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UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF NURSING PRACTICE

Utilizing Telehealth Technology to Reduce Social Isolation and Depression in Seniors

by

Bohan Farrell

A Doctor of Nursing Practice Portfolio presented to the

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DOCTOR OF NURSING PRACTICE

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Abstract

Background: Social isolation in the elderly has been identified as a risk factor for poor mental and physical health, as well as higher rates of mortality, depression, and cognitive decline. Loneliness is the unpleasant experience that occurs when a person's network of social relationships is deficient in some important way, either quantitatively or qualitatively. Depression is a mental condition characterized by feelings of severe despondency and dejection, typically with feelings of inadequacy and guilt, and accompanied by lack of energy and disturbance of appetite and sleep. Physically, lonely people have more disorders, such as sleeping problems, stomach pain, and headaches. Seniors have an elevated rate of loneliness and are at greater risk for social isolation and depression. Given the overwhelming demand for care and the shortage of providers needed to treat this expanding population, telemedicine is considered an innovative way to administer care to patients and decrease feelings of isolation and loneliness. The UCLA Loneliness tool was used to measure feelings of loneliness and has been used in an estimated 80% of all empirical studies on loneliness. The PHQ-2 and PHQ-9 screening tools were used to measure participants feelings of depression. The tools measured the frequency of depressed mood and anhedonia. The PHQ-2 was utilized at every visit. The PHQ-2 has a 97% sensitivity and 67% specificity in adults and is used in primary care settings throughout the United States (Arroll, et al. 2010).

Purpose: The purpose of this EBP project was to implement telehealth senior care visits to reduce social isolation by decreasing feelings of loneliness and depression as measured by the UCLA loneliness and PHQ-2, and PHQ-9 screening tools.

EBP Model: The John Hopkins Model will be used to guide this EBP.

Project Plan Process

- Obtained Stakeholder and IRB approval
- Educated stakeholders regarding mental illness, co-morbidities, loneliness, depression, and quality of life.
- Introduced weekly telehealth visit to reduce loneliness and depression among seniors for 3 months as measured by the UCLA Loneliness Survey and the PHQ-2 and PHQ-9 screening tools.

Screening for loneliness and depression was conducted on patients in a senior living facility in Southern California over a 3-month period. The UCLA Loneliness Scale and PHQ-2 depression scale were utilized to measure the participants feelings' at baseline (Day 0), 7-, 30-, 60-, and 90 days. Pre and post data were collected using the PHQ-9 scale at Days 0 and 90.

Results: Eighty percent of patients had a decrease in depression and 60% had a decrease in loneliness over this period as measured by the PHQ-9 and UCLA Loneliness Scale. A small minority of patients (20%) had an overall decrease in loneliness and depression for the first 60 days as measured by the PHQ-2 scale and then had a spiked increase in depression and loneliness that coincided with the Christmas holidays.

Implications for Practice/ Conclusions: Loneliness and depression lead to mental as well as physical decline. The utilization of telehealth visits has a potential psychological benefit by dramatically increasing the quality of life for seniors. Additionally, it can decrease the financial burden of emergency department visits or missed appointments with their primary care provider.

Utilizing Telehealth Technology to Reduce Social Isolation and Depression in Seniors

Background and Evidence for the Problem

In the United States, the senior population continues to be one of the fastest growing demographics, comprising over 15.6 % of the total U.S. population. As of July 1, 2018, the U.S. Census Bureau estimated that over 51 million Americans were 65 years or older and many suffer from various chronic and acute physical as well as mental health illnesses. By 2030, the senior population is projected to more than double this current number (U.S. Census Bureau, 2018). Social isolation in the elderly has been identified as a risk factor for poor mental and physical health, as well as higher rates of mortality, depression, and cognitive decline (Luo et al., 2012). A survey conducted in 2012 of older Americans in the study area reported that almost half of the respondents (46%) either *strongly agreed* or *somewhat agreed* that isolation and or loneliness affected their quality of life (San Diego Association of Governments Service Bureau, 2012).

