

**THE EFFECTIVE MANAGEMENT OF HIGH BLOOD PRESSURE BY
IMPROVING ADHERENCE THROUGH EDUCATION**

by

Marjorie Carson

JILL SCHRAMM, DNP, Faculty Mentor and Chair

LINDA MATHESON, DNP, Committee Member

ANITA STEWART, MD, Committee Member

Patrick Robinson, PhD, Dean, School of Nursing and Health Sciences

A Capstone Project Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Nursing Practice

Capella University

June 2016

Abstract

This project assessed the effectiveness of the adoption of a policy including guidelines and training to improve antihypertensive medication adherence rates. The project determined the utilization of hypertensive clinical practice guidelines by primary health care providers. The method was to show improved rates of adherence to antihypertensive medications in patients over a 3-month period of time. The aim was to demonstrate an improvement in adherence to antihypertensive medication, subsequently showing a positive effect on the management of hypertension. This was accomplished through education provided to the primary health care providers. A policy utilizing the Joint National Committee-8 guidelines was developed and adapted into a training module and presented through 1-to-1 training to providers. The project site had an increase in adherence rates from 42% to 50%. The increased adherence indicated training to providers and health care teams is an effective way to help increase overall adherence rates.

Biosketch

Marjorie Carson has been part of the quality department of a managed care organization for 3 years. Prior to that, she was the director of oncology for a teaching hospital in the Chicago, Illinois, area, where she worked as a nurse for over 18 years. She is coauthor of a vegan recipe and wellness book with her son, David L. Carson II. Marjorie has two master's degrees: one of science in nursing and one of business administration. She is an oncology certified nurse, a certified registered nurse of infusion, a certified health coach, and a fitness nutrition specialist. Marjorie has vast experience in her past and current position with implementing quality improvement projects that are evidence based to improve the quality of care for patients. Marjorie is currently a doctoral student of nursing practice with an expected date of graduation of September 2016. She is a member of the Nursing Honor Society at Capella University.

High blood pressure has been shown to be a health risk for many adults in the United States (Heron, 2013). Research indicates high blood pressure can be effectively managed, decreasing comorbid conditions such as heart disease, strokes, and renal diseases and offering patients a better quality of life and possibly a long life span. Uncontrolled blood pressure is related to several comorbidities, including death. The comorbidities are related to poor quality of life for the member as well as increased medical costs to both the patient/member and health care organizations.

This project focused on the providers of a medical group in the Midwestern section of United States who take care of 238 members of a health maintenance organization, with 63 having a primary diagnosis of hypertension as defined by the 2014 National Committee for Quality Assurance Healthcare Effectiveness Data and Information Set Technical Specification. Of these 63 members of the health maintenance organization, only 45 had any antihypertensive medication pharmacy claims data, leaving 18 identified members not taking medication. A total of five internal medicine and family practice providers, including advance practice nurses, offer care to the 18 members identified as not having any antihypertensive medication pharmacy claims. This medical group has an adherence rate of 42%, which is lower than the overall organization's adherence rate of 47%. This subgroup was chosen to increase their rates to the overall organization's adherence rates.

The focus of this project was to educate the primary providers of the medical group who cared for members of the organization with a diagnosis of hypertension on the Joint National Committee-8 guidelines. These providers have the responsibility of diagnosing the patient, prescribing the appropriate medication, and educating the patient

on the importance of adherence to medication. Primary care providers not only often neglect to recognize medication nonadherence in their patients but also may contribute to it by prescribing complex medication regimens and do not explain the benefits and adverse effects of a medication effectively (Wood, 2012).

Inadequate communication between physicians may also be a contributing factor to nonadherence to medication. Communications between the physicians taking care of hospitalized patients such as the hospitalists and the patients' primary care providers occur in less than 20% of hospitalizations; in first postdischarge visits, it is estimated less than 34% of discharge summaries are available (Kripalani, Henderson, Jacobson, & Vaccarino, 2008). Another source of ineffective communication occurs when providers fail to obtain a history of any alternative, herbal, or supplemental therapies from their patients.

Education of the providers concerning the clinical guidelines is a key component in the management of hypertension. Identifying training and educational methods for providers concerning practice guidelines requires an assessment of the provider's needs. Factors that must be accounted for include resources and time availability. Any barriers to compliance should be identified and alleviated (Brown & Bussell, 2011). Providers should be educated and strongly encouraged to use the most up-to-date guidelines to provide the best possible care as a framework in evidence-based practice. Updated practice guidelines include prescribing aspirin, blood pressure control, cholesterol management, and smoking cessation (Stone et al., 2013). Medical guidelines were chosen from multiple peer-reviewed articles exploring the importance of cardiovascular risk reduction for all people with hypertension.

