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TELEHEALTH MEDICATION ADHERENCE FOR OLDER ADULTS

Efficacy of Telehealth Modalities in Medication Adherence for Older Adults

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
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DOCTOR OF NURSING PRACTICE PORTFOLIO

by

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Abstract

About half of the geriatric population who take at least one medication find medication adherence challenging. Average adherence of an elderly patient taking one medication a day is about 80%. This adherence decreases to about 50% for patients taking medications four times a day. Nonadherence can lead to a myriad of preventable adverse effects that can reduce the quality of life and even result in death. In the United States, $100-300 billion could be saved in health care costs due to adverse effects of poor medication adherence. The purpose of this evidence-based project (EBP) is to improve medication adherence in the elderly population by utilizing telehealth technology. The aim of this project is to increase medication adherence by 90% at the end of the implementation phase. Each participant was contacted using a telehealth modality, which was Doximity's Dialer app. Each participant was asked about the medications they were taking, including dosage, route, administration times, and their understanding of why they are taking that medication. Participants were asked about any side effects or difficulties refilling medications. Participants were contacted weekly over a 12-week period and asked a series of follow-up questions, including missed doses, doctor visits, and emergency department (ED) visits/hospitalizations. Primary care providers can utilize telehealth modalities to improve patient care to: increase medication adherence, reinforce medication education, frequently monitor to enable quick and accurate patient/health care provider feedback, implement standardized assessments, tracking tools and individualized treatment, prevent hospital or ED admission related to preventable adverse effect, prevent medication toxicity.

Keywords: Telehealth, telemedicine, medication adherence, older adults, elderly, advanced practice nurse, nursing, nurse practitioner

Efficacy of Telehealth Modalities in Medication Adherence for Older Adults

The world's aging population is rapidly increasing with longer life expectancies due to greater awareness of healthy lifestyles and advancements in healthcare. However, these longer life expectancies are not without illness. As adults age, they become more susceptible to chronic and recurrent illnesses that are commonly treated with multiple drugs. These multiple drug therapies being prescribed can consist of a complex regimen, can be expensive, and have adverse reactions or drug interactions. These factors, in addition to increasing forgetfulness, and possible lack of familial and social support, places elderly patients to be at an increased risk of being noncompliant with their medications.

Polypharmacy is the use of 5 medications or more and is associated with increased risks of disability, falls, frailty, and mortality in older adults. One third of outpatient prescription spending in the United States is from older adults aged 65 years and older. They currently make up approximately 14% of the total population and this number of older adults is projected to double from 46 million to over 98 million by 2060 (Varghese et al., 2020).

About half of the geriatric population who take at least one medication find medication adherence challenging. Average adherence of an elderly patient taking one medication a day is about 80%. This adherence decreases to about 50% for patients taking medications four times a day (Wick, J. 2011). Patients may be adherent to some medications and nonadherent to others based on what they believe is good or important for them to take and what side effects they aim to avoid. Nonadherence can lead to a myriad of preventable adverse effects that can reduce the quality of life and even result in death. In the United States, $100-300 billion could be saved in health care costs due to adverse effects of poor medication adherence.

Purpose

The purpose of this evidence-based project (EBP) is to improve medication adherence in the elderly population by utilizing telehealth technology. Patient education and follow up will be provided with weekly telephone calls using Doximity's dialer app. A sample of 13 patients, 65 year old or older will be recruited for this project. The aim of this project is to increase medication adherence by 90% at the end of the implementation phase.

Framework & Model

The Iowa Model was used to guide this DNP (Doctor of Nursing Practice) project because of the simple steps and feedback loop involved. Using the Iowa model as the framework, the DNP student was able to implement an intervention, analyze the data to see if there is any significant difference, reassess the problem, and modified the intervention as needed.

This model uses feedback loops that can help improve patient care. The results of interventions being implemented were continually evaluated and the intervention was modified in order to create stronger data to make a practice change. Interdisciplinary teamwork is emphasized in this model, which can help back up research to implementing a practice change especially when initiated by frontline practitioners. A bottom-up approach can be more successful and essential when trying to implement evidenced-based change (Doody & Doody, n.d.).