Social support in the aging population is important from a physical as well as a mental health perspective. As people age in their homes and long-term care facilities, there is a greater risk for social isolation, which can be lessened by formal or informal support networks (Banbury et al., 2017). Longer life expectancy and the costs associated with the aging population is a challenge to the health care system in optimally serving older adults with chronic diseases and the loneliness that often accompanies them. Loneliness is the unpleasant experience that occurs when a person's network of social relationships is deficient in some important way, either quantitatively or qualitatively (Van der Heide et al., 2012). Depression is a mental condition characterized by feeling of severe despondency and dejection, typically also with feelings of inadequacy and guilt, often accompanied by lack of energy and disturbance of appetite and sleep. The senior population, which has an elevated rate of loneliness and depression, is at greater risk

for hospitalization and emergency room visits (Van der et al., 2012). Many providers and health care centers have turned to telehealth technology to help keep people healthier and living in their homes longer (Banbury et al., 2017). Given the overwhelming demand for care and the shortage of providers needed to treat this expanding population, telemedicine is one way to administer care to these patients. Telemedicine also helps financially by reducing costs for patients and reducing the need for placement in care facilities, thus helping older people to remain in their homes as long as possible. The range of health and social care services delivered directly to them lessens the strain on hospital systems and other health care services (Banbury et al., 2017).

A senior living facility that provides affordable senior housing, meals, supportive services, case management and health care services to over 300 seniors agreed to participate in the telehealth evidence-based practice (EBP) project. Through ongoing resources, a pilot program utilized telehealth devices to administer visits with residents at the facility.

Evidence-Based Intervention

To track the benefits of telehealth visits in relation to decreasing social isolation by decreasing depression and loneliness that accompanies social isolation, a literature review was conducted. The review looked at loneliness and depression outcomes in healthy persons over the age of 65 who utilized telehealth devices. The review was conducted using electronic database sources for articles published from 2010-2020. These data bases included CINAHL, PubMed, and online search engines and catalogs. Keywords included *loneliness*, *isolation*, *geriatric*, *elderly*, *telehealth*, *tele-medicine*, *social support*, *videoconference*, *home care*, *randomized trial*, *telecare*, *quality of life*, *technology*, *social isolation*, *mental health*, and *telemonitoring*. The articles in the literature review included randomized control trials, systematic reviews, quasi-experimental studies, and scoping reviews.

Social isolation, depression, and loneliness were easily exacerbated as the senior population experienced profound changes in their social resources in comparison to other age groups. For example, death of relatives and spouses, functional limitations as they age, as well as a general decline in their economic well-being all had a profound impact on their mental health (Courtin & Knapp, 2017).

In multiple randomized control trials reviewed, the effect on feelings of loneliness on a 180-participant study decreased 85% when utilizing telehealth (Banbury et al., 2017; Van der Heide et al., 2012). In addition, studies reported that participants felt a sense of security and greater well-being over the telehealth treatment period (Damant et al., 2017; Gellis et al., 2014) ().

The literature revealed a dramatic drop in depressive status brought on by loneliness in older residents' care who used a video-conferencing service at a 3-month follow up visit (Tsai et al., 2010). In several instances, some older participants deliberately made false alarms to gain social contact with care practitioners (Damant et al., 2017).

Using the UCLA Loneliness Scale, one study reported scores in the experimental group that were significantly different from those in the control group at both 1 week and 3 months. This indicated that the loneliness felt in the experimental group was significantly lower than in the control group (Tsai et al., 2010).

The use of the UCLA Loneliness scale and the PHQ-9 scale to measure the pre and post visit data over the 90-day study period was the most methodical way to determine how the telehealth visits affected the participants, as supported by the literature. Telehealth services had already been shown to reduce cancellations and missed medical visits as well as gave clinicians a better view into behavior within a patient's home context (Quinn et al., 2018).

Evidence Based Practice Question (PICO Question)

Do weekly telehealth visits in adults over the age of 65 improve loneliness and depression as measured by UCLA loneliness, PHQ-2, and PHQ-9 scales over a 3-month period?

Project Plan Process

The overall aim of this project was to improve mental and physical health by utilizing telehealth technology to reduce social isolation. The project lasted 90 days and data were collected pre and post telehealth intervention to obtain baseline depression and loneliness ratings as well as ratings during the intervention. After IRB approval, two rounds of participant recruitment were conducted over a 4-week period at the senior care facility where the participants lived or frequented. A total of 15 participants agreed to participate in the study. During recruitment, participants were provided training and instructions on the use of the device and encouraged to contact friends and family during the study. The visits with family and friends were not scheduled but were tracked throughout the study. Two technology professionals helped to install the devices in the participants' homes and provided additional technical support throughout the study. Consent forms were obtained from the participants and intake forms were gathered regarding their baseline PHQ-9 scores. The project manager began weekly tele-visits with the participants to collect data on their mental health. This project used the University California Los Angeles (UCLA) Loneliness Scale, a 20-question validated tool to quantify loneliness. Additionally, the Patient Health Questionnaire, PHQ-9, a 9-question validated tool, and the PHQ-2, a 2-question validated tool, were utilized to quantify depression. Visits lasted anywhere between 5-15 minutes. In many instances, conversations about the participants' baseline feelings evolved into more mundane events that were occurring in the participants' lives. In several instances, this project manager was the primary social contact that the

participant encountered for the week. The telehealth company, which donated the tele-devices, had an interest in the EBP and requested information updates about the data obtained from the visits upon completion of the project. The telehealth company donated a total of 20 tablets for this project. Weekly visits with the participants were conducted through the video conferencing tool on the tablets.

