Motivational Interviewing Impact on Cardiovascular Disease

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Abstract

Harm reduction in cardiovascular disease is a significant problem worldwide. Providers, families, and healthcare agencies are feeling the burdens imparted by these diseases. Not to mention missed days of work and caregiver strain, the losses are insurmountable. Motivational interviewing (MI) is gaining momentum as a method of stimulating change through intrinsic motivation by resolving ambivalence toward change (Ma, Zhou, Zhou, & Huang, 2014). If practitioners can find methods of educating the public in a culturally-appropriate and sensitive manner, and if they can work with community stakeholders to organize our resources to make them more accessible to the people, we may find that simple lifestyle changes can lead to risk reduction of cardiovascular diseases. By working with our community leaders and identifying barriers unique to each population, we can make positive impacts on a wide range of issues that markedly impact our healthcare systems.

Keywords: Motivational interviewing, hypertension, risk reduction, harm reduction, cardiovascular events, community, population, self-management, self-efficacy, behavior change, lifestyle change, Chronic Care Model, Social Cognitive Theory

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Hypertension occurs in 1 in 3 Americans, making this the most common condition treated in primary care (Kravetz & Walsh, 2016; Office of Disease Prevention and Health Promotion, 2019). Providers are struggling with reducing cardiovascular risk factors, and they cannot understand why. Matters are further complicated when patients have poor medication adherence, low socioeconomic status, cultural or language barriers, and lack of exercise and healthy eating habits. Patients may struggle with the ability to afford their medications, sometimes choosing to cut their pills in half or not refill their prescriptions so that they can put food on the table. Others may have difficulty reaching a pharmacy or grocery store.

Background and Significance

Incidence and Prevalence

With a recent change in the national guidelines to now consider hypertension 130/80 or above, an already flooded healthcare system will now be inundated with new hypertensive patients, and those already on medication will need tighter control (Ioannidis, 2018). According to the World Health Organization (2019), the global prevalence of hypertension in adults aged 25 and over was around 40% in 2008; nearly one billion. The Centers for Disease Control and Prevention (2017) estimates that 33.2% of adults aged 20 and over have hypertension. During 2015–2016, the prevalence of hypertension in the United States was 29.0% and increased with age (Centers for Disease Control and Prevention, 2017). In Arizona, 22.3 percent of the adult population reported they had high blood pressure in 2005 (Arizona Department of Health Services, n.d.).

Compliance

Up to 54% of patients do not take their medications as prescribed (Centers for Disease Control and Prevention, 2017; Kravetz & Walsh, 2016; Office of Disease Prevention and Health Promotion, 2019). It is in the interest of patients, insurance agencies, federal organizations, and communities to prevent complications of hypertension. Such complications include heart attack, stroke, cardiovascular disease, sick days and caregiver strain. Efforts are directed at increasing compliance with medication adherence and lifestyle modifications, such as diet and exercise (Ma, Zhou, Zhou, & Huang, 2014). It is the responsibility of healthcare providers to determine what kinds of barriers are preventing patients from seeking or maintaining their health and wellness. It is also the duty of each member of the healthcare team to work with the patient and their support system to implement a plan of care that is achievable and culturally competent (Zaccagnini & White, 2017). Hypertension is also known as the silent killer, which makes this a larger threat to the nation, as many are unaware that they are suffering from this disease. It is important that methods of addressing this healthcare crisis be further evaluated.

Purpose and Rationale

Half of all Americans suffer from some form of cardiovascular disease (American Heart Association, 2019). In 2016, heart disease was the number one cause of death in the United States (American Heart Association, 2019; Office of Disease Prevention and Health Promotion, 2019). Hypertension can lead to heart disease and stroke, which is why it must be addressed (American Heart Association, 2019). A primary school district in Arizona has identified risk reduction of cardiovascular events as a problem. This school is interested in harm reduction interventions. Lack of education, patient compliance, and scarcity of resources have led to poor outcomes regarding heart disease in this population. Simple interventions, such as limiting sodium intake, can significantly improve cardiovascular measures, but have

failed to do so (Office of Disease Prevention and Health Promotion, 2019). Key stakeholders are receptive to trialing any means necessary to improve cardiovascular disease. Much research has already been done on hypertension management and yet implementation has failed to make significant improvements nationally. Treating each community with a unique and tailored approach to risk reduction may yield greater impacts in the field of chronic disease management.

Studies suggest that if blood pressure is kept below 130/80, patients will have better outcomes (Ghazi & Oparil, 2018; Kirk, Allsbrook, Hansell, & Mann, 2017). Depending on age and other factors, such as cardiovascular comorbidities, goals for hypertension management were variable until the recent guideline recommendations changed (American Heart Association, 2019; Kirk et al., 2017). The American Heart Association, along with the American College of Cardiology (2017) now recommend a blood pressure goal of 130/80, regardless of age or comorbidities. However, treatment for hypertension still varies based on patient and provider preference (American Heart Association, 2017). Providers may remain weary over treating an elderly patient with multiple risk factors the same way they would treat a young adult with few risk factors who also has hypertension. Practice guidelines do not always reflect data from recent clinical trials, and provider skill level varies widely (American Heart Association, 2017; Kirk et al., 2017). Goals include reversing the increasing magnitude of heart disease through the modifiable risk factors of hypertension, high cholesterol, cigarette smoking, diabetes, exercise, stress management, and weight management (Office of Disease Prevention and Health Promotion, 2019).

Questionnaires asking teachers to rate their experience of stress at work typically indicate that about a quarter of schoolteachers regard teaching as a `very or extremely stressful'

job (Kyriacou, 2001). It has been well documented that teachers have a higher prevalence of anxiety, hypertension, headaches, psychosomatic disorders and cardiovascular diseases compared with other workers (Yang et al., 2009). Targeting one or more of these risk factors would make a significant impact on the $320 billion spent yearly on cardiovascular disease (Office of Disease Prevention and Health Promotion, 2019). In addition to being financially responsible, improvements in blood pressure would lead to decreased morbidity and mortality, and improved quality of life (Office of Disease Prevention and Health Promotion, 2019). In a recent meta-analysis of randomized controlled trials, there was a 20% reduction in CVD events, 27% reduction in strokes, and 28% reduction in heart failure for every 10 mm Hg decrease in systolic blood pressure (Ghazi & Oparil, 2018). This means that even slight decreases in blood pressure can make a large difference. When authority figures model healthy behaviors, such as weight management and mindfulness, their peers are more likely to mirror their good habits.

Internal Evidence

A school district in rural Arizona has found harm reduction to be a significant problem worth addressing. Individuals diagnosed with cardiovascular risk factors are very diverse, with a larger percentage of Hispanics. Hispanic Americans and African Americans have disproportionate rates of uncontrolled hypertension compared to Caucasians (American Heart Association, 2019; Davidson et al., 2015; Office of Disease Prevention and Health Promotion, 2019). Often, the patients seen in this setting are on AHCCCS, Medicare, or uninsured. The school is in a rural area, where public transportation is virtually nonexistent. Large grocery stores are present, but healthier food choices are infrequent and unaffordable to most of these clients. Barriers to cardiovascular disease include transportation to doctors, grocery stores, and

pharmacies. Poor dietary choices, lack of exercise, and medication nonadherence are frequent concerns noted by key stakeholders. Language barrier, poor compliance with the plan of care, and low socioeconomic status are other challenges with this population. The sweltering heat, along with lack of safe recreational facilities and reliable transportation are frequent concerns. The school principal is interested in implementing an intervention that could positively impact the teachers through positive learned behaviors and could decrease cardiovascular risk factors.

PICOT

In adults with hypertension, how do brief harm reduction strategies (motivational interviewing, dietary and exercise guidance) compared to standard of care affect lifestyle behaviors and risk reduction over 3 months?