This project involved a DNP Student that was able to contact the participant's primary care provider (PCP) or the registered nurse (RN) at the clinic the patients received their care from. The DNP student would contact the PCP or RN if any information retrieved from the weekly patient follow up calls warranted further intervention such as medication changes, refills, or requiring the patient to come in to be seen by the PCP thus making this interdisciplinary

teamwork model beneficial to this DNP project. A mixture of the different experiences and

specialties of the members of the team would provide valuable insight to the evaluation and

modification of the data and intervention.

Project Plan Process

In order to recruit patients from Linda Vista Healthcare Center, written agreement and

permission was needed from the medical director. After this was obtained, institutional review

board (IRB) approval through the University of San Diego was petitioned.   Once IRB had

approved the project, recruitment could begin. A list of participants that met the requirements of

being 65 years of age or older taking more then four medications was compiled. Consent was

obtained from these participants and an initial intake interview was conducted. The plan for the

project and intervention was explained to the patients and were aware that they would be

contacted weekly by phone to ask about their medication regimen. After 12 weeks of calling

each participant weekly, the data collected would be analyzed.

Evidence Based Intervention Identification

A comprehensive review of literature was completed using the following search engines:

PubMed, CINAHL, and Cochrane. Keywords utilized with each search engine were *medication*

adherence, polypharmacy, older adults, elderly, adverse effects, telehealth and telemedicine.

The search yielded over 100 results from the past 5 years from peer-reviewed publications.

Articles were ranked using Melnyk's Hierarchy of Evidence and critically appraised using

Melnyk's General Appraisal Overview. 4 articles were chosen after extensive review of the

search article yield with one being chosen from 2011 due to lack of information regarding

adherence rate in the elderly when multiple medications are added.

Al-Musawe et al. (2019) conducted a systemic review and meta-analysis on existing literature to identify the association between adverse health outcomes in elderly patients with type 2 diabetes mellitus and polypharmacy. They chose three studies out of sixteen and found polypharmacy is linked to macrovascular complications, increased all-cause mortality and hospitalizations. The article's findings suggest the need for interventions that improve the risk and benefits of polypharmacy prescribing. This article was used to support the evidence that elderly patients with comorbidities and multiple prescription drug use results in adverse events.

The objective of the study done by Lloyd et al. (2019) was to estimate the impact of nonadherence to medication among Medicare beneficiaries with chronic conditions among the population level. They enrolled Medicare beneficiaries aged 65 and older and found medication nonadherence for multiple chronic conditions led to billions in Medicare expenditures, millions inpatient hospital stays, and thousand in ED visits that could have been avoided. This article helps support the projects idea that a significant amount of healthcare costs can be saved since medication nonadherence places a large burden of resources on the Medicare fee for service program.

Wick (2011) describes the ongoing problems with prescribing multiple medications for elderly patients and identifies issues with adherence. He goes on to describe statistics of adverse outcomes and how they tend to increase when the number of medications prescribed is also increased. Wick identifies common reasons for nonadherence in elderly patients and types of nonadherence. This was useful in correlating this project's results with already known causes of nonadherence to strengthen the association between adverse outcomes related to medication nonadherence and polypharmacy.

Varghese et al. (2020) discusses issues with polypharmacy such as adverse drug effects, drug interactions, prescribing cascades, risk for hip fracture, use of over the counter complementary medications and changes in pharmacokinetics associated with aging. They suggest effective interventions to prevent polypharmacy and enhance healthcare team outcomes with effective interdisciplinary practice. This article was useful in considering interventions for practice change to stakeholders and educate prescribers and patients regarding the adverse effects of polypharmacy.

Evidence Based Project Intervention

First, the DNP student reviewed each participant's health history, including his or her medication list. The DNP student then contacted each participant using a telehealth modality, which was Doximity's Dialer app. Each participant was asked about the medications they were taking, including dosage, route, administration times, and their understanding of why they are taking that medication. Participants were asked about any side effects or difficulties refilling medications.

Participants were contacted weekly over a 12-week period and asked a series of follow-up questions, including missed doses, doctor visits, and emergency department (ED) visits/hospitalizations. The weekly data collected included calculations for the number of prescription-doses that should have been taken, doses taken, reasons for missed doses, and problem-solving suggestions to enhance compliance, if needed. Once the data was collected, it was analyzed to identify common characterizations of why the participants might not be fully compliant with their medication regimen.

