12-1-2021

# A Video-Based Educational Program in Improving Knowledge and Adherence to Medication Among Hypertensive Patients Aged Eighteen Years and Older in a Primary Care Office: A Quality Improvement Project.

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A Scholarly Project Presented to the Faculty of the

Nicole Wertheim College of Nursing and Health Sciences

Florida International University

In partial fulfillment of the requirements

For the Degree of Doctor of Nursing Practice

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Approval Acknowledged:

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## Abstract

**Objective:** The purpose of this quality improvement project is to improve hypertensive patients' knowledge of hypertension and medication adherence. Patient's knowledge of hypertension is improved through their understanding of hypertension nature, hypertension complications, hypertension classifications, blood pressure readings and medication side effects. With an improvement in knowledge and medication adherence, hypertensive patients can have a better control of their blood pressure and a decrease of complications caused by hypertension.

**Methods:** This is a quality improvement project using a pre-survey and post-survey design. The target population is patients eighteen years and older with a diagnosis of hypertension that have been receiving medication treatment for more than three months in a primary care office. Twenty participants will be recruited with the assistance of their primary care provider. After consenting, participants will be asked to complete an online pre-survey. Then, the participants will be asked to watch a five-minute video. The content of the video contains what hypertension is, hypertension complications, hypertension classifications, blood pressure readings, and medication side effects. Two weeks later, the participants will be asked to complete an online post-survey. Hill-Bone Medication Adherence Scale (HB-MAS) was the measurement tool used in this project.

**Results:** In the recruited population, 65% were female, 35% were male. The recruited sample was 30% aged sixty-five years and older, 70% aged between 25-year-old to 65-year-old. 65% of the sample were identified as Asian, 10% were Black or African American, 10% Hispanic, and 15% were others. Participants' education levels were: 30% had graduated high school or equivalent, 25% had some college, 20% had graduated 12th degree or less, 15% had bachelor's degree, and 10% had master's degree. Participants showed improvement in hypertension

knowledge on aspects of the lifelong nature of hypertension, the complication of hypertension, blood pressure readings, hypertension classifications, and hypertensive medication side effects. The minimum Hill-Bone Medication Adherence scale score in pre-survey was 17. The minimum score in the post-survey was 24. The pre-survey data showed the highest score of 36 in 30% of the participants. The post-survey showed an increase of 15% (45%). Pre-survey had a mean score of 32.25, and post-survey had a mean score of 33.10. The standard deviation of the pre-survey was 4.84, and the standard deviation of the post-survey was 3.91. There was a variance score of 23.39 for pre-survey and a variance score of 15.29 for post-survey. The post-survey showed a 40% increase in medication adherence, a 30% decrease in medication adherence, and a 30% no change in medication adherence compared to the pre-survey.

**Conclusion:** The study supports that a video-based educational program on hypertension can improve patients' hypertension knowledge. The study shows that participants are lack of knowledge on understanding high blood pressure classifications and medication side effects. The most common reason for medication nonadherence is that patients forget to take their medications. The study reveals that a video-based education can improve patients' medication adherence using the Hill-Bone Medication Adherence Scale in a mean score, standard deviation, and variance score in the post-survey. The study shows an improved hypertension knowledge is not linked to consistency in increasing medication adherence among hypertensive patients.

***Keywords:*** Hypertension, medication adherence, educational intervention, adults

## Introduction

Worldwide, 1.13 billion people are affected by hypertension (World Health Organization, 2019). In the United States, 116 million people aged eighteen years and older have hypertension, accounting for 47.3% of the population. The cost of high blood pressure is 48.6 billion dollars each year (Centers for Disease Control and Prevention, 2021). Hypertension, the "silent killer", increases the risk of heart, brain, and kidney diseases (World Health Organization, 2019). Heart disease, kidney disease, and stroke were the leading causes of death in the United States in 2017 (Kochanek, Murphy, Xu & Arias, 2019). Hypertensive patients who are non-adherent to their hypertensive medication are at greater risk of stroke (Lee, Jang & Park, 2017).

Treatments for hypertension include lifestyle modifications only or lifestyle modifications plus medications (Centers for Disease Control and Prevention, 2021). There is a 100% rate of uncontrolled blood pressure among hypertensive patients who are treated with lifestyle modifications (Centers for Disease Control and Prevention, 2021). Hypertensive patients who are treated with medications and lifestyle modifications have an uncontrolled blood pressure rate of 73.9% (Centers for Disease Control and Prevention, 2021). Thirty-one percent of Americans who are diagnosed with hypertension are non-adherent to their hypertensive medication (Chang et al., 2020). Whether patients have enough knowledge about hypertension and its treatment is a prerequisite to their adherence to the physician's recommended treatment (Ashoorkhani, Majdzadeh, Gholami, Eftekhar & Bozorgi, 2018, p. 317). One of the significant factors for treatment nonadherence was that patient was lack of sufficient knowledge of hypertension including its nature, complications and treatments (Ashoorkhani, Majdzadeh, Gholami, Eftekhar & Bozorgi, 2018, p. 317). The study showed patients had a lack of knowledge of what hypertension is, causes of hypertension, and pharmacological and nonpharmacological

treatments to hypertension (Ashoorkhani, Majdzadeh, Gholami, Eftekhar & Bozorgi, 2018, p. 317).