Search Strategy

Databases

An exhaustive search was conducted using the following academic data bases: PubMed, Wiley Online, EBSCO, CINAHL, Cochrane, PsycINFO, and Google Scholar for grey literature. Initial database searches in the Cochrane database yielded 104,810 results, but the 7th revision of search terms narrowed the results down to 2,342. An EBSCO search gave 90,905 hits, but by the 8th revision there were 66 relevant articles. One of the PubMed searches resulted in 8125 initial hits and ended in 61 results, which was much easier to navigate and yielded more appropriate results. The final PubMed search yielded only 27 articles, but they were the most relevant.

Search Terms

A keyword search was first conducted to assess the utility of the PICOT question. Later, a subject headings search was performed, using MeSH terms delineated from the

keyword search. The search terms used included motivational interviewing, directive counseling, patient education, educators, teachers, behavior change, behavior modification, behavior intervention, lifestyle change, lifestyle intervention, lifestyle modification, lifestyle counseling, self-management coaching, drugs, medication adherence, blood pressure, high blood pressure, cardiovascular disease, risk factors, hypertension, rural or underserved populations, low income, medication, medication management, pharmacology, pharmacotherapy, prescription, North America, Canada, or United States, decrease blood pressure, improve blood pressure, English, last 5 years, published in the last 5 years.

Mesh Terms

Mesh terms included Motivational Interviewing, Directive Counseling, Patient Education as Topic, Lifestyle, and Hypertension. Changing key terms and limiting or expanding the search to find the most relevant results was necessary and needed to be adjusted with each database search. Guidelines reflect the probability that factors such as high blood pressure are affected by genetics, and therefore studies that focused on populations similar to my own were preferentially selected.

Inclusion and Exclusion Criteria

Exclusion criteria were sometimes limited to data from other countries, as the patient population may have differed too greatly. Another limiter was age of study, which was focused on the last 5 to 10 years, unless they were guidelines or imperative articles. Generally, inclusion criteria for most studies consisted of a certain age range, usually middle-aged to older adults, without other chronic conditions that could confound the results, such as dementia, congestive heart failure, or COPD. In most cases, the patients must be able to provide informed consent. Some studies limited subjects to those on one antihypertensive medication, while

others allowed for polypharmacy subjects. Preference was given to studies that focused on rural, low-income, or disadvantaged populations, but this was not part of the inclusion criteria. Gender, education, occupation, religion, and other sociodemographic factors were often mentioned but not listed as inclusion or exclusion criteria.

Critical Appraisal and Synthesis of Evidence

A systematic review of 10 randomized controlled trials was conducted. As the highest level of evidence, these studies should guide further practice (Melnyk & Fineout-Overholt, 2015). All of the articles focused on reduction of cardiovascular disease risk factors, such as hypertension. Some articles also looked at stroke prevention and hyperlipidemia (Barker-Collo et al., 2015; Hedegaard et al., 2015). Most of the studies used motivational interviewing techniques to illicit medication adherence. Although not all of the studies yielded statistically significant results for every variable they measured, the findings were still clinically significant because there was little risk to the patient and hypertension management is multifactorial. Few studies referred to cost involved, though providing basic education at every patient encounter should be the expectation in healthcare. An intent-to-treat approach was utilized, and thus the controls were still given standard care, which is likely why many factors were not found to have statistical significance between the intervention and control groups (Barker-Collo et al., 2015; Boutin-Foster et al., 2016; Carter et al., 2015; Schoenthaler et al., 2015). While most of the research was completed in the primary care setting, some research was carried out in other areas, such as inpatient settings by pharmacists (Stewart et al., 2014). Generally, the data suggests that a culturally appropriate intervention that focuses on harm reduction through education and support will at least be mildly successful. Some of the articles reached a generalizable population, while others concentrated on a very rural or underserved population, which was my

focus (Appendix B). Motivational interviewing (MI) was used widely across the studies as an intervention, because it is useful in helping to change lifestyle behaviors among many chronic diseases (Barker-Collo et al., 2015; Boutin-Foster et al., 2016; Friedberg et al., 2015; Ogedegbe et al., 2008). However, there was great variability in how the MI was delivered and whether or not other factors were controlled for. For instance, some MI was performed as a standardized process in clinic settings, while other researchers executed MI over the telephone (Barker-Collo et al., 2015; Boutin-Foster et al., 2016; Carter et al., 2015; Friedberg et al., 2015; Hedegaard et al., 2015). Timelines for implementing the intervention varied by study. Yet another variable scrutinized was perceived quality of life, and the ability to manage one's own health (Boutin-Foster et al., 2016). In these studies, MI was a good tool to help the patients feel supported and competent in positively changing their behaviors.

While MI has inconsistent results in regard to behavior change associated with cardiovascular disease, many argue that this method is beneficial due to the knowledge imparted and low risk posed to the participants. Many studies support standard patient education delivered in a culturally sensitive manner for optimal effect. In this rural community of educators, an informational program tailored to the needs of the population was delivered based on the findings of numerous successful outcomes in the literature review mentioned above. This intervention was chosen based on previous models where low income, rural participants were successful in achieving risk reduction measures, such as lowering blood pressure.

Theoretical Framework

Bandura's Social Cognitive Theory (Appendix C) was chosen as it has been widely used to illicit behavior change across disciplines. The theory implies that a person's individual

characteristics may be shaped by interactions, the environment, or by observing others (Bandura's Social Cognitive Theory, 2003). Improving self-efficacy is a hallmark of Bandura's Social Cognitive Theory (2003). Through mastery, social modeling, social persuasion, and physical and emotional states, we can work to develop efficacy (Bandura's Social Cognitive Theory, 2003). Those who are able to develop self-efficacy are more likely to believe they have the power to make desirable changes through their own actions (Bandura's Social Cognitive Theory, 2003). Efficacy is a personal judgement of one's own capability and is not to be confused with self-esteem (Bandura's Social Cognitive Theory, 2003). Social cognitive theory describes how humans acquire information and competencies, along with what motivates and regulates their behavior (Bandura, 2012). It also helps to explain how modeling the behaviors we see in others, good or bad, shape our subjective reality (Bandura, 2012). It makes sense that culture, motivation, pressure, and influence on our thoughts and actions might cause us to react or fail to react. The way in which we perceive our surroundings and our emotions are other strong pulls to action, or lack thereof. If we can understand what motivates our patients, what inspires them, and how-to best model that behavior for them, we might find that less time and effort will be required to evoke the change we seek. Theories may be used to guide the study and are particularly useful for describing social norms (Melnyk & Fineout-Overholt, 2015). Theory is used to inform practice, and there exists a continual relationship between theory, research, and practice (Moran, Burson, & Conrad, 2017). They are particularly relevant when describing social phenomena, and when studying population health patterns and evaluating interventions (Moran, Burson, & Conrad, 2017).

Evidence Based Practice Model

The JBI Model was selected for its utility to the PICOT question. This model (Appendix D) has been used when sensitivity to a particular population is concerned (Pearson, Wiechula, & Lockwood, 2005). This model works nicely with the Social Cognitive Theory as it focuses on patient and provider knowledge and experience in clinical decision making (Pearson, Wiechula, & Lockwood, 2005). Utilizing the resources guided by the JBI Model for patients in this rural area would be unique and welcomed by the populace, who may not want to adhere to traditional methods of cardiovascular risk reduction. As providers, we could show empathy and compassion by offering resources and information that is culturally sensitive and does not fit with the traditional medicine model. Serving as an information source or linking clients to healthy foods and affordable healthcare is vital. This model requires engaged practitioners, who are motivated to make a difference through various means. They may need to rely on community stakeholders and advocate for their clients, since evidence-based healthcare may not always align with the goals in the community served (Pearson, Wiechula, & Lockwood, 2005). Healthcare evidence generation, evidence synthesis, knowledge transfer, and evidence utilization are components of the JBI model (Pearson, Wiechula, & Lockwood, 2005). Since the needs of the population are beyond that of any single health profession, advanced practice nurses will need to be astute to the barriers associated with wellness and focus on interprofessional collaboration to meet the needs of the people (Zaccagnini & White, 2017). Collaborating as healthcare providers with educators in the community can potentially make a larger impact than targeting individual patients who already have disease. The JBI model was utilized to develop a unique and tailored intervention that focused on the needs and desires of the population and site. Key stakeholders were involved in project implementation and delivery to enhance participation and limit attrition.