Evaluation Results

A total of 23 patients were recruited, ranging in age from 69-94 years; 12 females and 11 males. Only 6 participants enrolled due lack of Wi-Fi-, inability to follow-up (either because participants forgot their appointments or had scheduling conflicts) and lack of technological skills. One participant passed away during the 90 days. These 6 patients were screened for loneliness and depression over the course of the 90-day project. At the end of the project, there were 4 females and 2 males ranging in age from 69-94 years old.

Pre and post data were collected using the PHQ-9 scale pre and post telehealth intervention (Table 1). During the study period, data were collected using the PHQ-2 scale and UCLA Loneliness Scale every visit (Table 2 and Table 3). On the final visit for the 6 remaining patients, 80% of the patients' depression, as measured by the PHQ-9, had decreased and 60% of the patients' loneliness had decreased as measured by the UCLA Loneliness Scale. The participants' PHQ-2 score was monitored throughout the 90-day period and scores ranged from 0-2, with the possible range from 0-6 on the scale; the higher the score the more depressed the patient. The loneliness scores ranged from 0-7 on a scale from 0-9. People with a score from 3-5 were not considered lonely and from 6-9 were rated as lonely. The PHQ-9 score had the highest possible score of 27 with the participants in this EBP project having scores range from 0-8. Additionally, primary care visits pre and post intervention were also recorded. There was an

overall decrease from an average of 3.6 visits pre-telehealth intervention to 0.7 visits post intervention (Figure 1). By using the UCLA Loneliness Scale, the PHQ-2, and the PHQ-9 to measure patients' levels of loneliness and depression in conjunction with the implementation of telehealth, this EBP project observed a decrease in patients' perceived sense of loneliness, isolation, and depression as well as a reduction in PCP visits and hospital admissions and readmissions.

Table 1

Pre/Post PHQ-9 Scores

	A	B	C	D	E	F
Pre	8	4	1	0	5	1
Post	Deceased	0	0	0	2	7

Table 2

PHQ-2 Score

	Initial	Day 7	Day 30	Day 60	Day 90
A	1	0	0	0	0
B	1	0	2	0	0
C	0	0	0	0	2
D	0	0	0	0	0
E	0	0	0	0	0
F	0	1	0	0	0