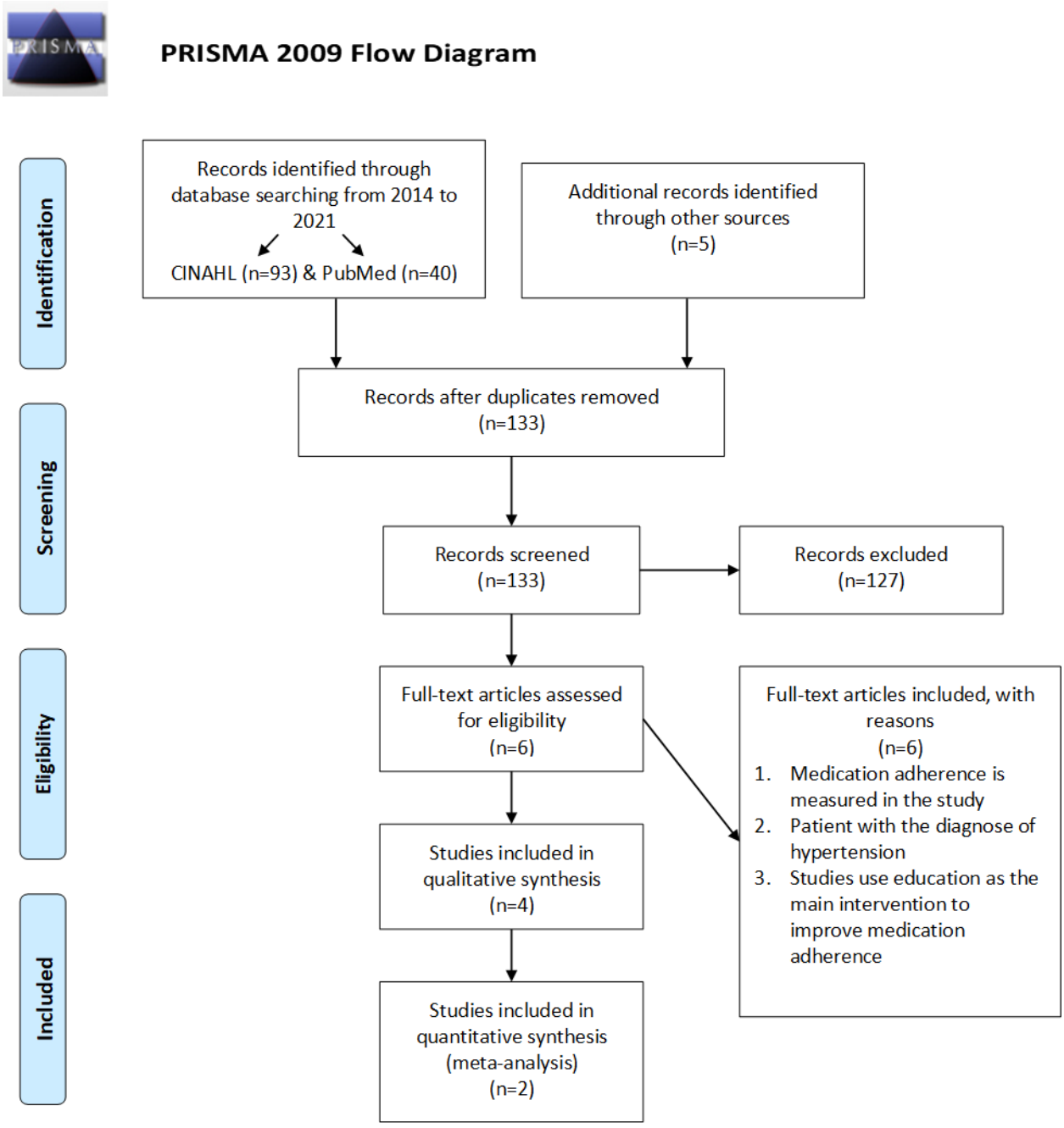
This paper intends to conduct a literature review to understand the factors for medication nonadherence and the effect of using an educational intervention to improve hypertensive patients' knowledge and medication adherence.

**Search Strategies**

The literature review was conducted by the author using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed databases from Florida International University's online library. A total of ninety-three articles were yielded by using keywords: "hypertension," "medication adherence," "educational intervention," and "adults" from the year 2014 to 2021 from CINAHL. A total of forty articles were yielded using the same keywords: "hypertension, medication adherence, adults and educational intervention" from the year 2014 to 2021 from PubMed. The language of the study was limited to English. The research region was not limited to the United States because the studies done by the United States were limited. The author reviewed titles, abstracts, and full-text and selected six articles that retained the PICO question. The author used a Google search engine to collect data from the World Health Organization, the Centers for Disease Control and Prevention, and the American Heart Association. The selected study needed to meet three criteria which were patients with a diagnosis of hypertension, measurement for medication adherence, and the use of educational intervention.

## Literature Review

The literature review is summarized in Chart-1:




*From:* Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., The PRISMA Group. (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. *PLoS Med 6*(7): e1000097. doi:10.1371/journal.pmed 1000097

**Through literature review, factors for medication nonadherence were listed as following:**

The reasons for medication nonadherence through literature were listed as hypertension was a disease with an "asymptomatic" and "lifelong nature" (World Health Organization, 2003). Hypertensive patients lacked awareness of their disease status and their diagnosis, target and recent blood pressure values (Pirasath, Sugathapala, and Wanigasuriya, 2020). Patients lacked awareness of the severity of hypertension. Patients were experiencing more adverse effects when take antihypertensive medications. Patients were not experiencing the apparent physical benefits of hypertensive medications (Ampofo, Khan & Ibitoye, 2020, p. 544). Forgetfulness was the common reason for medication nonadherence among hypertensive patients (Pirasath, Sugathapala, and Wanigasuriya, 2020).

**World Health Organization (2003, p. 111) identified five barriers for medication nonadherence, and they were the following:**

1. Socioeconomic-related factors
2. Health care team/health system-related factors
3. Condition-related factors
4. Therapy-related factors
5. Patient-related factors

**World Health Organization (2003) summarized interventions to improve medication nonadherence, which were the following:**

Literature showed methods to improve medication adherence including simplification of regimens (Kjellgren, Ahlner, Saljo, 1995; Wright, Lee & Chambers, 2000; as cited in the World Health Organization, 2003), educating on the use of medications ("Cholesterol, diastolic blood pressure, and stroke", 1995, as cited in the World Health Organization, 2003), building a good

patient-physician relationship ("Cholesterol, diastolic blood pressure, and stroke", 1995, as cited in the World Health Organization, 2003), and "continuous monitoring medication adherence and reassessment of treatment" (World Health Organization, 2003, p. 111).

There were two prescription strategies to improve medication adherence identified by Change et al. (2020) which were prescribing a fixed-dose fill of antihypertensive medications and prescribing longer fill days for medication supply.

**The effects of using an educational intervention to improve medication adherence in hypertensive patients were listed as following:**

The educational intervention showed "low to moderate quality evidence on improving medication adherence" (Tan, Cheng & Siah, 2019). Verbal education had a "small statistically significant effect" on improving medication adherence (Ampofo, Khan & Ibitoye, 2020, p. 543). Verbal educational intervention could improve "health literacy and consequent adherence" among hypertensive patients (Ampofo, Khan & Ibitoye, 2020, p. 544). There was an increase in medication adherence as the knowledge about hypertension increased (Ayodapo, Elegbede, Omosanya & Monsudi, 2020, p. 249). There was no significant difference between the use of bimodal or multimodal educational interventions. The bimodal educational interventions included the use of verbal and printed material. The multimodal educational interventions included the use of verbal, printed and electronic materials (Ampofo, Khan & Ibitoye, 2020).

Literature showed two assessment tools for assessing medication adherence. They were the Hill-Bone Medication Adherence Scale (HB-MAS) and Morisky Medication Adherence Scale (MMAS).

## The Project

**Project question:** will a video-based educational program improve hypertensive patients' knowledge and medication adherence among adults eighteen years and older in a primary care office?

**Problem**: hypertensive patients have a shortage of sufficient knowledge of hypertension and low medication adherence.

**Intervention**: a video-based educational program to improve hypertensive patients' knowledge and medication adherence.