Methods

IRB Approval

The project was approved by the Buckeye Preschool Principal and the Arizona State University (ASU) IRB.

Ethical considerations and human subject protection

No personal identifying information was collected from participants. Only the principal investigator and co-investigator (ASU faculty) had access to the data. Participants were asked to give informed consent during the enrollment period. Agreement to participate in the project and complete the surveys was considered as the consent to access the participants responses.

Budget

All costs associated with this intervention have been the responsibility of the primary investigator. No funding was received to develop or complete the project.

Risk to participants

There is no known risk to participants who chose to complete the program.

Population and setting

Buckeye Preschool District staff over the age of 18 who were willing and able to give consent were invited to participate. No effort was made to identify special populations for either inclusion or exclusion. Teachers and educators were targeted for recruitment. Participants must be able to read and write in English. Exclusion criteria include age less than 18 years, non-English speaking, and not able or willing to provide consent.

Project description and timeline

Participants were recruited beginning October 14, 2019 via email and word of mouth from the Buckeye Preschool Principal. Upon informed consent, The Quality of Well-being scale- self-administered version (QWB-SA) and the General Self-Efficacy Scale were both used as pre-intervention surveys to gain an understanding of baseline health assessment. Participants had 12 weeks to complete the online educational program and contact the investigator with any questions. Upon completion and at their leisure, participants again took the (QWB-SA) and the General Self-Efficacy Scales to assess for project impact.

Data analysis

Data was stored and analyzed in Microsoft Excel and *Intellectus Statistics*®. Surveys were collected online via Survey Monkey. Descriptive statistics were used to analyze pre and post survey responses to the QWB-SA and the General Self-Efficacy Scale. A two-tailed Wilcoxon signed rank test was conducted to examine whether there was a significant difference between the pre and post survey results. The Wilcoxon Signed Rank test is a non-parametric test used to assess for significant differences between two scale or ordinal variables that can be matched. Typically, the variables are matched by time (such as pretest vs. posttest), but the data can also be matched by other characteristics (such as husband vs. wife). This test ranks the pairs of scores by the magnitude of the differences between each matched pair, then sums the signed ranks to compute the *V* statistic (Intellectus Statistics, 2020). The *V* statistic is then used to compute *z*, which in turn is used to compute the *p*-value, the significance level (Intellectus Statistics, 2020). A significant result for this test suggests that the two matched variables are reliably different from each other. The Wilcoxon Signed Rank test assumes that the variables under investigation are scale or ordinal level. A p value < 0.05 was used for statistical significance.

Results

Descriptive Statistics were used to analyze the following 10 variables for likeness. The following results section details both the PRE and POST variables of Table 2 (Appendix F) and Table 3 (Appendix G) by pairing the matching variables together (e.g., Excessive worry and anxiety PRE and POST). The observations for PRE excessive worry or anxiety had an average of 24.90 (*SD* = 133.18, SE_M = 24.31, Min = 0.00, Max = 730.00, Skewness = 5.20, Kurtosis = 25.03).The observations for POST excessive worry or anxiety had an average of 26.46 (*SD* = 137.88, SE_M = 26.06, Min = 0.00, Max = 730.00, Skewness = 5.00, Kurtosis = 23.04). The observations for PRE feeling upset, downhearted or blue had an average of 0.47 (*SD* = 1.01, SE_M = 0.18, Min = 0.00, Max = 3.00, Skewness = 1.84, Kurtosis = 1.69). The observations for POST feeling upset, downhearted or blue had an average of 0.46 (*SD* = 0.96, SE_M = 0.18, Min = 0.00, Max = 3.00, Skewness = 1.76, Kurtosis = 1.51). The observations for PRE frustration irritation or close to losing your temper had an average of 0.63 (*SD* = 1.27, SE_M = 0.23, Min = 0.00, Max = 6.00, Skewness = 2.86, Kurtosis = 8.85). The observations for POST frustration irritation or close to losing your temper had an average of 0.32 (*SD* = 0.72, SE_M = 0.14, Min = 0.00, Max = 3.00, Skewness = 2.44, Kurtosis = 5.51). When the skewness is greater than 2 in absolute value, the variable is considered to be asymmetrical about its mean. When the kurtosis is greater than or equal to 3, then the variable's distribution is markedly different than a normal distribution in its tendency to produce outliers (Westfall & Henning, 2013). The summary statistics can be found in Table 2 (Appendix F) and Table 3 (Appendix G).

Over 40 variables were analyzed, and none were found to be statistically significant. However, the findings illustrated the need for further interventions, as many subjects reported baseline pain, fatigue, and other emotional and physical concerns. Therefore, one could argue that the results were clinically significant and should be evaluated further to improve physical and mental wellbeing.

Impact of project

The principal investigator was pleased to experience the cooperation and support of the local school district and educators. Overall, the participants had a fair amount of generalized complaints and the intervention was affordable and accessible. A program such as this that focuses on enhancing knowledge and holistic health is easy to implement and easily sustainable. It is unknown at this time if the project intervention, or similar methods, will be sustained, but there have been some talks about expanding a program such as this. Due to Covid-19, the school districts will be closed for an undisclosed period of time and are not available for follow up discussions.

Discussion

Summary

Risk reduction of cardiovascular events is a concern locally, nationally, and globally. In order to combat the negative effects of cardiovascular disease, a multidisciplinary team approach is necessary to deliver care in a consistent and culturally competent manner. If we want to reduce risk of cardiovascular disease, we need to decrease the dependence on medicine and focus our interventions toward lifestyle changes. By educating teachers, who are in a unique position to impart behavioral interventions, we may not only be reaching them in a sustainable and non-

threatening way, but we may also affect the wellbeing of their children and parents, as they gain the skills they need to improve their health status more consistently. By holistically treating our communities and providing them with the resources they need to make smart decisions, we reinforce healthy behaviors for generations. Any efforts to reach this population will have lasting effects on the way they raise their young and care for their elderly. Simple efforts, such as promoting fresh foods and providing ideas for exercise regimens, can help families make choices that significantly reduce harm in the long run.

Limitations

Targeting harm reduction is multifaceted and requires interprofessional collaboration and community support. It also necessitates the need for compassionate, engaged health professionals who can serve as innovators in healthcare delivery. Numerous stakeholders in town suggest that, while there are resources, there are either not enough or they are not readily available to the people. Risk reduction for cardiovascular diseases encompasses many aspects of care and is difficult to achieve in disadvantaged communities. Perhaps, if patients had increased access to education, resources and coaching, they may develop improved self-efficacy and self-management tools. If they were competent in how to incorporate a nutritious diet and moderate exercise into their lifestyles, the need would be less for medications, and the clients would understand how diseases like hypertension affect their risk for debilitating conditions such as heart attack or stroke. Simple interventions, such as limiting sodium intake, can significantly improve cardiovascular measures, but have failed to do so (Office of Disease Prevention and Health Promotion, 2019). This suggests that despite efforts, cardiovascular risk reduction is still a problem, and widescale interventions have not always been met with success.

Recommendations

This rural community is in need of comprehensive healthcare. Motivational interviewing and self-management are gaining traction in chronic disease management, because clients need the education and skills necessary to make lasting behavioral changes. These tools guide practitioners through a method of teaching in a manner that is sensitive yet informative. Through risk reduction via lifestyle changes and increasing adherence to the treatment plan, multiple studies have suggested statistically significant changes in numerous metrics. Positive results were seen with community-based interventions in similar populations (Ogedegbe et al., 2008). Treating this rural community of educators with a unique and tailored approach to risk reduction may yield greater impacts in the field of chronic disease management and may improve workplace dynamics and decrease sick days. It is therefore suggested that this topic be further studied.