Cardiovascular disease can be a result from hypertension. Hypertension is estimated to affect 1 in 3 adults, a contributory factor to 1 out of every 7 deaths and causative factor to almost half of deaths related to cardiovascular disease in the United States (Heron, 2013). It is estimated that that 90% of people who do not have their blood pressure under control have health insurance (Heron, 2013). This percentage indicates a need for health care system improvements and education.

The prevalence of hypertension is a clinical problem that affects 1 out of 3 adults, as reported by the American Heart Association (Go et al., 2013). Data from the report show that 81.5 % of people with high blood pressure are aware they have it, 74.9 % are being treated, 52.5% have their blood pressure controlled, and 47.5 % do not have their blood pressure under control, with nearly 20% of people who have hypertension not knowing they have it. The AHA report further projects that by the year 2030, prevalence of hypertension will increase by 7.2% (Go et al., 2013). These statistics indicate that hypertension is a clinical problem for a significant percentage of adults and is expected to continue to rise, with the potential of affecting many more.

Hypertension is a precursor to cardiovascular disease that has many clinical implications, including death. In the year 2009, one of the primary causes of deaths for an estimated 400,00 from a total of 2.4 million people in the United States was high blood pressure (Go et al., 2013). The rate and management of this disease is of great importance to the clinical world and patients who have been diagnosed with the disease or have risk factors.

A study completed on medication adherence by Brown and Bussell (2011) concluded that medication adherence is multifactorial. Medication taking, or adherence

behavior, is multifacteted and specific. To improve adherence, several approaches are needed to address adherence behavior. They indicated that the success of outcomes is dependent on treatment with adherence. The study further distinguishes adherence and compliance, where adherence presumes the patient's agreement to the recommendations and compliance implies passivity. The multifactorial nature of poor medication adherence implies that only a sustained, coordinated effort will ensure optimal medication adherence and realization of the full benefits of current therapies. Several web-based resources have been developed to provide information concerning the importance of medication adherence.

A second study completed by Herttua, Tabák, Martikainen, Vahtera, and Kivimäki (2013) indicated patients who did not take their medication as prescribed showed almost a fourfold increase in the risk of dying from a stroke around the 2nd year after being prescribed medication to control their blood pressure, and a nearly threefold increased risk in the 10th year as compared with patients who were taking their medication as prescribed. The study further noted that patients who did not take their medication had a 5.7-fold higher risk of dying from a stroke as compared to patients who took their medication as prescribed. In addition, the patients who failed to take their medication appropriately had an increase to be admitted to the hospital after a stroke. These patients' risk of hospitalization increased to 2.7-fold in the 2nd year after being prescribed antihypertensive drugs as paralleled with adherent patients; in the 10th year, it was 1.7-fold higher. In the same year patients had a stroke and were admitted to the hospital, their risk was shown to be twofold higher than patients who were adherent to their medication. These conclusions by the researchers accentuate the need for patients to

take their antihypertensive medication as prescribed to help reduce the risk of both fatal and nonfatal strokes. Patients who are nonadherent to their medication increase their risk up to 10 years before they suffer a stroke. A dose–response relationship was also noted in the study, indicating the worse patients are at taking their antihypertensive therapy, the greater their risk of a stroke, heart attack, and heart disease (Herttua et al., 2013).

The AHA estimates high blood pressure contributes to approximately 1,000 deaths per day in the United States (Go et al., 2013). The high rate of death and complications is indicative of the need for better control and management of this disease. Hypertension management is time consuming and multifactorial, and should involve screening, education on medication adherence, self-monitoring, risk factors, and utilization of the most updated practice guidelines from evidence-based practice.

Method

This project’s method encompassed looking at adherence rates prior to education and posteducation to measure the success of an intervention. A policy utilizing the Joint National Committee-8 guidelines was developed. This policy was adapted into a training module and presented through one-to-one training to providers. Barriers were discussed with the providers to address any obstacles in prescribing medication and educating members on adherence. Talking points were further established to make sure the same message was conveyed to the members. The importance of increasing patient adherence was emphasized and the providers came up with ways of persuading the patients to adhere to their medication regimens.

The outcome measure was to evaluate pharmacy antihypertensive medication claims data to determine if there was an increase postintervention to measure the success.