**Current practice**: face-to-face education during an office visit

**Outcome**: there is an improvement in hypertensive patients' knowledge of hypertension and medication adherence.

## Project Goals and Outcomes

The goals of the quality improvement project are: first, to improve hypertensive patient's knowledge of hypertension. Patient's knowledge of hypertension is improved through their understanding of the lifelong nature of hypertension, complications of hypertension, hypertension classifications as stage 1, stage 2 and hypertensive crisis, the meaning of systolic and diastolic pressure, and hypertensive medication common side effects; and secondly, improve hypertensive patient's medication adherence using Hill-Bone Medication Adherence 9-item Scale (HB-MAS).

## Definition of Terms

Hypertension or high blood pressure is defined by the American Heart Association (AHA) (2021) as "the force of your blood pushing against the walls of your blood vessels is consistently too high." Hypertension is categorized as stage 1, stage 2 and hypertensive crisis.

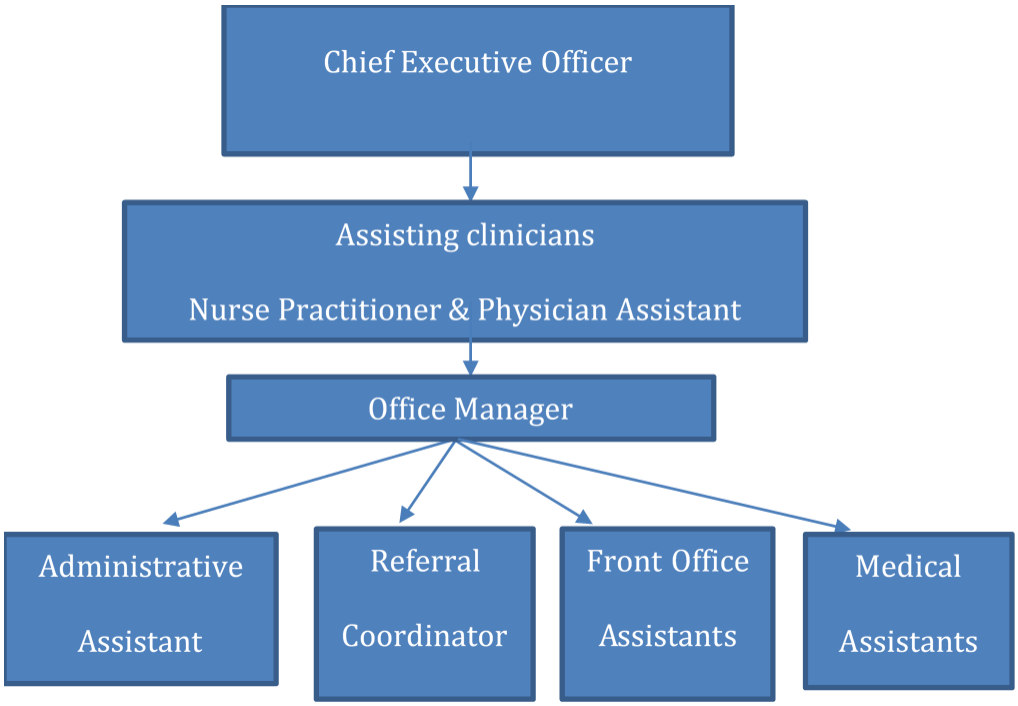
High blood pressure stage 1 is defined when the systolic blood pressure is 130 to 139 millimeters of mercury (mmHg), and the diastolic blood pressure is 80 to 89 mmHg. Hypertension stage 2 is when the systolic blood pressure is above 140 mmHg, and the diastolic blood pressure is 90 mmHg or higher. Hypertensive crisis is when systolic blood pressure is higher than 180 mmHg, and the diastolic blood pressure is higher than 120 mmHg (American Heart Association, 2021).

Medication adherence is defined as "the extent to which a person's behavior – taking medication, following a diet, and or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (Haynes, 1979; Rand, 1993; World Health Organization, 2003, p. 3). Patients who are adherent to medications means they have an agreement to treatments recommended by their healthcare providers (World Health Organization, 2003, p. 3).