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Appendix A

Table 1

Evaluation Table

Citation	**Theory/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Major Variables Studied and Their Definitions**	**Measurement/ Instrumentation**	**Data Analysis**	**Findings/ Results**	**Level of evidence/ Decision for Use/Application to Practice**
(Hedegaard et al., 2015). MA in patients with HTN: a RCT. **Country:** Denmark **Funding:** Funded by unrestricted grants from The Hospitals Pharmacies' and Amgros' Research Developmen -t FDN and The Actavis FDN.	NS (Self-Care Theory)	**Design:** RCT **Purpose:** A randomized trial was performed to investigate the effectiveness of a multifaceted PH IN in a HS to improve MA in hypertensive pts. MI was a key element of the IN.	N- 532 n– 516 IG – 231 CG-285 **Demographics:** M age – 62 yrs m/f- 60/40% Edu: NS **Setting:** Odense University Hospital, Denmark. Dec. 2012-July 2013. 3 outpatient clinics. **Inclusion:** Pts with HTN from 1 cardiology and 2 endocrinology OC. 18 yrs. or older, RX for at least 1 AA. **Exclusion:** Pts	IV: adherence. The IG received usual care and a PH IN consisting of 3 elements: 1) a MR focused on identifying drug-related problems for antihypertensive or LC agents followed by advice to the PCP in charge; 2) a pt INTV; 3) 2 or more follow-up TC to the pt within the first 6 mos after inclusion. DV1: LC agents DV2: AA DV3: LC agents IV1: The primary outcome was overall adherence to AA and LC agents 12 months	DRAW, MAQ, SBP, DBP	Median difference estimate was derived from the Hodges-Lehmann estimate, mixed-effect linear regression model, Kaplan-Meier curve, Cox proportional hazard model, CI, FE, unpaired t test, Wilcoxon-Mann Whitney 2-sided test, EpiData version 3.1,	DV1 (MPR) IG – 0.93 (0.82-0.99) CG – 0.91 (0.76-0.98) *p* value - 0.02 DV2 IG – 0.95 CG- 0.94 *p* value - 0.23 DV3 IG- 0.97 CG-0.89 *p* value-0.02 **Cohen's D=** 0.11 (small)	**Level of Evidence:** LOE II **Strengths:** Strong methodology, reliable instruments, faster medical assessment, researcher was blinded when assessing outcomes. **Weaknesses:** educational levels NS, and exclusion of pts outside Denmark region. SS. More pts than expected chose not to participate. Pts had MC, which may have affected their MPR. F/u measurements were missing for 26% of the cohort. PH and PCPs were not blinded to allocation. **Conclusions:** A multifaceted PH IN in a HS led to a sustained improvement in MA for pts with HTN. **Feasibility:** The IN had no

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Bias: Contaminati-on bias (Excluded pts without an AA or those with more than 1 AA, which is often standard of care).			who lived in a CH, TI, MDP, MDHN, Pts residing outside of the Denmark region, or CogI. **Attrition:** 21.05%	after inclusion, reported as a continuous, as well as a binary outcome. DV1: Secondary outcomes were composite MPR at 3, 6, and 9 months, as well as adherence and persistence to D, CA, BB, RA, and LC agents, all at 12		Stata version 13		significant impact on BP and secondary clinical outcomes. Should be studied further before applying to practice.
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(Alhalaiqa et al., 2012). AT for medication NCP with HTN: a RCT **Country**: UK **Funding:** Funded by a doctoral studentship grant from Philadelphia University, Jordan and the University of East Anglia, UK. The funders were not involved in the design or analysis of this study. **Bias**: Selection bias (Enrollment was done	NS (cognitive and motivational interviewing techniques)	**Design:** Parallel-group single-blind RCT **Purpose**: Primary outcome was to establish the efficacy of AT compared with TAU in reducing BP in NCP	N=136 IG: 68 CG: 68 **Demographics:** M age- 53 yrs, f - 54% C – 67% smokers – 31% married- 76 % **Setting:** Patients were recruited from 3 general hospital outpatient clinics in Jordan **Inclusion:** Any HTN pt who visited one of 3 clinics in Jordan from Aug. 2009-Jan. 2010, age 18+, assessed as NCP by reviewers **Exclusion:** mental illness, HTN complications, DM, CHF, RF, other CD, or pregnancy. **Attrition:** 10 (7.3%).	IV1: Adherence (measured by pill counting) AT=7 one-on-one sessions lasting 20 min. over 7 wks. Measured at baseline and 11 wks after randomization. Calculated by dividing the # of pills not taken in a month by the total # of pills RX'd. DV1: SBP (over 140) measured at baseline and 11 wks after randomization DV2: DBP (over 90) measured at baseline and 11 wks after randomization DV3-(G-H) general harm, intrinsically harmful properties of meds DV4- (G-O) general overuse of meds by providers DV5- (G-B) general	SBP, BAMQ, MMAS, mercury syphymomano-meter measured twice on right upper arm of a seated patient who had been resting for over 10 minutes (average of 2 measurements was used)	SD, alpha 0.05, 80% power, 2-tailed test of significance, 5-point Likert-type scale, Rubin's equations, analysis of covariance, logistic regression	IV1- 37% DV1- 23.4 (95% CI: 20.7, 26.2) IG – 97% CG – 71% *p* value - 0.01 DV2 – 15.6 (95% CI: 13.2, 17.9) *p* value -0.01 DV3- (G-H:0.75, p<0.001) DV4- (G-O: -0.31, p<0.001) DV5- (G-S: -0.46, p<0.001) **Cohen's D=** 0.22 (small)	**Level of Evidence**: LOE II **Strengths:** Analysts were blinded, computer generated randomized allocation to groups. Power analysis for sample size and economic analysis were performed; low attrition rate. BAMQ has established validity. **Weaknesses:** Assessment of potential applicants was stopped when sufficient numbers had been recruited to the study, TAU was not clearly defined. Short follow-up period (1 month). Pts knew they were being monitored. AT was delivered by only one person. Unknown if generalizable. **Conclusions:** AT improves MA for HTN **Feasibility:** Suggests AT for HTN is clinically important for use in practice and is likely to be cost-effective.

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(Ogedegbe et al., 2008). A practice-based trial of MI and adherence in hypertensive African Americans. **Funding:** grants from the National Heart, Lung, and Blood Institute and the National Institutes of Health Bethesda, MD, **Country: USA** **Bias:** contamina-tion	Self-care model- NS	This RCT tested the effect of a practice-based MI counseling vs. UC on MA and bp in 190 hypertensive African Americans.	N=190 n-UC group 95 n-intervention group 95 **M age:** 54 years **Demographics:** 88% women, 17% married, 77% high school or college education, over 50% unemployed, recruited from 2 community-based primary care practices in New York City (NY Presbyterian Hospital Ambulatory Care Network). **Inclusion:** age gtet 18, black or African American, able to provide written informed consent, diagnosed with htn (bp gtet 140/90 or 130/80 for those with DM or RD) **Attrition:** 13 (6.84%)	The primary outcome was adherence, measured by electronic pill monitors, secondary outcome was within-patient change in office bp from baseline to 12 mos. **MI**-directive, patient-centered counseling designed to motivate pts for change by helping them recognize and resolve the discrepancy between their behavior, personal goals, and values. **MI group**-received UC plus behavioral counseling about MA using MI techniques. 30-40 min. of MI was received at 3, 6, 9, & 12 mos. **IV:** UC group medication adherence **DV1:** MA in intervention group after 12 mos. **DV2:** sbp drop 12 mos. after intervention **DV3:** dbp drop 12	Charlson Comorbidity Index, MEMS, clinic bp readings, mercury sphygmomanometers,	Randomization, mixed-effects regression models, Little's MCAR	**IV:** UC postintervention adherence: 43% (p=0.027) **DV1:** MI postintervention adherence: 57% (p=0.027) **DV2:** UC BP drop (*t* with 145.1, df=-2.26, *P*=0.026) vs MI group: (*t* with 150.5, df=-1.86, *P*=0.065). **DV3:** UC BP drop (*t* with 151.2, df=-2.61, *P*=0.01) vs MI group bp drop (*t* with 156.7, df= -0.73, *P*=0.003). **Cohen's D=**	**LOE:** 2 **Strengths:** long duration of study (12 mos.), focused on low income, low education, and minority population (relevance to PICOT), practice-based intervention, although not statistically significant, was still clinically significant because it lowered bp measurements, low risk of adverse events to pts. **Weaknesses:** no blinding whatsoever, randomization was done after baseline assessment by the study statistician, missing data, limited generalizability, no account for intensity of bp treatment (med interventions)