Results & Evaluation

Out of the initial 13 participants that were recruited for this project, only 8 were retained for the full 12 weeks. The other 5 were removed due repeated unanswered phone calls throughout the project. Overall, the patients had a medication compliance rate above 90%, which met the project goals. Common barrier to medication adherence that were identified from the participants were insurance reasons such as not meeting the amount of days to pass in order to refill on time or prescribed medication no longer being covered, pharmacy miscommunication, feeling ill and not having the energy to remember or take their medication, or simply forgetting to take their medication. Some aids that the participants had in place to help increase medication adherence were having a designated pill box in the same location, once-a-day dosages, and having a consistent daily routine as seen in Figure 1.

Figure 1

Average Compliance by Patient
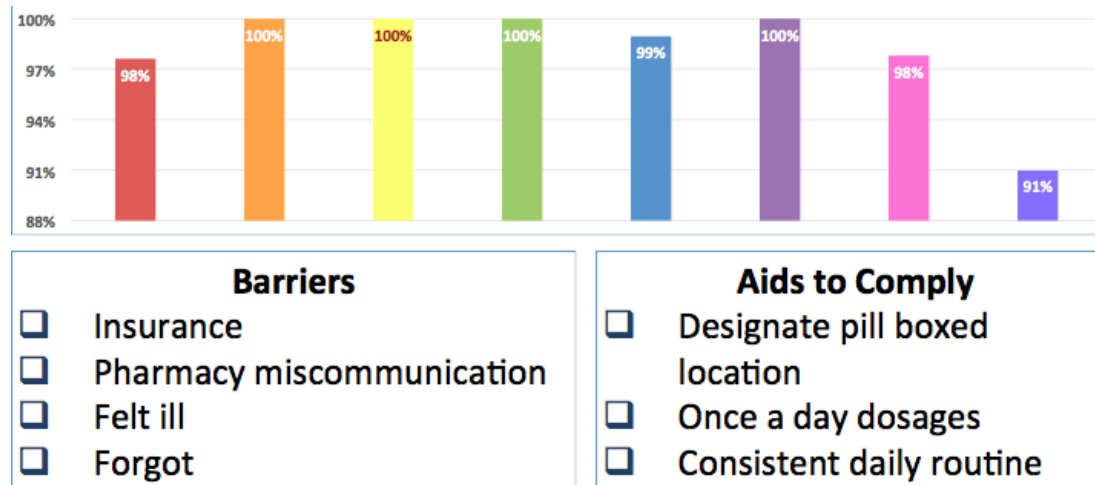
Cost Benefit Analysis for Sustainability of Project

In March 6, 2020, CMS expanded the scope of telehealth services with the 1135 waiver due to the COVID-19 pandemic. This was to ensure Americans, especially those at high-risk of

complications from the coronavirus, are able to receive care and access benefits while mitigating and containing the community spread of the virus. Under this expansion, CMS would pay for hospital, office, and other visits conducted via telehealth across the country. The providers that are eligible to bill for these services would now include nurse practitioners, doctors, licensed clinical social workers, and clinical psychologists. Before this expansion, CMS would only reimburse for patients receiving services in rural areas or when they leave their home to visit a hospital, clinic or other medical facility to receive telehealth care.

Using the Healthcare Common Procedure Coding System (HCPCS) code G2012, a patient can be billed for a telehealth virtual check in done by either audio or video call by a qualified provider that can report evaluation and management services. The patient must be an established patient, have not received any services within the past 7 days or trigger a visit within 24 hours. The virtual appointment time includes 5-10 minutes of medical discussion (Centers for Medicare & Medicaid Services, 2020).

The cost benefit analysis suggests that implementing this project into practice can make a sizeable amount of profit for the clinic in addition reducing the cost of hospital readmissions due to poor medication adherence or medication adverse effects. Thousands of ED visits, millions of inpatient hospital days, and billions of Medicare fee-for-service costs are the result of nonadherence to medication for patients with chronic illnesses. Examples of these illnesses include hypertension, diabetes, hyperlipidemia, and heart failure; many of these are illnesses older adults tend to have. In a study done by Jennifer T. Lloyd et al. (2019), they found that Medicare could save $13.7 billion annually and avoid 7 million inpatient hospital days and over 100,000 ED visits if 25% of their beneficiaries with hypertension became adherent to their prescribed medication regimen.