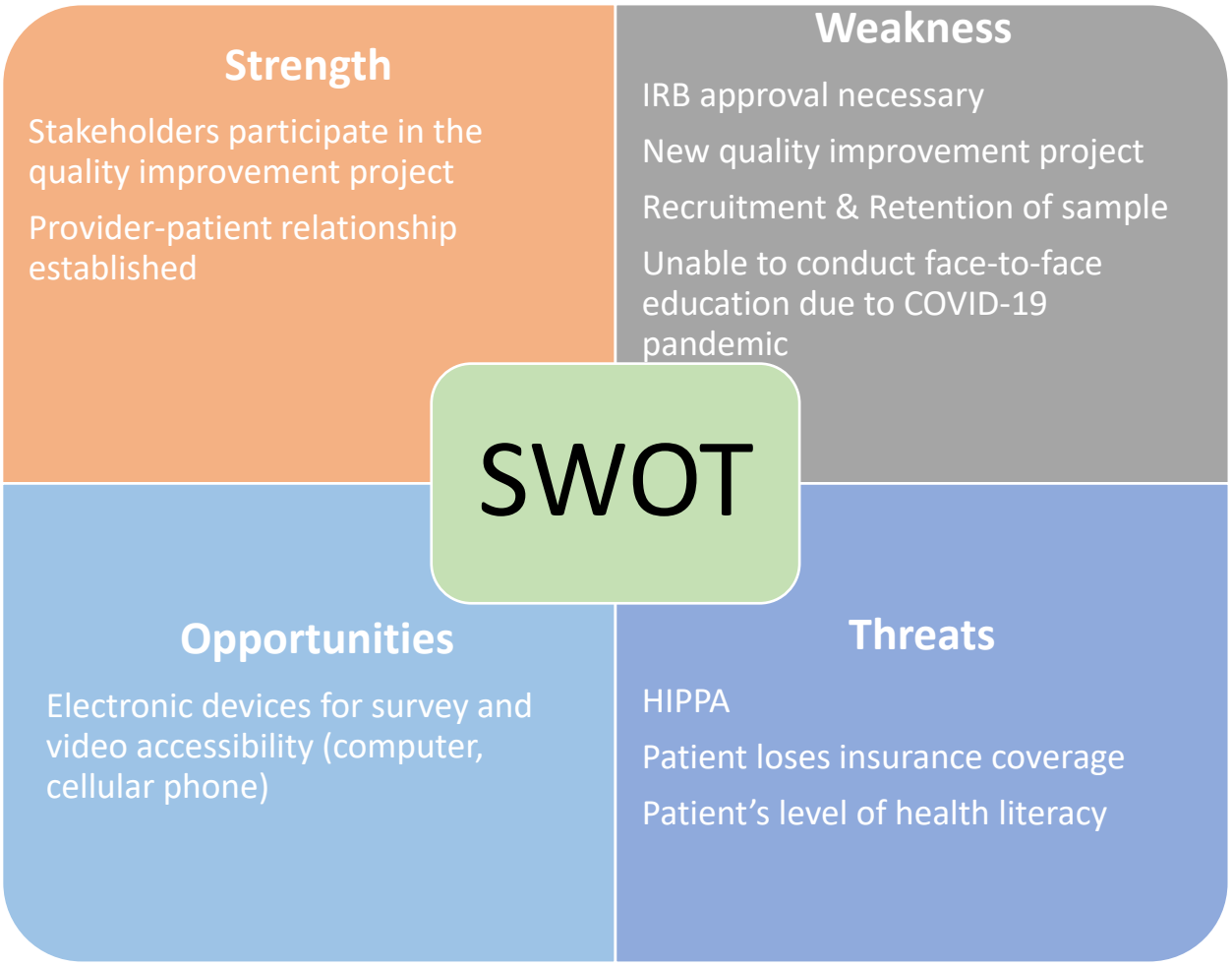
**Primary Care Office Structure**

The quality improvement project will be conducted in a primary care office located in Miramar, Florida. The office provides services that include family medicine, sick visits, sports physical, well women's exam, and weight loss program. In the office, there are one lead physician, one nurse practitioner and one physician assistant. I will be collaborating with the nurse practitioner to conduct the doctoral project. The stakeholder of the primary care office is the lead physician who is also the chief executive officer (CEO) and founder of the clinic. Under the leadership of the physician, there is one office manager, two front office assistants, one referral coordinator, one full-time medical assistant, and two part-time medical assistants. The organizational structure is illustrated in Table-1.

**Table-1: Organizational Structure**



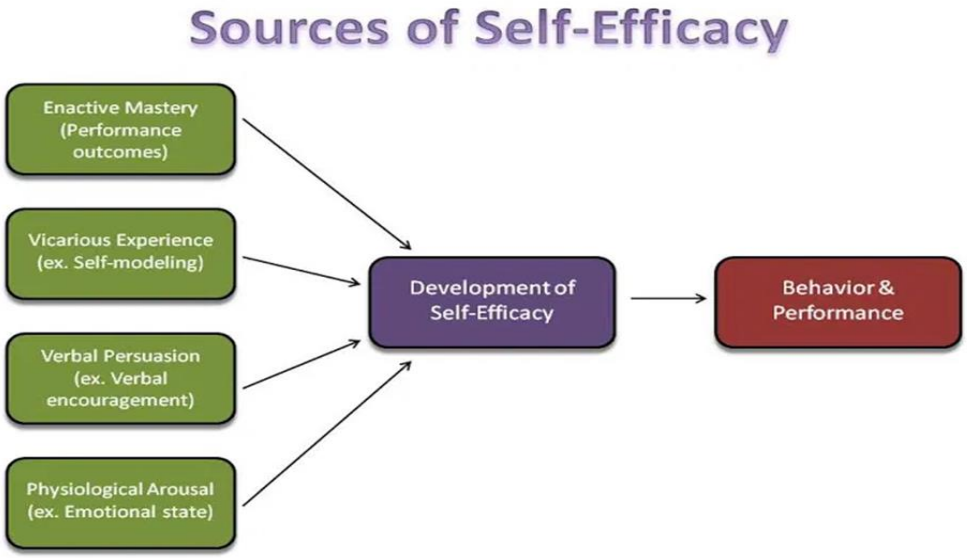
**SWOT Analysis**



## Conceptual Underpinning and Theoretical Framework of the Project

Bandura's self-efficacy theory was used as the theoretical framework to develop this quality improvement project. Self-efficacy was defined by Bandura (1997) as "an individual's judgment of his or her capabilities to organize and execute the course of action required to produce given attainments" (Bandura, 1997, as cited in Barnett, 2014). Bandura believed a person decides how to behave through a course of reflective thoughts, skills, and knowledge (Bandura, 1977). Self-efficacy theory had two components: self-efficacy and outcome expectations (Peterson & Bredow, 2013). Bandura (1977) suggested judgment about one's self-efficacy is based on four informational sources: (1) enactive attainment; (2) vicarious experience; (3) verbal persuasion or exhortation; and (4) physiological state or physiological feedback during a behavior (p. 195). Bandura's self-efficacy model is illustrated in Table-2. The author uses a video-based educational program as a verbal persuasion to encourage the hypertensive patient to develop self-efficacy behavior like being adherent to the medication regimen.

**Table-2: Sources of Self-Efficacy**



## Methodology

This is a quality improvement project using a pre-survey and post-survey design. The target population is patients aged eighteen years and older with hypertension that have been receiving medication treatment for more than three months in a primary care office. The target population size is twenty patients. Samples will be identified and selected by the patients' primary care physician. Recruitment will take place at Health Circle Clinic. Potential participants will be reached via email. With their consent, participants will be asked to complete an anonymous pre-survey. Each participant will receive a randomly assigned five-digit unique ID. Participants will use this assigned unique ID for the pre-survey and post-survey. The survey is designed to assess participants' knowledge about the nature of hypertension, hypertension complications, hypertension classification, medication side effects, and medication adherence. The pre-survey result will be used to create a targeted educational video based on the systematic review result. After completing the pre-survey, participants will be asked to watch an online educational video-based PowerPoint presenting hypertension education. Two weeks later, participants will be asked to complete an online post-survey. The pre-survey and post-survey are identical. Basic demographic information will be collected such as gender, age, ethnicity, and highest degree completed. The pre-survey and post-survey will be used to assess participants' knowledge and adherence to medication.

## Participants' Risks and Benefits

The potential benefits that participants may expect are improvement in their knowledge of the nature of hypertension, hypertension complications, blood pressure readings, and medication side effects. Participation is completely voluntary. Participants are not expected to experience any risk or harm by participating in this quality improvement project.

## Reliability and Validity of the Measuring Tools Applied in the Project

The instrument used in this quality improvement project was the Hill-Bone Medication Adherence Scale (HB-MAS). The permission for use was obtained from the Hill-Bone Scale team. The Hill-Bone Medication Adherence Scale is a nine-item scale. Responses to each question are four options: (1) all of the time; (2) most of the time; (3) some of the time; (4) none of the time. The scale scores are calculated by summing individual items. The highest total score is 36, and the lowest total score is 9. A higher score indicates high medication adherence, whereas a lower score indicates low medication adherence (Johns Hopkins University School of Nursing, 2021).