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			Exclusion: ns	mos. after intervention			0.07=small	

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(Friedberg et al., 2015). Effectiveness of a tailored behavioral intervention to improve hypertension control: Primary outcomes of a randomized controlled trial. **Funded** by the Dept. of Veterans Affairs Health Services Research and Development Service Research Career Developmen	Transtheoretical model- as stated	3-arm parallel RCT to evaluate whether a telephone-delivered, behavioral stage-matched intervention would lead to better bp control than UC in pts with uncontrolled bp.	**N=**533 n=SMI group 176 n= UC group 177 n=HEI group 180 **Inclusion:** had HTN, on AA for 6 mos, HTN was uncontrolled, able to provide informed consent Exclusion: CVD, HF stage 3 or 4, severe PI, AIDS, Tuberculosis, lupus, end-stage renal failure, less than 1-year life expectancy, lack of telephone, inability to follow study protocol, major surgery in last 3 mos., those not available for f/u, unable to provide consent, those temporarily in the area	**IV: Uncontrolled HTN-** sbp gtet 130 or diastolic bp gtet 80 in DM or CKD, or sbp gtet 140 or dbp gtet 90 in all others at the time of study. **DV1: SMI-** behavioral stage-matched intervention **DV2: HEI-** nontailored health education intervention **DV3: UC group-** received standard information about htn but no counseling **DV4: MA-** self-report of taking bp meds as prescribed for gtet 6 days/week.	Omron HEM 907XL automated bp machine was used on the patients right upper arm 6x, cuff was placed 1" above the crook of the elbow. Height and weight were also measured, and arm circumference was measured if there was any question to the size of the cuff.	Computer generated random assignments to groups, telephone counseling for 6 mos., computer-based intervention model for SMI group, MMAS, WFFQ, dietary approaches to stop htn score, Pearson X^2, Rao-Scott X^2, Bonferroni adjustment, logistic regression, SAS version 9.2, 2-sided *P* values	**IV1: Bp control at 6 mos.**: DV1: SMI: 64.6 ($p<0.001$), DV2: HEI: 54.3 (0.108), DV3: UC: 45.8 ($p<0.05$). **SBP at 6 mos: (95% CI)** DV1:SMI: 131.2 (129.1, 133.3) SMI vs UC p = 0.009 DV2:HEI: 131.8 (129.9, 133.7) HEI vs UC p=0.047 DV3:UC: 134.7 (132.7-136.7) **IV:Change in proportion**	**LOE:** 2 **Weaknesses:** used additional information other than AHA educational materials for HEI group, so information is not easily generalizable and reproducible, unable to judge quality of material as it is not standardized information. The study was not powered to test between the 2 active intervention arms. Many participants withdrew between enrollment period and first study visit, and also post-baseline (n=172). **Strengths:** relevance to the PICOT question, ease of use, randomization, baseline bp was similar among groups, mean of 6 bp measurements, low risk of adverse events to pts., reduced costs and increased scalability due to no in-person contact, ease of feasibility

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t Award. No disclosures reported. **U.S.**							**of bp under control from baseline to 6 mos, %:** DV1:SMI: 19.7 (SMI vs UC p=0.0004) DV2: HEI: 11.8 (HEI vs UC p=0.051), DV3: UC: 1.9 **Change in sbp from baseline to 6 mos.** DV1: SMI: -4.7 (-6.9, -2.5) (SMI vs UC p=0.007) DV2: HEI: -5.4 (-8.5,-2.3) (HEI vs UC p=0.009) DV3: UC: -2.7 (-5,-4). **DV4: Medications (proportion % in action or maintenance at 6 mos.)**	

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							SMI: 95 (SMI vs UC p=0.581) HEI: 98 (HEI vs. UC p=0.502) UC: 96 **Cohen's D=**1.08 (large)	
Citation	**Theory/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Major Variables Studied and Their Definitions**	**Measurement/ Instrumentation**	**Data Analysis**	**Findings/ Results**	**Level of evidence/ Decision for Use/Application to Practice**
(Carter et al., 2015). Cluster-randomized trial of a physician/ pharmacist collaborative model to improve blood pressure control. **Funding:** National Heart, Lung, and Blood	Collaborative model/team-based care-ns	To evaluate if a physician/ pharmacist collaborative model would be implemented as determined by improved bp control in pcmo with diverse geographic and patient characteristic and whether long-term bp control could be sustained.	**N=**625 **n=**224 UC group **n=**207 sustained care group n=194 brief intervention group (9 mos.) Subjects were recruited from 32 medical offices in 15 states. **Demographics:** over 50% were minorities, 49% mades less than $25,000 yearly, 50% had DM or	**BP goal:** less than 140/90 for uncomp-licated pts and 130/80 for those with RD or DM. **SC**-RN, LPN, or M.A. recruited subjects and collected study data.	BP measurements at baseline, 6, 9, 12, 18, & 24 mos. Validated survey instrument for scoring clinical pharmacy services. JNC-7 Guidelines. Omron HEM 907-XL bp measurement device with standardized measurement techniques. Validated 4-item instrument used	Randomizati on, nonlinear mixed-effects model, OR, intraclass correlation coefficient estimate, Lan-Demets$_\alpha$ spending function, O'Brien-Fleming stopping boundaries, conditional	**IV1: control group at 9 mos.** BP control =34% vs. **DV1: IN group at 9 mos.** BP control =43% (adjusted OR, 1.57 [95% CI, 0.99-2.50]; *P*=0.059). **DV2: BP control at 9 mos. for minority**	**LOE:** 2 **Strengths:** Cluster, randomized trial design, intent-to-treat analysis, controlled for covariances, standardized measurements, high utility to PICOT question and population, length of study, **Weaknesses:** no blinding, funding constraints lead to premature termination of some subjects, imbalances occurred in the study arms due to the cluster nature of the design, low power due to subjects dropping out of being lost to f/u, at baseline, the brief intervention group were more likely to be married and have private insurance. No way to

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Institute **Bias:** no blinding **Country:** U.S.		Prospective, multicenter trial.	CKD. **Inclusion:** pcmo with an onsite clinical pharmacist, subjects had to provide IC. **Exclusion:** excessively high bp, CogI, recent heart attack, sleep apnea, angina, stroke, HF, RD, elevated liver tests, not a pt in the study office, declined mental status exam or withdrew consent **Attrition:** 133 (21.3%) **IV:** control group that received UC **DV1:** 9-mo. PH IN (BI) **DV2:** 24-mo. PH IN (SI)		to measure MA.	power, linear mixed model with random effects	**subjects** 37% vs non-minority subjects 28% (adjusted OR, 1.54 [95% CI, 0.83-2.86]; *P*=0.17). **DV3: bp at 24 mos.:** IN group: 63% vs. CG: 46% (adjusted OR, 1.84 [95% CI, 0.89-3.78]; *P*=0.098). **Cohen's D=** 0.37= moderate	control for medications changing, as control group was prescribed much more pharmacotherapy, which may have made the results insignificant, many adverse events reported, but not significant by arm/group.