If a clinic were to employee a nurse practitioner (NP) at an average pay rate of $53 an

hour in San Diego County to contact 10 patients an hour, that would be about 80 patients a week

given an 8 hour work day. This would cost the clinic about $424 weekly. The cost of the patient

receiving weekly phone calls from the NP would be $0 assuming the patient has their own phone

service they already pay for. Using HCPCS G2012, the clinic can bill approximately $15 per

patient for a 10 minute or less phone call. If the NP were to call 80 patients per week, the clinic

could bill around $1,200 weekly. This could potentially lead to roughly $3,104 in profit for the

clinic, however, there are other benefits to take into consideration such as improved health

outcomes, reduced morbidity and mortality, and increased patient satisfaction as seen in Figure

2.

Figure 2

Cost-Benefit Analysis

Costs per Week
Patient (excludes phone charge) $0
Clinic – 10 calls/hr X 80 pts for
          NP @ $53/hr per week $424
Benefits per Week - Clinic
Medicare reimbursement (G2012)
          $15/pt X 80 pts/week $1,200
Net Benefit per Month - Clinic
$1,200 - $424 costs/wk x 4 wks   **$3,104**
Benefit to Patients
          Improved health outcomes
          Reduced morbidity & mortality
          Better patient satisfaction

Implications for Practice

Polypharmacy in the elderly is associated with increased all-cause mortality and inpatient

hospitalizations (AL-Musawe et al., 2019). By utilizing various telehealth modalities such as a

simple telephone call, NPs and other healthcare providers can improve patient care quality by

increasing medication adherence. These frequent phone calls can include reminders to patients

regarding taking their medication appropriately as prescribed, assess their understanding of why

they are taking each medication and to educate them on the purpose, common and uncommon

side effects, and when to contact their provider or visit an ED.

Their medical history, medication list, and use of any new supplements should also be

assessed frequently as older patients tend to receive treatment from multiple providers who are

not always in the same health network. The NP or provider should perform weekly evaluations

for the need of each medication prescribed to determine if a medication can be discontinued in

order to reduce the amount of medications being taken. This frequent monitoring of assessing a

patient's knowledge of their own medication and medication reconciliation can be done weekly

and provide patients with a frequent opportunity to ask questions and ensure they are taking their

medications properly to avoid adverse events, medication toxicity, or ED admissions.

Further research including similar studies with larger population samples in various

social economic groups needs to be done to strengthen the evidence that frequent telehealth visits

can improve medication adherence and reduce adverse events in older adults. The current CMS

1135 waiver expanding telehealth services in the country is only temporary due to the COVID-

19 pandemic. If further research was conducted, the expansion of telehealth services may

become permanent or even more extensive with more bodies of evidence to support telehealth's

positive impact in patient care.

A standardized system or tool can be created to assess a patient's understanding of their

medications and a standardized list of questions to ask for their weekly telehealth follow up. A

tracking tool could be used to visualize reasons of why a patient keeps missing their medication

and to identify commonalities between groups of patients, thus identifying a source of barriers to

adherence that can be focused. One example is the participants' common complaints regarding insurance companies coverage of their medications.

A tracking tool can also reveal if a patient is missing doses due to being prescribed several medications that need to be taken at multiple times in one day. These repeated missed doses leads to medication nonadherence and potential adverse effects. This information, if appropriately documented by a healthcare provider might be able to be submitted to insurance companies requiring prior authorizations for combination drug therapies or pills that are less frequent in dosing such as once a day pills.

Conclusion

Improper medication use affects older-adult patient outcomes including their quality of life. Proper medication adherence in older adults can significantly decrease the overall health care expenditure in the United States by reducing the frequency and length of hospitalizations as well as ED visits. In 2015, approximately $5,250 per person was attributed to nonadherence medication use. The overall return on investment from implementing this project should exceed the initial cost. This project practice change could be implemented in other primary care practices. The data collected from a larger pool of participants might identify other themes as to why older adults are nonadherent with their medication regimens.

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