The medication adherence tool using the Hill-bone HBP compliance to high blood pressure therapy scale showed validity in assessing medication compliance (Chatziefstratiou, Giakoumidakis, Fotos, Baltopoulos & Brokalaki, 2019). The reliability and validity (R&V) of the Hill-Bone scale were validated by an expert panel and a relevant literature review (Johns Hopkins University School of Nursing, 2021).

## IRB Protocol Exemption

This quality improvement project had been approved by the Florida International University (FIU) Office of Research Integrity for implementation. The IRB approval letter is listed in Appendix.

## Results

### Patient Demographics

Out of twenty participants, thirteen participants were female, and seven were male. In the recruited sample, 65% were female, and 35% were male. The recruited sample was 30% aged sixty-five years and older, 70% aged between 25-year-old to 65-year-old. 65% sample were

identified as Asian, 10% were Black or African American, 10% Hispanic, and 15% were others. Participants' education levels were: 30% had graduated high school or equivalent, 25% had some college, 20% had graduated 12th degree or less, 15% had bachelor's degree, and 10% had master's degree. All twenty participants were diagnosed with hypertension and were receiving hypertensive medications. The patient's demographics are listed in Chart-2. Detailed patient's demographics are listed in Table-3.

**Chart-2 Patient's Demographics**

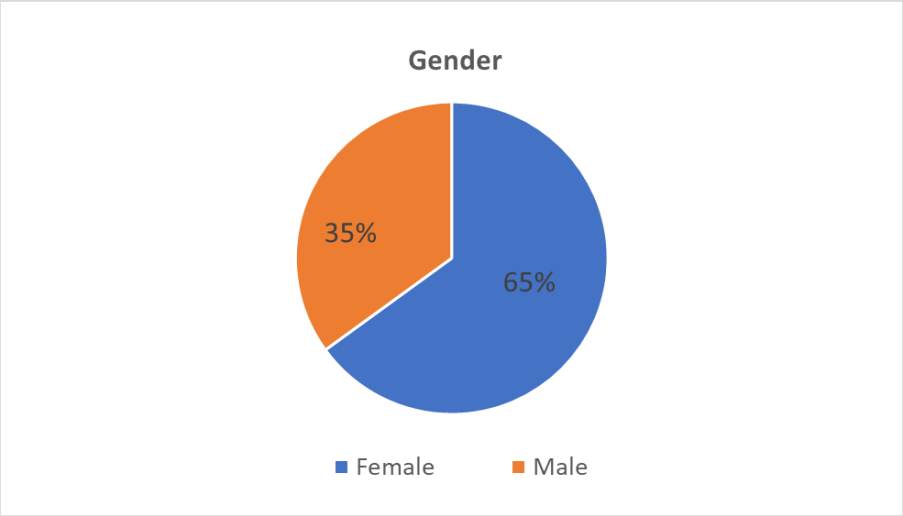



**Table-3: Patient's Demographics**

| **Gender** | **Number *n=20*** | **Percentage** |
|---|---|---|
| Males | 7 | 35 % |
| Females | 13 | 65 % |
| **Age** | **Number *n=20*** | **Percentage** |
| >65 years old | 6 | 30% |
| 25-65 years old | 14 | 70% |

| **Ethnicity** | **Number *n=20*** | **Percentage** |
|---|---|---|
| Asian | 13 | 65% |
| Black or African American | 2 | 10% |
| Hispanic | 2 | 10% |
| other | 3 | 15% |
| **Highest degree earned** | **Number *n=20*** | **Percentage** |
| 12th grade or less | 4 | 20% |
| Graduate high school or equivalent | 6 | 30% |
| Some college, no degree | 5 | 25% |
| Bachelors' degree | 3 | 15% |
| Master's degree | 2 | 10% |

**Hypertension Knowledge Result**

The author created five questions according to the literature to assess participants' knowledge of hypertension. The format of the questions was "yes" or "no". Five questions were identical from the pre-survey and the post-survey. These questions were listed as following:

1. Is hypertension a lifelong disease?
2. Do you know the complications of hypertension?
3. Do you know what the blood pressure numbers mean?
4. Do you know the high blood pressure classifications?
5. Do you know the common side effects of hypertensive medications?

For the first question, "is hypertension a lifelong disease", 70% of participants answered hypertension is a lifelong disease at the pre-survey. In a post-survey, 90% of participants answered that hypertension is a lifelong disease. There was a 20% increase in understanding the nature of hypertension as a chronic disease. The result is listed below:

**Pre-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 6 | 30.0 | 30.0 | 30.0 |
| | Yes | 14 | 70.0 | 70.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Post-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 2 | 10.0 | 10.0 | 10.0 |
| | Yes | 18 | 90.0 | 90.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

For the second question, “do you know the complications of hypertension”, 80% of participants answered “yes”, which showed they understand the complications of hypertension at pre-survey. At the post-survey, 90% of participants chose “yes” for understanding the complications of hypertension. A 10% increase of knowledge on understanding hypertension complications was observed. The result is listed below:

**Pre-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 4 | 20.0 | 20.0 | 20.0 |
| | Yes | 16 | 80.0 | 80.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Post-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 2 | 10.0 | 10.0 | 10.0 |
| | Yes | 18 | 90.0 | 90.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

For the third question, “do you know what the blood pressure numbers mean”, 70% of participants selected “yes” for the pre-survey by comparison to 95% participants answered “yes” for the post-survey. The post-survey showed a 25% increase in improvement of knowledge on understating the blood pressure readings. The result is listed below:

**Pre-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 6 | 30.0 | 30.0 | 30.0 |
| | Yes | 14 | 70.0 | 70.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Post-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 1 | 5.0 | 5.0 | 5.0 |
| | Yes | 19 | 95.0 | 95.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

For the fourth question, “do you know the high blood pressure classifications”, 45% of participants answered “yes”, which showed less than half of participants understood how to classify high blood pressure. At post-survey, 100% of participants learned how to classify high blood pressure. It showed an increase of 55% improvement on understanding high blood pressure classifications. The result is listed below:

**Pre-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 11 | 55.0 | 55.0 | 55.0 |
| | Yes | 9 | 45.0 | 45.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Post-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 20 | 100.0 | 100.0 | 100.0 |

For the fifth question, “do you know the common side effects of hypertensive medications”, 35% of participants answered “yes” at pre-survey. At the post-survey, 95% of participants answered “yes”. It showed a 60% improvement in understanding the common side effects of hypertensive medications. The result is listed below:

**Pre-survey**

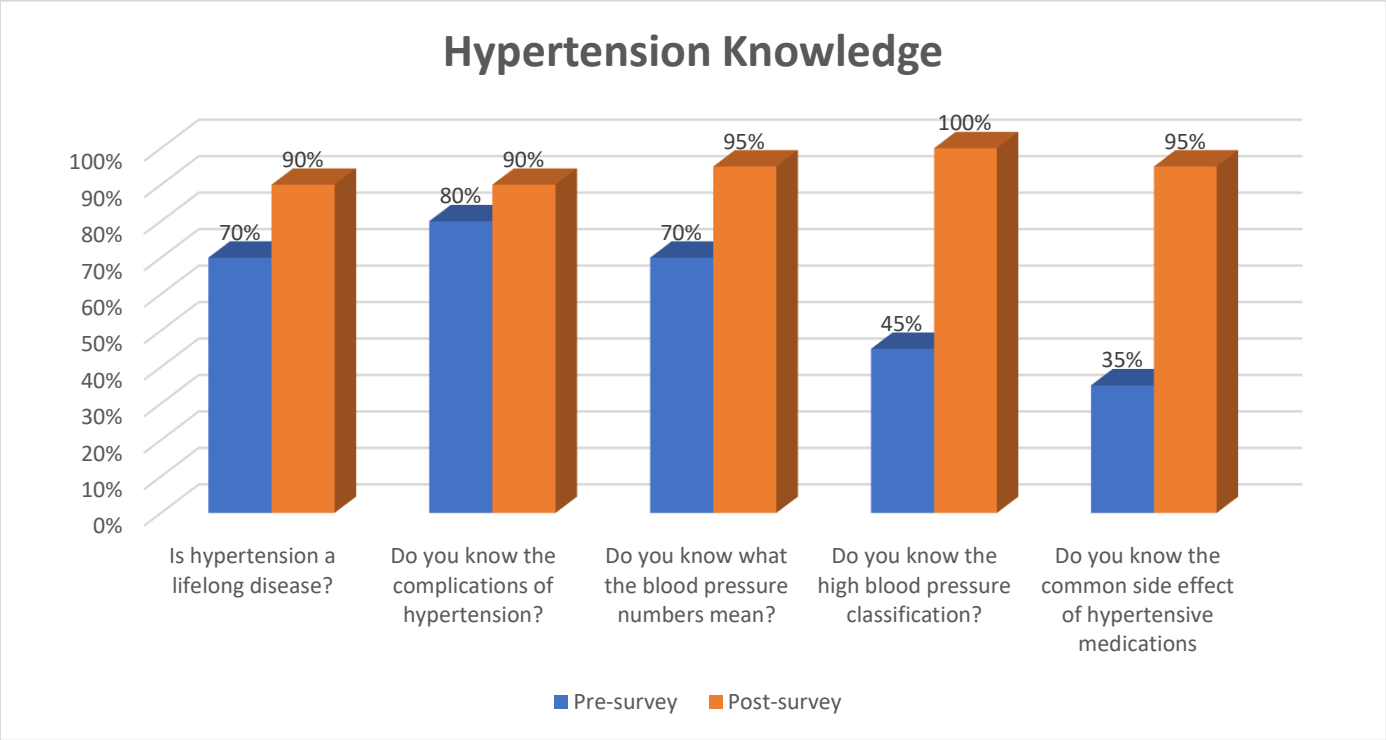
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 13 | 65.0 | 65.0 | 65.0 |
| | Yes | 7 | 35.0 | 35.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Post-survey**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 1 | 5.0 | 5.0 | 5.0 |
| | Yes | 19 | 95.0 | 95.0 | 100.0 |
| | Total | 20 | 100.0 | 100.0 | |

**Hypertension Knowledge of the Pre-survey and Post-survey is shown in Chart-3**

**Chart-3**




**Hill-Bone Medication Adherence 9-item Scale (HB-MAS) Score**

All twenty participants completed the pre-survey and post-survey. The minimum Hill-Bone Medication Adherence scale score for pre-survey was 17, and the minimum score for post-survey was 24. The pre-survey data showed the highest score of 36 in 30% of the participants. The post-survey showed an increase of 15% (45%). Pre-survey had a mean score of 32.25, and post-survey had a mean score of 33.10. The standard deviation of the pre-survey was 4.84, and the standard deviation of the post-survey was 3.91. There was a variance score of 23.39the  for pre-survey and a variance score of 15.29 for the post-survey. The post-survey, when compared to the pre-survey, showed a 40% increase in medication adherence, a 30% decrease in medication adherence, and a 30% no change in medication adherence.

The common reason for medication nonadherence is patients forget to take their

medications. 40% of participants forgot to take their medications some of the time at pre-survey. At post-survey, 30% of participants sometimes forgot to take their medications. This result is consistent with a study done by Al-Ramahi (2014) which showed 58.2% of 450 participants sometimes forget to take their high blood pressure pills using the Morisky scale.

The result is summarized in Table-4:

**Table-4: Pre-survey and post-survey Score**

Pre-survey score

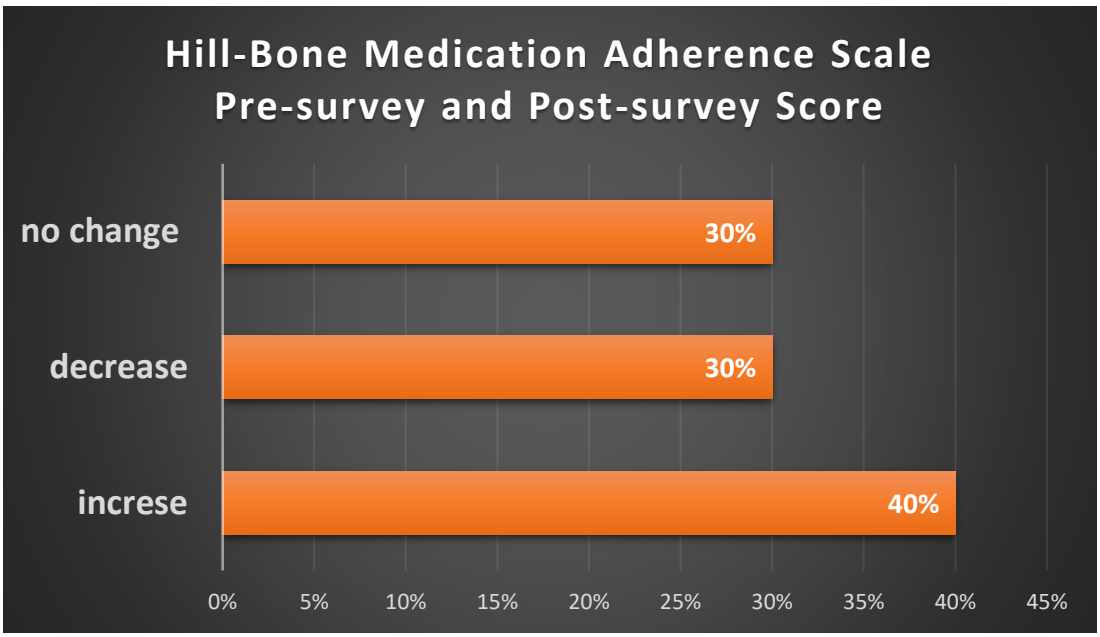
| # | Field | Minimum | Maximum | Mean | Std Deviation | Variance | Count |
|---|---|---|---|---|---|---|---|
| 1 | Score | 17.00 | 36.00 | 32.25 | 4.84 | 23.39 | 20 |

Post-survey score

| # | Field | Minimum | Maximum | Mean | Std Deviation | Variance | Count |
|---|---|---|---|---|---|---|---|
| 1 | Score | 24.00 | 36.00 | 33.10 | 3.91 | 15.29 | 20 |

The result of the pre-survey and post-survey using Hill-Bone Medication Adherence 9-item Scale (HB-MAS) Score is listed in Chart-4.