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(Schoenthaler et al., 2015). A practice-based RCT to improve MA among Latinos with htn: study protocol for a RCT. **Funding:** **Country:** U.S.	Common sense model of self-regulation (CSM) and Vrijens medications adherence taxonomy	RCT with2 arms	**N**=148 **n**=74 IG **n**=74 UC group sample was recruited from a cbmc. in New York. **Inclusion:** self-identify as Latino, gtet 18 years of age, has HTN & at least 1 CVD risk factor, takes an AA **Exclusion:** refuse or are unable to provide IC, already in another study, has PI **Attrition:** 10% at 1 mo., 8% at 6 mo. visit	To evaluate the effectiveness of a culturally tailored, evidence-based AI delivered by bilingual health coaches vs. UC on MA at 6 mos. among 148 Latino pts with HTN who are uncontrolled and nonadherent to meds. Secondary aim was to evaluate the effect of AI vs. UC on bp reduction at 6 mos. UC care-standard htn treatment as determined by pcp AI group-received 6 biweekly sessions with bilingual health coaches for 9 sessions HTN-bp>140/90 on at least 2 consecutive visits within the year or >130/80 for DM or RD pts. & at least 1 CVD risk factor	Morisky adherence scale, electronic monitoring device, validated automated BP device to assess BP, AI script, semi-structured interviews, EMR- embedded adherence intervention template, BAMQ, Comprehensive Assessment and referral evaluation dementia diagnostic scale, Illness perceptions questionnaire-revised, MA SE scale, Watchman automated device, Charleston comorbidity index, Test of	α=0.05 level for a 2-sided test, chi-square test of independence, ANOVA, logit model, logistic regression, 2-sided tests of significance, OR, linear mixed effects regression models,	**MA at 6 mos. visit:** **Within-pt change in sbp:** **Within-pt change in dbp:** **No data reported, trial began in October 2012. N=112 in 2015 and patient recruitment was still ongoing.**	**LOE:** 2 **Strengths:** block randomization, utility to PICOT question, EMR for ease of use incorporates intervention into clinic workflow, all analyses were done in an intent-to-treat design **Weaknesses**: no blinding to group assignments, patients were financially compensated, which may not yield the same results in practice without compensation, high rate of patient refusal to participate, high rate of providers leaving the study site

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					functional health literacy in adults, treatment self-regulation questionnaire, primary care assessment survey			
Citation	**Theory/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Major Variables Studied and Their Definitions**	**Measurement/ Instrumentation**	**Data Analysis**	**Findings/ Results**	**Level of evidence/ Decision for Use/Application to Practice**
Citation: (Boutin-Foster et al., 2016). **Title:** Results from the trial using motivational interviewing , positive affect, and self-affirmation in AfAm's with HTN (TRIUMPH) **Funding:** Center for Excellence in Health	Social cognitive theory, positive affect theory	The objective of the study was to improve BP control by targeting SE, a major determinant of MA. **Two-arm RCT**	**N**=238 **n**=122 CG **n**= 116 IG Adult pts who received care at FQHC's and community ambulatory practices in South Bronx and Harlem, NYC. **Demographics:** M age: 56, 70% female, 70% had high school education **Inclusion:** self-identified as AfAm, HTN	**SE-**describes the confidence in one's ability to take action to overcome barriers and is a major cornerstone of health behavior change. **MI-**based on the work done by Miller and Rollnick. Delivered during bimonthly telephone calls for 12 mos. **positive affect induction-** based on positive affect theory, which states that positive affect enables individuals to be more open-minded,	EMR, Charlson Comorbidity Index, psychosocial measures, htn hx, center for epidemiologic studies depression scale, MA SE scale, perceived stress scale, positive and negative affect scale, medical outcomes study-social support survey, HTN workbook, behavior contract, BPTru	Randomized in a 1:1 ratio to CG or IG, sample size calculations included a power of 80% and standard test level of .05. chi-square and student's t-test, univariate logistic regression, multivariate model, SPSS **Cohen's D=**	**BP control at 12 mos.:** CG: 82.2% IG: 83.7% (OR=1.33, CI=.57-3.10, P=.50).	**LOE:** II **Strengths:** intent-to-treat model, utility to PICOT, ease of feasibility, can be generalized to any intervention **Weaknesses:** Neither the participants nor the research assistants were blinded to the study intervention. High attrition rate. No cluster randomization, which may result in contamination. The same research assistants were used for the CG and IG. Both groups received telephone calls at the same time, effects were insignificant.

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Disparities Research and Community Engagement **Bias:** contamination **Country:** U.S.			diagnosis, on at least one AA, had elevated BP at time of recruitment, could provide consent. **Exclusion:** ns **Attrition:** 61 (25.6%)	motivated, and responsive to health messages, thus fostering their ability to achieve their personal goals. **self-affirmation manipulation-** describes the importance of focusing on personal strength and core values as a method of counteracting negative responses to stress and maintaining psychological well-being. **HTN-** bp>140/90 on average or >130/80 for DM or RD pts. & at least 1 CVD risk factor **IV:** BP **DV:** MI and support		0.11=small		
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(Barker-Collo et al., 2015). **Title:** Improving Adherence to Secondary Stroke Prevention Strategies Through MI: RCT. **Bias:** None **Funding:** New Zealand Health Research Council **Country:** New Zealand	Cognitive behavioral psychotherapy - ns	Single-blind, prospective phase III **RCT** **Purpose:** tested effectiveness of MI for reducing stroke recurrence, measured by improving adherence to recommended meds and lifestyle changes compared with usual care.	**N=386** **n= 193 IG** **n= 193 CG** **Inclusion:** stroke within 28 days, able to provide consent, gtet age 16 **Exclusion:** subarachnoid hemorrhage, recurrent stroke, not in region, CogI, communication difficulties, too unwell, discharge to rest home/care, passed randomisation timeframe, PI, in another study, not available for f/u, not contactable, other **Attrition:** 39 (10.10%)	**MI treatment**- 4 sessions at 28 days, 3, 6, & 9 mos. post stroke via telephone or face-to face interviews **IV:** change in SBP and LDL cholesterol at 12 mos. **DV:** self-reported adherence, new stroke, or coronary heart disease events, quality of life, and mood **MA**-determined by asking the pt if they had taken all of their meds as prescribed in the last 7 days and if not then specifying the details	Hospital Anxiety and Depression Scale, Short Form-36, online randomisation service, minimization randomization, Barthel Index	SAS, all tests were 2-sided with a 5% level of significance, unadjusted relative risks, generalized linear regression models, random effects mixed models, model adjusted mean differences, odds ratios, 95% CI, sensitivity analysis **Cohen's D=0.36=** moderate	**BP M difference in change**, -0.2.35 [95% confidence interval, -6.16 to 1.47] **cholesterol** (mean difference in change, -0.0.12 [95% confidence interval, -0.30 to 0.06]) **effects on self-reported MA at 6 months** (1.979; 95% confidence interval, 0.98-3.98; P=0.0557) **and 9 months** (4.295; 95% confidence interval, 1.56-11.84; P=0.0049) post stroke.	**LOE:** II **Strengths:** treatment allocation was concealed from staff, researchers who provided the intervention were not involved in data analysis, intent-to-treat principle **Weaknesses:** utility to PICOT question, generalizability, use of last-value-carried forward for missing data, couldn't blind participants