Literature indicates the comprehensive availability of electronic pharmacy data. Patients' adherence behavior at different phases can be attained by viewing how the patients obtain their refills and the frequency of the refills. This information can be obtained through refill data and has shown to relate to a wide range of outcomes for the patient (Bryson, Au, Young, McDonnell, & Fihn, 2007). The medication possession ratio and proportion of days covered methods measure medication adherence that is based on pharmacy data. The proportion of days covered method is the number of doses dispensed in a specified period (Ho et al., 2008). The proportion of days covered was utilized in determining the adherence rates. In the organization in which this project took place, the current adherence rate is 47%. This rate is lower than the national average, indicating a need for intervention.

Lewin's (1947) change model was utilized for the project. Lewin's change model identifies three components: unfreezing, movement, and refreezing. These stages are important for any change to be effective. The unfreezing phase for the providers occurred when they engaged in the nominal group technique (NGT) brainstorming exercise. The importance of increasing patient adherence was emphasized and the providers came up with ways of persuading the patients to adhere to their regimens. The movement began when the new policy was implemented and the refreezing was the result of continual monitoring of providers' compliance with the policy over time.

A parallel process happened for the patients. The unfreezing occurred when the new policy was implemented by the providers and patients better realized the importance of following the prescribed regiment. The movement phase began when patient

adherence increased, and the refreezing occurred as the provider continually monitored patient adherence over time.

Implementation

An initial appointment was set up with the providers to discuss the project and conduct an NGT exercise. Ideas for improvement were brainstormed and identified as part of the unfreezing phase.

The next phase was accomplished by developing a policy and training with an interprofessional team for providers who care for the members who have been diagnosed with hypertension. This training and policy focused on the benefits of adherence to hypertensive medication. The medical director, the clinical pharmacist, and quality management specialists developed a policy and training that provided information concerning the recent Joint National Committee-8 hypertension guidelines in prescribing appropriate medications, a list of hypertensive medications that are covered by the plan, preauthorization forms required if the medication prescribed is nonformulary, and contact information for any questions. This part was considered the movement phase, in which people start to believe and act in ways to support the new direction.

The pharmacy clinical manager monitored gaps in prescription refills quarterly and notified the providers by letter or telephone call if gaps were identified. The letter/call reminded providers of the importance of prescribing medications and helping to identify any barriers in prescribing antihypertensive medication and educating the members on their medication. This was the refreeze phase towards helping the provider institutionalize the changes of prescribing the appropriate medications and educating members on antihypertensive medications.

Setting

The setting was in the organization and providers' offices and included face-to-face and telephone conversations, and webinars. The organizational setting was appropriate to meet with the interdisciplinary departments, plan, develop the policy and training, monitor hypertension medications adherence rates, discuss next steps, make appointments, send out letters, and discuss the project with key stakeholders. The providers' office and webinars were appropriate settings to complete the NGT exercise and training. This also was an opportunity to answer any questions and help determine and alleviate any barriers in prescribing antihypertensive medication.

The organization had been tasked by the state in which it operates to develop an initiative to effectively manage their members who had been diagnosed with hypertension. The organization was open to initiatives to help fulfill this obligation to the state. The success of this project was found to be beneficial to both the organization and members. This project has the capacity to save the organization thousands of dollars in health care costs and help the members to live a better quality of life by reducing emergency room visits and hospitalizations, and providing a sense of feeling better.

Design

The action research design was utilized in this project. Action research is considered a thoughtful process about research in action (Herr & Anderson, 2005). It involves real-world situations and problems. It is a continually evolving method of investigation conducted within familiar settings by teams working together for the resolution of practice or problem (Herr & Anderson, 2005). This is a relevant clinical problem because hypertension is a real-world situation with an estimated one third of the

population being diagnosed with this condition. This kind of research is done by and with insiders, those central to and conversant with the areas to be researched (Herr & Anderson, 2005). Insiders from different departments within the organization participated in the project. These departments were considered key stakeholders in the success of the project.