**Chart-4**




## Discussion

### Limitation and Strength

This quality improvement project aims to increase hypertensive patients' knowledge of hypertension and their medication adherence. The study's strength is that it used validated tools such as Hill-Bone Medication Adherence 9-item Scale (HB-MAS) to assess hypertensive patients' medication adherence. The other strength of the study is it utilized the result of the literature to develop a video-based educational program, which focused on improving patients' knowledge on understanding the "lifelong nature" of hypertension, blood pressure classifications, and blood pressure readings. The limitation of the quality improvement project is its small sample size. The recruited sample was 20. Due to the Covid-19 pandemic, face-to-face education was not feasible. The author could not collect direct feedback from participants using a

video-based education. Another limitation is that its post-survey was collected two weeks after the video-based education. The long-term effect of a video-based educational program was not measured.

**Implications for Advanced Practice Nursing**

As an advanced practice nurse practitioner, it is important to manage the patient with hypertension and decrease complications caused by hypertension. It is also crucial to understand the reasons that the patient is non-adherent to medication. This study provides insight for advanced nurse practitioners to understand the multifactorial factors for medication nonadherence. This project also provides strategies and assessment tools for advanced nurse practitioners to assist patients with medication adherence. It listed information for the advanced nurse practitioner to understand what knowledge that hypertensive patient is lacking that causes patient's medication nonadherence. This video-based educational program focused on hypertensive patients' knowledge deficiency on understanding the "lifelong nature" of hypertension, its complications, its classifications, and medication common side effects. It is the advanced nurse practitioner's responsibility and accountability to not only treat hypertensive patients, but to ensure patients' adherence to treatment. This quality improvement project showed the need for an advanced nurse practitioner to continuously educate patients to improve patients' knowledge and promote patients' self-efficacy in managing their diagnosis.

**Dissemination**

This quality improvement project will be created as a PowerPoint presentation and will be presented to the faculty of the Nicole Wertheim College of Nursing and Health Science at the Florida International University and the stakeholder of the primary care clinic. This project will be submitted to the Sigma Theta Tau International Honor Society of Nursing for congress in

2022.

Reference

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## Appendix A

Hill-Bone Medication Adherence Scale (HB-MAS)

| No. | Item | Response:<br>1. All of the Time<br>2. Most of the Time<br>3. Some of the Time<br>4. None of the Time |
|---|---|---|
| 1 | How often do you forget to take your **high blood pressure** medicine? | |
| 2 | How often do you decide NOT to take your **high blood pressure** medicine? | |
| 3 | How often do you forget to get prescriptions filled? | |
| 4 | How often do you run out of **high blood pressure** pills? | |
| 5 | How often do you skip your **high blood pressure** medicine before you go to the doctor? | |
| 6 | How often do you miss taking your **high blood pressure** pills when you feel better? | |
| 7 | How often do you miss taking your **high blood pressure** pills when you feel sick? | |
| 8 | How often do you take someone else's **high blood pressure** pills? | |
| 9 | How often do you miss taking your **high blood pressure** pills when you are careless? | |

**Note:**
This 9-item scale has broad application across various chronic diseases and conditions for self-assessment of medication adherence. The words "**high blood pressure"** may be replaced with other conditions as applicable.

Details on scale scoring and psychometric properties are provided in the references below:

Kim, M.T., Hill, M.N., Bone, L.R., Levine, D.M. Development and testing of the Hill- Bone compliance to high blood pressure therapy scale. Progress in Cardiovascular Nursing Summer 2000, 90-96. https://www.ncbi.nlm.nih.gov/pubmed/10951950

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## Appendix B

Educational content

Hypertension education link: https://youtu.be/dKVXiScnWwo

- Your blood vessels are like water pipes. Your blood pressure is like the water inside the pipe. The organs are the target. The higher the uncontrolled blood pressure the more damage it does to your organs. If you do not control your blood pressure well, you can end up with dialysis, stroke, vision loss, and erectile dysfunction.
- High blood pressure is a lifelong disease that needs lifelong medication treatment. High blood pressure is a “silent killer”; it has no symptoms. You can know your blood pressure only by measuring it. High blood pressure is often the first domino in a chain or “domino effect” leading to devastating consequences, like coronary heart disease (MI), stroke, heart failure, kidney disease/failure, vision loss, and erectile dysfunction.
- Your blood pressure is recorded as two numbers: systolic blood pressure (the first number) – indicates how much pressure your blood is exerting against your artery walls when the heart beats. Diastolic blood pressure (the second number) – indicates how much pressure your blood is exerting against your artery walls while the heart is resting between beats.
- Blood pressure classifications: blood pressure numbers of less than 120/80 mm Hg are considered within the normal range. Elevated blood pressure is when readings consistently range from 120-129 systolic and less than 80 mm Hg diastolic. Hypertension Stage 1 is when blood pressure consistently ranges from 130-139 systolic or 80-89 mm Hg diastolic. Hypertension Stage 2 is when blood pressure consistently ranges at 140/90 mm Hg or higher. Hypertensive crisis, this stage of high blood pressure requires medical attention. If your blood pressure readings suddenly exceed 180/120 mm Hg, wait five minutes and then test

your blood pressure again. If your readings are still unusually high, contact your doctor immediately. You could be experiencing a hypertensive crisis.

| BLOOD PRESSURE CATEGORY | SYSTOLIC mm Hg (upper number) | | DIASTOLIC mm Hg (lower number) |
|---|---|---|---|
| NORMAL | LESS THAN 120 | and | LESS THAN 80 |
| ELEVATED | 120 – 129 | and | LESS THAN 80 |
| HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1 | 130 – 139 | or | 80 – 89 |
| HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2 | 140 OR HIGHER | or | 90 OR HIGHER |
| HYPERTENSIVE CRISIS (consult your doctor immediately) | HIGHER THAN 180 | and/or | HIGHER THAN 120 |