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(Stewart et al., 2014). **Title:** A multifaceted pharmacist intervention to improve antihypertensive adherence: a cluster-randomized, controlled trial (HAPPy trial) **Bias:** recall bias **Funding:** ns **Country:** Australia	Ns- self-care model	To evaluate a community PH IV to improve adherence with AA with a view to improving BP control. A prospective, non-blinded, cluster-**randomized, controlled trial**	**N=**395 **n=**207 IG **n=** 188 CG **Demographics:** M age: 66.7 yrs., 51.1% males **Inclusion:** Adults with primary HTN who obtained AA's within the previous 6 mos. those with poor refill adherence were preferentially identified, gtet 18 years of age, available for f/u at 6 mos. from baseline **Exclusion:** participation in other adherence	**Primary outcome:** change in proportion self-reporting MA. **Secondary outcome:** BP change BP- if bp differed by more than 10mmHG for SBP or 5 mmHg for DBP, a third reading was taken and the average of the 2 closest readings was recorded.	PhARIA, MedeMineCVD, FRED Dispense, intracluster correlation coefficients, cluster randomization. OMRON HEM-790IT, Morisky scale, Tool for Adherence Behaviour Screening	SAS version 9.2, chi-square tests for equal proportion reported as numbers (percentages). Continuous normally distributed variables were compared using Student t -tests and reported as means (standard deviations) whereas non-normally distributed	**proportion of adherent participants** increased in both groups but was not significantly different between groups [57.2% to 63.6% (control) vs. 60.0% to 73.5% (intervention), P = 0.23]. **The mean reduction in systolic BP** was significantly greater in the intervention group (10.0 mmHg vs.	**LOE:** II **Strengths:** intent-to-treat principle, ease of pt recruitment, multidisciplinary approach, sample size and low rate of attrition **Weaknesses:** ease of use, Hawthorne effect, recall bias, poor participant recall, possible low sensitivity to change, possible intensified prescribing, possibility of PH's falsifying BP results, uncertain of adherence due to short time span

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			promotion programs, had a PH-conducted med review in the last 12 mos., non-English speaking, not self-administering AA's. **Attrition:** 41 (10.4%)			variables were compared using Wilcoxon rank sum tests and reported as medians (interquartile range). To control for the effects of cluster randomization, group changes were compared using mixed linear and nonlinear modelling for normally and non-normally distributed data, with individual pharmacies treated as a random effect. 18 Differences from cluster-	4.6 mmHg; P = 0.05). The **proportion of patients who were non-adherent at baseline and adherent at 6 months was** 22.6% (95%CI 5.1-40.0%) higher in the intervention group (61.8% vs. 39.2%, P = 0.007). Among participants with baseline BP above target, **reduction of systolic BP** was significantly greater in the intervention group [by 7.2 mmHg (95%CI 1.6-12.8 mmHg); (P = 0.01)].	

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						adjusted models have been reported with 95% CI. A two-sided P-value ≤ 0.05 was statistically significant	Among participants non-adherent at baseline and above target BP, the **proportion reporting adherence at 6 months** was significantly greater in the intervention group [56.8% vs. 35.9%, P = 0.039). **Cohen's D: 0.89=** large	
Citation	**Theory/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Major Variables Studied and Their Definitions**	**Measurement/ Instrumentation**	**Data Analysis**	**Findings/ Results**	**Level of evidence/ Decision for Use/Application to Practice**
(Solomon et al., 2012). Medication routines and adherence among hypertensive African Americans. **Country**:	NS (Self-Care Theory)	**Design:** Practice-based RCT **Purpose**: To 1) identify pt sociodemographic factors that are associated	N – 190 IG – 64 CG – 64 **Demographics:** f- 88%, m – 12% M age – 54 yrs Medicaid-74% High school Edu-23% Unemployed-54%	BP (<140/90) MI-4 sessions of behavioral counseling regarding MA at 3 mos. Intervals MA-the proportion of days in which pts took their AA as rx'd IV1 – MA with med-taking consistency DV1 – DBP with	MEMS, Powerview	SPSS, SAS, SD, logistic and linear regression, 2-sample t test,1-way analysis of variance, X^2 & ANCOVA	At 9 mos. IV1- (F=9.54, p=.002) DV1- (OR, 1.319; 95% CI, 0.410–4.246; P= .642) DV2- (OR,	**Level of Evidence**: LOE II **Strengths:** Strong methodology, power analysis done & reliable instruments **Weaknesses:** May not be generalizable, electronic monitoring was used, and cannot confirm that doses were actually taken **Conclusions:** Aiding pts with HTN

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U.S. **Funding:** funded by grants from the National Heart, Lung, and Blood Institute and National Institutes of Health National Center for Advancing Translation-al Sciences New York University Clinical and Translation-al Science Awards **Bias:** None		with having a consistent med-taking routine; (2) examine the association between med-taking consistency and MA over a 9-month monitoring period; and (3) examine the association between med-taking consistency and BP control.	Single-44% **Setting:** 3^0 referral metropolitan hospital in Australia. **Inclusion:** hypertensive African Americans receiving care from two primary-care facilities affiliated with New York Presbyterian Hospital's Ambulatory Care Network (ACN). **Exclusion:** None, 190 were eligible and data exists for 190 pts **Attrition:** n/a	consistency index DV2 – SBP with consistency index			0.621; 95% CI, 0.195-1.974; p=.419) **Cohen's D= 0.14** (small)	in establishing a consistent med-taking routine is more likely to increase adherence to meds and improve BP control. **Feasibility:** Recommended for use in practice due to increase in adherence of TCP by interventions including continued nursing support via telephone.

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Appendix B

Table 2

Synthesis Table

Author	(Solomon et al.).	Stewart et al.).	(Barker-Collo et al.).	(Boutin-Foster et al.).	(Carter et al.).	(Schoentha-ler et al.).	(Ogedeg-be et al.).	(Alhalai-qa et al.).	(Friedbe-rg et al.).	(Hedegaa-rd et al.).
Year	2012	2014	2015	2016	2015	2015	2008	2012	2015	2015
LOE	II	II	II	II	II	II	II	II	II	II
Country	U.S.	Austra-lia	New Zealand	U.S.	U.S.	U.S.	U.S.	U.K.	U.S.	Denmark
Study Characteristics										
Bias	none	recall	none	C. B.	No bl.	none	C.B.	selection	none	C.B.
Age (mean yrs.)	54	66.7	ns	56	61.8	ns	54	53	66.4	62
Ethnicity	Af. Am.	mixed	mixed	Af. Am.	mixed	Latino	Af. Am.	ns	mixed	ns
Gender	f- 88%	m-51.1%	ns	f-77%	f-61.3%	ns	f-88%	f-54%	m-98.9%	m-60%
Setting		pharm								Hospital
Office/pr. care	X		x	x	x	x	x	x	x	
N	190	395	386	238	625	148	190	136	533	532
Measurement tools	MEMS, Power-view	PhARIA, Mede-Mine-CVD,	HADS, Short Form-36, online	EMR, CCI, psycho-social measures, htn hx,	BP measure ments, survey	MS, EMD, BP device script, interviews, EMR, MA SE	Charlson Comorbidity Index, MEMS, clinic bp	SBP, BAMQ, MMAS, mercury syphymo	Omron HEM 907XL	DRAW, MAQ, SBP, DBP

Af. Am.- African American, **BAMQ**- beliefs about medications questionnaire, **beh. change**-behavior change, **bl**.-blinding, **CBMC**-community based medical center, **CCI**-charlson comorbidity index, **CESDS**-center for epidemiologic studies depression scale, **ch**- change, **contam.**-contamination bias **DBP**-diastolic blood pressure, **DRAW**- drug adherence work-up tool, **EMD**-electronic monitoring device, **f**-female, **IN**-intervention, **Med. adh**-medication adherence, **MI**-motivational interviewing, **C.B.** – contamination bias, **CBT**-cognitive behavioral therapy, **gen. pop.**- generalizable population, **hads**-hospital anxiety and depression scale, **impr. MA**- improved medication adherence, **life mod.** - lifestyle modification, **LOE**- level of evidence, **N**-sample size, **ns**- not stated, **perc. incr. QOL**- patient's perceived increase in quality of life, **pharm**-pharmacy, **pr. care**-primary care, **m**-male, **MAQ**-medication adherence questionnaire, **MEMS**- Medication event monitoring system, **MMAS**-Morisky medication adherence scale **mos.**- months, **MS**- Morisky scale, **rx**-prescription, **SBP**-systolic blood pressure, **TABS**- tool for adherence behavior screening, **U.K**.-United Kingdom