Rather than dwelling on the theoretical, action research allows practitioners to address real-life concerns over which they can exhibit some influence, and have the ability and authority to make needed change (Herr & Anderson, 2005). In essence, action research is a deliberate, solution-oriented investigation characterized by a circular process of problem identification, data collection, analysis, reflection, data-derived action, evaluation, further reflection, and problem redefinition (Herr & Anderson, 2005). The model is similar to the nursing process, which includes assessing, planning, implementing, evaluating, and replanning (Glasson, Chang, & Bidewell, 2008). Action research is based primarily on the assumption that practitioners at immediate and tangible levels are best able to identify, understand, and find solutions for practice problems. A practice problem was identified indicating a need for education and reinforcement of evidence-based guidelines. The premise of the project was to educate, reinforce, and provide support on all levels to ensure the members' involvement in the care of their health. The members' involvement was accomplished by educating them on the importance of taking their medication as prescribed by everyone involved in their care, which includes their health care providers, nurses, nursing assistants within the office practice, and care managers. This project also included educating the providers on evidence-based guidelines concerning hypertensive medication and recommended that

they encourage the members' adherence to their medication. The principles for the action research model were best suited for this project.

Sample

Sixty-three members were identified with a diagnosis of hypertension as defined by the Healthcare Effectiveness Data and Information Set measure for ages 18–85 who have a blood pressure of < 140/90 mm HG and a diagnosis of hypertension, age 60–85 with a diagnosis of hypertension and diabetes with a blood pressure < 140/90 mm HG, or age 60–85 with a diagnosis of hypertension only with a blood pressure < 150/90 mm HG in the identified program being treated at a specific medical group with a low medication adherence rate. Of these 63 members of the health maintenance organization, 18 did not have any hypertension claims data. The NGT exercise was conducted on only the primary health care providers who treat the 18 members at the project's location. Training was provided to these providers and their nurses along with the care managers who take care of these members/patients.

Criteria

Patients who are treated at the facility that were identified in one of the managed care organization's Medicaid product and have been diagnosed with hypertension as defined by the Healthcare Effectiveness Data and Information Set measure and ages are 18–85 were included in the patient sample. The health care providers, including their nurses and care managers who cared for and managed these members, were included in the sample. All others were excluded.

Recruitment

Recruitment of the providers entailed identifying the providers, nurses, and care managers who treat and care for the members. Meetings were set up to discuss the project—detailing the NGT exercise, guidelines, training, and expected outcomes—and to request their participation.

Limitations

The biggest limitation encountered was the availability of all providers identified at the project's facility and in the organization to complete the NGT exercise and training at one time. This was managed through the organization's provider network consultant and the medical directors from both the medical facility and organization. After several communications, two training sessions were completed with all identified providers in attendance. The medical director from the organization, the clinical pharmacist, and the project leader were all part of the training sessions. This multidisciplinary approach was helpful to address barriers to not prescribing antihypertensive medication and reinforce solutions.

A separate training was completed with the care managers at the organization who are responsible for managing the disease process of the members. The training to the care managers had to be completed with one-on-one communication and training because of their availability. Five training sessions were conducted with these nurses to accommodate their schedules. In these sessions, the project was discussed along with the importance of the members' being adherent to their medication and treatment.

Results

Data were collected through hypertensive claims data to determine adherence rates. The organization utilizes an outside agency that tracks and distinguishes claims according to specific medications and appropriate claims. The hypertension claims data were collected preeducation, analyzed for accuracy, and collected again post education and analyzed for accuracy. These two sets of data were analyzed for increases or decreases in adherence rates. A *t* test was utilized to determine if the implementation of education to the health care providers had an effect on adherence rates.

Initially, adherence rates were measured for 18 members who prior to the project had no claims data for antihypertensive medications. After further investigation, two members were found to have their blood pressure effectively managed through lifestyle changes and five others fell out of the project because they were no longer patients and members of the organization. A total of 11 members remained in the project and were followed. In the initial month after implementation, 9 of the 11 members had claims data indicating that the members filled their prescriptions ($P < .05$). Reinforcement was then provided to the members by their care managers and in the 2nd and 3rd months, 100%, or all 11 members, had filled their antihypertensive medications ($P < .001$). The overall adherence rate of the organization in the project increased to 50% from 42%, exceeding the goal of this project.

Discussion

The results indicate that training of providers and the health care team is an effective way to help increase overall adherence rates from 42% to 50% for the facility, which is a statistically significant difference, exceeding the goal of this project. This was

an interprofessional approach to educate the provider to prescribe the appropriate medication as indicated by the Joint National Committee-8 evidence-based guideline. The health care team had communication with the patients to reduce barriers in filling and taking their antihypertensive medication and encourage the members to follow the treatment as prescribed. The nurses were provided talking points to further reinforce the treatment plan and encourage the patients to discuss any barriers. The provider's nurse was able to reinforce what was said in the visit and make sure the prescription had been written and forwarded to the patients' preferred pharmacy. The patients' care manager was able to follow up with the members after the provider's visit to educate and make patient-centric goals to follow the treatment plan and take their medication as prescribed. The care managers also were able to provide free home blood pressure monitors to the members as one of their benefits under their managed care organization. Monitoring was strongly encouraged along with reporting results to their provider. The care managers were also able to discuss barriers and help to alleviate them to help the members be successful in following the treatment plan.