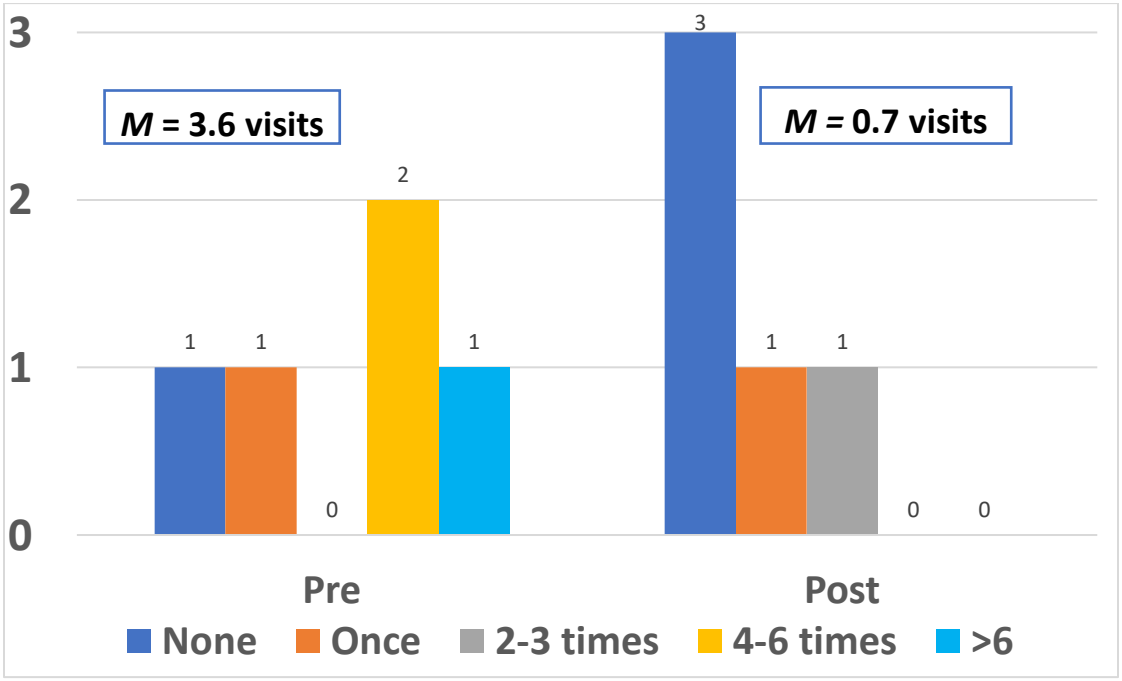
Table 3

UCLA Loneliness Score

	Initial	Day 7	Day 30	Day 60	Day 90
A	5	5	0	0	0
B	3	1	2	1	0
C	5	3	0	0	5
D	0	0	0	0	0
E	0	0	0	0	2
F	7	6	4	4	3

Figure 1

PCP Visits Pre and Post Intervention



Conclusions Including Cost/Benefit Analysis

Loneliness and the quality of feeling lonely can lead to mental as well as physical decline. Lonely people often experience reduced self-esteem, depression, and anxiety disorders. Physically, lonely people have more disorders, such as sleeping problems, stomach pain, and headaches (Van der Heide et al., 2012). Although some may consider it minor, the feeling of loneliness and subsequent depression leads to a general decline in health. The utilization of telehealth visits has a potential psychological benefit that can dramatically increase the quality of life for the senior population. Additionally, it can decrease the financial burden of admitting these persons for emergency department visits or missed appointments with their provider. Barriers for this project included lack of Wi-Fi internet within the participants residence, small sample size of participants, financial barriers for the participants, and a confounding variable (study was conducted 2 weeks before Christmas holiday) that could have affected several of the participants mood and feelings of loneliness overall.

The telecommunications devices this EBP project utilized to conduct the telehealth visits were donated by a health care technology company. These tablets facilitated patient-provider communication and decreased feelings of isolation, loneliness, and depression. Telehealth visits helped to reduce emergency department and office visits, kept residents mentally and physically healthier, and allowed living in their homes longer. The estimated cost savings was approximately $126 for every visit. Traditional visits cost an average of $176 per visit; whereas, the average virtual visit costs $40-$50 per visit (Rehm, 2016). Additionally, there is an opportunity for cost savings in that Medicare reimburses for telehealth visits under *Chronic Condition, Mental Health, and Substance Use Disorders*. The CPT code 99490 in Medicare requires 20 minutes of follow-up care per month per patient. According to the Centers for

Medicare and Medicaid Services (2018), in 2016 alone, 85.4% of all telehealth users (74,547 beneficiaries) had a mental health diagnosis. Medicare spent an average of $1,608 more a year for each older person who had limited social connections than for those who were more socially active (Flowers et al., 2017). That translated into an estimated $6.7 billion in added Medicare spending each year. Socially isolated individuals were 29% more likely to enter a skilled nursing facility and their monthly costs were $75 higher on average than those who were not socially isolated (Flowers et al., 2017).

The six participants received weekly telehealth visits free of charge. To conduct the telehealth visit, all that was required by the patient was their time and the donated device. The potential additional revenue generated by these visits would gross $42 per visit/patient for the senior residential facility based on billable International Classification of Disease (ICD) codes assigned to the visits. This averaged an additional $6,720 in billable services per month for the residential facility.

Implications for Clinical Practice - Sustainability

For this ongoing project, sustainability is vital for facilities that cater to the needs of seniors. The EBP project will continue and the telehealth device company will decide if adequate data were collected to implement regular use of the device at the facility. The facility itself has an interest in making the device more accessible to its larger population. The EBP results proved useful to improving quality of care for the senior residents in this southern California facility; telehealth follow-up visits are being considered as a service offered at the facility soon. If implemented, this EBP project will have created a permanent and sustainable change. It is important to note that, during this 90-day project, the technology in this field was rapidly changing. Telehealth companies/devices have several competitors enter into this evolving

market. Additionally, large corporations (e.g., Zoom, Apple, Amazon) have taken an interest in telehealth and the devices used to care for patients remotely. Devices such as the Apple watch can monitor EKG, heart rate, and pulse as well as having the ability to interface with a care provider from the patient's home. The future of telehealth utilization in the care of patients is rapidly evolving and constantly changing.

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