetes are priority populations for AHRQ.\(^{(32)}\)

Has the research been funded by PCORI?

The titles and executive summaries of all 570 funded PCORI grants from 2012 to 2016 were reviewed.\(^{(36)}\) Any grants that included a focus on rural settings (n = 6), telehealth or telemedicine (n = 20), or diabetes (n = 15) were selected. Of the 20 projects funded by PCORI that study telehealth or telemedicine, 3 focused on diabetes:
• Benchmarking the Comparative Effectiveness of Diabetes Treatments Using Patient-Reported Outcomes and Socio-Demographic Factors, funded $2,025,244 in 2013;
• Improving Self-Care Decisions of Medically Underserved African-Americans with Uncontrolled Diabetes: Effectiveness of Patient-Driven Text Messaging versus Health Coaching, funded $5,177,150 in 2016; and

The 3 projects noted above were not targeted toward rural populations. Of the 20 projects studying telehealth or telemedicine, there have been 2 with rural populations, but the focus was on Multiple Sclerosis and Cancer:

• Comparative Effectiveness Trial between a Clinic- and Home-Based Complementary and Alternative Medicine Telerehabilitation Intervention for Adults with Multiple Sclerosis (MS), funded $5,803,149 in 2016; and
• Ostomy Telehealth for Cancer Survivors, funded $2,107,824 in 2016.

Has the research been funded by AHRQ?

A search of the AHRQ website (33) was done to investigate the current and past research that has been done related to telemedicine and diabetes care for rural patients. In order to search for AHRQ grants that were similar to the research topic under investigation, the following steps were taken:

2. Selected AHRQ Research Grants – 5864
3. Selected priority population as “rural” – 967; then entered “diabetes” in abstract text box – thirty-nine grants found totaling $15,943,962. Eight grants were found.
4. Entered “telemedicine” in abstract text box – 23 grants were found totaling $15,948,194. Two grants were found.

Additionally, a search was conducted of Research Reports from AHRQ main page: Research tab, Research Findings and Reports, then AHRQ Research Studies. Research Studies is a monthly compilation of research articles funded by AHRQ or authored by AHRQ researchers and recently published in journals or newsletters. The following keywords were used to search for any relevant studies from 2013 to 2017: rural, diabetes, and telemedicine. Five studies were found for rural, 59 were found with diabetes, and 10 for telemedicine. After reviewing abstracts and removing duplicates nine studies were found that were related to the topics of interest. (34)

Research in this topic has been funded by AHRQ:

• Telehealth interventions for diabetes self-management improved behavioral, biologic, and diabetes knowledge-related outcomes in adults with T2DM living in rural areas (Lepard, Joseph & Agne, 2015); and
• Text messaging and remote nursing were associated with improvements in 5 of 6 domains of self-care (medication taking, glucose monitoring, foot care, exercise, and healthy eating) (Nundy, Mirsha, & Hogan, 2014).
Is this study feasible to do in Georgia?

There is an existing infrastructure to support the study of telehealth and telemedicine in Georgia. The Georgia Department of Public Health has an Office of Telehealth & Telemedicine that oversees telehealth and telemedicine services, providing services to clients in remote areas using two-way, real-time technology. (37) There is also a large segment of the population in Georgia with diabetes. According to the Department of Public Health, approximately 12% of adults 18 years of age or older in Georgia have diabetes, exceeding the national rate which is below 10%. The rate has been trending up since 1993 when it was approximately 4%. (38)

Literature Search Methodology

A literature search was conducted to find studies exploring the effectiveness of telemedicine as a means of providing diabetes self-management care to a rural population. The two databases searched were PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). A timeframe of approximately 10 years was used, starting January 1, 2007 and ending January 15, 2017. Search terms included diabetes, self-care, rural, and telemedicine. Inclusion criteria were that the study be written in the English language and be either a primary peer-reviewed article or a dissertation. Searches in the CINAHL database yielded 9 articles. Searches in the PubMed database yielded 25 articles. After reviewing the titles and abstracts, 7 articles were identified as duplicates and 1 article was removed for being not relevant, resulting in 26 articles. In the process of reading the articles, 5 additional articles were identified, resulting in 31 articles that were included in evidence table.
References


36. PCOR Patient-Centered Outcomes Research Institute. Research and Results: What we’ve Funded. Retrieved from http://www.pcori.org/research-results?f%5B0%5D=field_project_type%3A298