Nursing played a vital role in educating the patient, reinforcing the treatment plan, establishing goals, and identifying and helping to alleviate barriers in filling and taking antihypertensive medication to increase success. Nursing showed a direct impact on the patients' filling their antihypertensive medication as indicated in Months 2 and 3. The value these results add to the nursing field is the importance of the interdisciplinary team having the same goals of effectively managing a condition.

Recommendations include continuing to follow the claims data to ensure patients are obtaining their antihypertensive medications and for the pharmacy's continuing to

mail reminders to providers when there are gaps identified in patients' filling their antihypertensive medication. Another recommendation includes monitoring patients' blood pressure through the provider and self-monitoring to ensure that members' blood pressure is effectively managed through adherence. The information gained from the project will add to current research and help provide safe quality patient care by effectively managing hypertension through education to providers and members as measured through adherence rates of hypertensive medication.

REFERENCES

- Brown, M. T., & Bussell, J. K. (2011). Medication adherence: WHO cares? *Mayo Clinic Proceedings*, 86(4), 304–314. doi:10.4065/mcp.2010.0575
- Bryson, C. L., Au, D. H., Young, B., McDonnell, M. B., & Fihn, S. D. (2007). A refill adherence algorithm for multiple short intervals to estimate refill compliance. *Medical Care*, 45(6), 497–504. doi:10.1097/mlr.0b013e3180329368
- Glasson, J. B., Chang, E., & Bidewell, J. M. (2008). The value of participatory action research in clinical nursing practice. *International Journal of Nursing Practice*, 14(1), 34–39. doi:10.1111/j.1440-172x.2007.00665.x
- Go, A. S., Roger, V. L., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D., Borden, W. B., & Turner, M. B. (2013). Heart disease and stroke statistics—2013 update: A report from the American Heart Association. *Circulation*, 127(1), e6–e245. doi:10.1161/CIR.0b013e31828124ad
- Heron, M. (2013). Deaths: Leading causes for 2010. *National Vital Statistics Reports*, 62(6). Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_06.pdf
- Herr, K., & Anderson, G. L. (2005). *The action research dissertation*. Thousand Oaks, CA: Sage.
- Herttua, K., Tabák, A. G., Martikainen, P., Vahtera, J., & Kivimäki, M. (2013). Adherence to antihypertensive therapy prior to the first presentation of stroke in hypertensive adults: Population-based study. *European Heart Journal*, 34(38), 2933–2939. doi:10.1093/eurheartj/eh219
- Ho, P. M., Magid, D. J., Shetterly, S. M., Olson, K. L., Maddos, T. M., Peterson, P. N., . . . Rumsfeld, J. S. (2008). Medication nonadherence is associated with a broad range of adverse outcomes in patients with coronary artery disease. *American Heart Journal*, 155(4), 772–779. doi:10.1016/j.ahj.2007.12.011
- Kripalani, S., Henderson, L. E., Jacobson, T. A., & Vaccarino, V. (2008). Medication use among inner-city patients after hospital discharge: Patient-reported barriers and solutions. *Mayo Clinic Proceedings*, 83(5), 529–535. doi:10.4065/83.5.529
- Lewin, K. (1947). Frontiers in group dynamics: Concept, method and reality in social science; Social equilibria and social change. *Human Relations*, 1(1), 5–41. doi:10.1177/001872674700100103
- Stone, N. J., Robinson, J. G., Lichtenstein, A. H., Bairey Merz, C. N., Blum, C. B., Eckel, R. H., . . . Wilson, W. F. (2013). ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults. (2013). *Circulation*, 129(25, Suppl. 2). doi:10.1161/01.CIR.0000437738.63853.7a

Wood, B. (2012). Medication adherence: The real problem when treating chronic conditions. *U.S. Pharmacist*, 37(4, Compliance Suppl.), 3–6. Retrieved from <https://www.uspharmacist.com/article/medication-adherence-the-real-problem-when-treating-chronic-conditions>