		FRED Dispense, OMRON HEM-790IT, MS, TABS	random-isation service, Barthel Index	CESDS, MA SE scale, behavior contract, BPTru	instrument for scoring clinical pharmacy services, 4-item instrument used to measure MA.	scale, multiple surveys	readings, mercury sphygmomanometers	mano-meter		
Duration of IN	9 mos.	6 mos.	12 mos.		9 mos.	6 mos.	12 mos.	11 weeks	6 mos.	12 mos.
Gen. pop		x	x		x					
Intervention										
MI	x		x	x			x			x
CBT							x		x	
Telephone calls			x	x	x				x	x
In-office visits	x		x		x			x		
Change/add rx	x						x			
Med. adh	x					x		x	x	x
MEMS	x						x	x		x
Outcomes										
Beh. change			x				x		x	

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SBP	x	x			x		x	x	x	x
DBP					x		x	x		
Perc. Incr. QOL				x						
Impr. MA	x	x	x					x	x	x
Reduce stroke			x							
Reduce lipids			x							x

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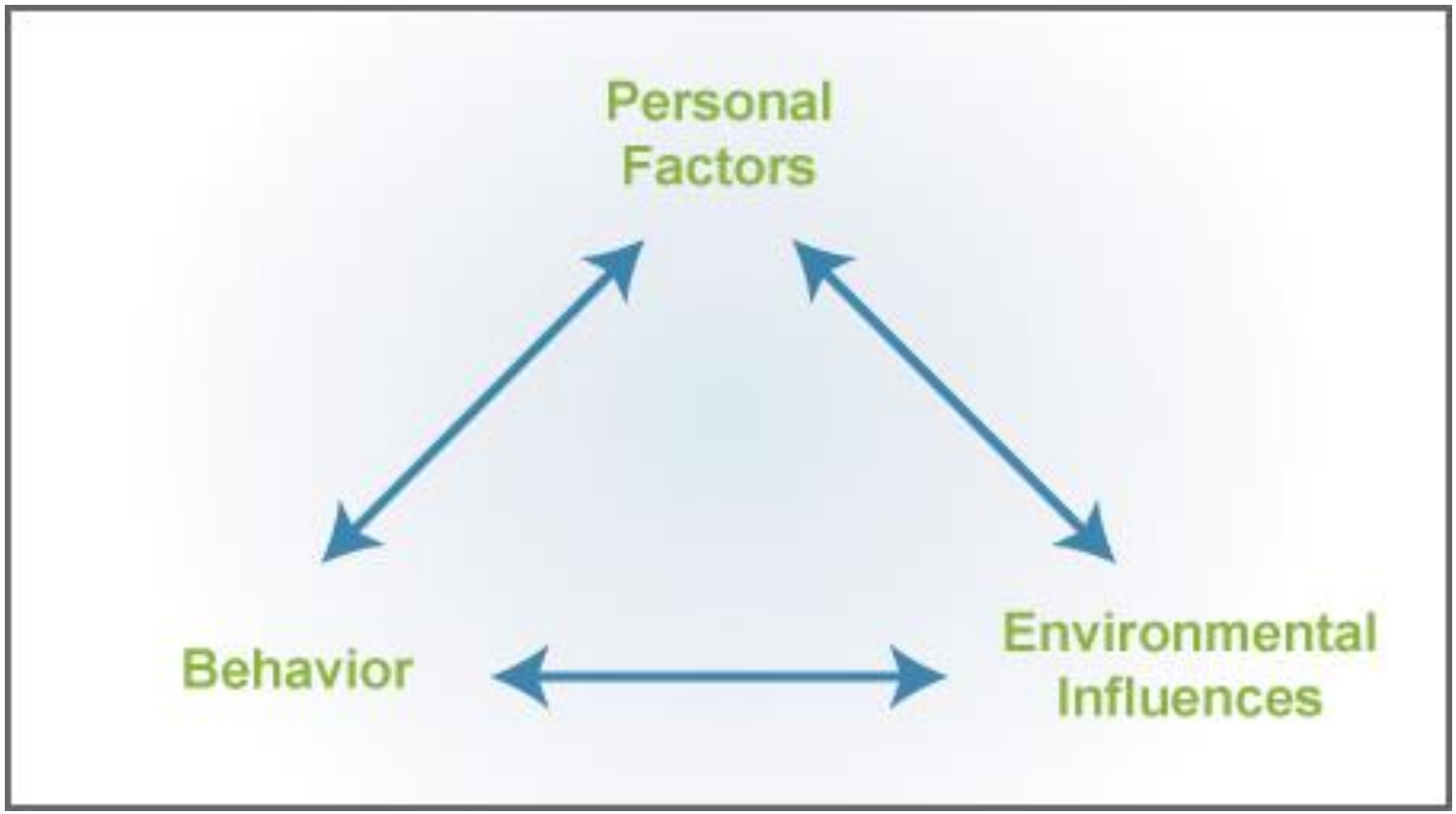
Appendix C

Figure 1

Bandura's Social Cognitive Theory



Appendix D

Budget Plan

Direct Costs:

1. Survey monkey $384/year ($32/mo.) (planning to survey participants online for anonymity)

Indirect Costs:

1. Project leader's time ($33 (RN base pay) x 420 hours (number from DNP 712 credit requirements)) =$13,860.00

Total Cost:

1. $14,244.00 (though site will be saving time, money, and energy by addressing staff health without having to pay for RN contributions)

Appendix E

Figure 2

JBI Model

Appendix F

Table 2

Summary Statistics Table for Interval and Ratio Variables

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
PRE excessive worry or anxiety	24.90	133.18	30	24.31	0.00	730.00	5.20	25.03
PRE feeling_upset_downhearted_or_blue	0.47	1.01	30	0.18	0.00	3.00	1.84	1.69
PRE frustration irritation or close to losing your temper	0.63	1.27	30	0.23	0.00	6.00	2.86	8.85
PRE general_fatigue_tiredness_or_weakness	0.37	0.49	30	0.09	0.00	1.00	0.55	-1.69
PRE I am confident that I could deal efficiently with unexpected events	3.33	0.61	30	0.11	2.00	4.00	-0.28	-0.66
PRE I can solve most problems if I invest the necessary effort	3.30	0.60	30	0.11	2.00	4.00	-0.18	-0.60
PRE No matter what comes my way I’m usually able to handle it	3.33	0.48	30	0.09	3.00	4.00	0.71	-1.50
PRE trouble falling asleep or staying asleep	1.28	1.36	29	0.25	0.00	3.00	0.27	-1.73
PRE under or overweight	0.70	0.47	30	0.09	0.00	1.00	-0.87	-1.24
PRE When I am confronted with a problem I can usually find several solutions	3.30	0.65	30	0.12	2.00	4.00	-0.37	-0.71

Note. '-' denotes the sample size is too small to calculate statistic.

Appendix G

Table 3

Summary Statistics Table for Interval and Ratio Variables

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
POST feeling upset downhearted or blue	0.46	0.96	28	0.18	0.00	3.00	1.76	1.51
POST frustration irritation or close to losing your temper	0.32	0.72	28	0.14	0.00	3.00	2.44	5.51
POST general fatigue tiredness or weakness	0.29	0.46	28	0.09	0.00	1.00	0.95	-1.10
POST I am confident that I could deal efficiently with unexpected events	3.25	0.52	28	0.10	2.00	4.00	0.30	-0.31
POST I can solve most problems if I invest the necessary effort	3.39	0.50	28	0.09	3.00	4.00	0.44	-1.81
POST No matter what comes my way I’m usually able to handle it	3.29	0.53	28	0.10	2.00	4.00	0.18	-0.56
POST trouble falling asleep or staying asleep	27.18	137.75	28	26.03	0.00	730.00	5.00	23.03
POST under or overweight	0.68	0.48	28	0.09	0.00	1.00	-0.76	-1.42
POST When I am confronted with a problem I can usually find several solutions	3.36	0.56	28	0.11	2.00	4.00	-0.07	-0.82
POST excessive worry or anxiety	26.46	137.88	28	26.06	0.00	730.00	5.00	23.04

Note. '-' denotes the sample size is too small to calculate statistic.