- What are the medication's side effects? For many people, high blood pressure medicine can effectively lower blood pressure, but some types may cause side effects. Tell your health care provider if you have side effects. But don’t stop taking your medicine on your own to avoid them. Your health care provider can work with you to find the medication or dose that works best for you.
- Here are some of the common side effects that may occur:
    - Weakness, tiredness, or drowsiness
    - Trouble sleeping
    - Slow or fast heartbeat
    - Skin rash
    - Feeling thirsty
    - Cough
    - Muscle cramps
    - Headache, dizziness, or light-headedness
    - Constipation or diarrhea

## Appendix C-1

Pre-survey

Part I

Demographic information

Initial:_____ Gender: Male Female Age: _____

Race:_____ Education:_____

Part II

Hypertension knowledge

1. Is hypertension a lifelong disease?
   a. Yes b. No
2. Do you know the complications of hypertension?
   a. Yes b. No
3. Do you know what the blood pressure numbers mean?
   a. Yes b. No
4. Do you know the high blood pressure classifications?
   a. Yes b. No
5. Do you know the common side effects of hypertensive medications?
   a. Yes b. No

Part III

Medication adherence

6. Do you forget to take your high blood pressure medicine?
   1) All of the Time
   2) Most of the time

3) Some of the time

4) None of the time

7. Do you decide NOT to take your high blood pressure medicine?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

8. Do you miss taking your high blood pressure pills when you feel better?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

9. Do you miss taking your high blood pressure pills when you feel sick?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

10. Do you miss taking your high blood pressure pills when you are careless?

    1) All of the time

    2) Most of the time

    3) Some of the time

    4) None of the time

## Appendix C-2

Post-survey

Part I

Demographic information

Initial:_____ Gender: Male Female Age: _____

Race:_____ Education:_____

Part II

Hypertension knowledge

1. Is hypertension a lifelong disease?

   b. Yes b. No

2. Do you know the complications of hypertension?

   b. Yes b. No

3. Do you know what the blood pressure numbers mean?

   b. Yes b. No

4. Do you know the high blood pressure classifications?

   b. Yes b. No

5. Do you know the common side effects of hypertensive medications?

   b. Yes b. No

Part III

Medication adherence

6. Do you forget to take your high blood pressure medicine?

   1) All of the Time

   2) Most of the time

3) Some of the time

4) None of the time

7. Do you decide NOT to take your high blood pressure medicine?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

8. Do you miss taking your high blood pressure pills when you feel better?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

9. Do you miss taking your high blood pressure pills when you feel sick?

   1) All of the Time

   2) Most of the Time

   3) Some of the Time

   4) None of the Time

10. Do you miss taking your high blood pressure pills when you are careless?

    1) All of the time

    2) Most of the time

    3) Some of the time

    4) None of the time

## Appendix D

Informational Letter

**A video-based educational program in improving knowledge and adherence to medication among hypertensive patients aged eighteen years and older in a primary care office. A quality improvement project.**

Hello, my name is Ronghua Bao, ARNP. I am a DNP student at the Nicole Wertheim College of Nursing and Health Science at Florida International University. You have been chosen at random to be in a research study about improving hypertensive patients' knowledge about hypertension and medication adherence. The purpose of the quality improvement project is to improve hypertensive patients' knowledge about hypertension, hypertension complications, hypertension classifications, blood pressure reading, medication side effects, and medication adherence. This quality improvement aims to improve hypertensive patients' blood pressure control and decrease the risk of complications caused by high blood pressure. If you decide to be in this study, you will be one of twenty people in this research study. Participation in this study will take two weeks of your time.

If you decide to participate in this project, you will be asked to complete a pre-test which takes approximately ten minutes. Then, you will be asked to view an online educational video which takes approximately ten minutes. Two weeks later, you will be asked to complete a post-test which takes approximately ten minutes. The survey questions will be administered via Qualtrics. It is a data company that is used to design, send, and analyze surveys. The survey questions will be uploaded into Qualtrics. Qualtrics will generate a QR code that will be sent to the participants via email. Participants will be instructed to answer the survey questions and submit them back to the researcher.

There is no cost or payment to you. If you have questions while taking part, please stop me and ask. You will remain anonymous.

If you have questions for one of the researchers conducting this study, you may contact the primary investigator Dana Sherman, DNP, ARNP, ANP-BC at (305) 348-2247, FNP-BC, or Ronghua Bao, ARNP, MSN, DNP student at (305) 877-8219.

If you would like to talk with someone about your rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu or by mail at 11200 SW 8$^{th}$ Street, AH3-522, Miami, Florida 33199.

Your participation in this research is voluntary, and you will not be penalized or lose benefits if you refuse to participate or decide to stop. You may keep a copy of this form for your records. However, all clinical issues or questions should continue to be directed to your treating physician.

## Appendix E

Letter of Support

Date: 06/20/2021
Dana Sherman, DNP, APRN, ANP-BC, FNP-BC
Clinical Assistant Professor

Nicole Wertheim College of Nursing and Health Sciences
Florida International University

Dear Dr. Sherman:

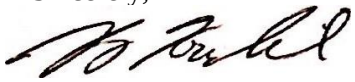
Thank you for inviting Health Circle clinic to participate in the DNP Project of Ronghua Bao. I understand that this student will be conducting this project as part of the requirements for the Doctor in Nursing Practice program at Florida International University. After reviewing the proposal of the project titled "*A video-based educational program in improving knowledge and adherence to medication among hypertensive patients aged eighteen years and older in a primary care office: A quality improvement project*." I have warranted her permission to conduct the project in this clinic.

The project will be implemented at Health Circle and will occur in two sessions during a two-week timeframe, using pre-and post-test surveys to assess impact. We are also aware of our patient participation in supporting the student to complete this project, including warrant the student access to our facilities, give consent, deliver the pre-test questionnaire, provide the educational intervention, and two weeks after providing the posttest to the recruited participants. Health Circle will provide the necessary means to assist the student with her project. Due to COVID, all educational intervention and assessments will be provided virtually.

This project intends to evaluate if a video-based education will improve hypertensive patients' knowledge about hypertension and their medication adherence. The project will be conducted with consent of potential participants receiving care in our facilities. Prior to the implementation of this project, the Florida International University Institutional Review Board will evaluate and approve the procedures to conduct this project. Evidence suggests that a patients' knowledge about hypertension and its treatment is a prerequisite to medication adherence. Furthermore, increasing patient's knowledge about hypertension, and medication adherence assessment and management will lead to improvement in our patient's healthcare indicators, reduce healthcare costs, and improve patient's quality of life.

We expect that Ronghua Bao will not interfere with the normal office performance, behaving in a professional manner and following the office standards of care. As owner of the Health Circle clinic, I support the participation of our patients in this project and look forward to work with you.

Sincerely,



Robert S. Tomchik, MD

## Appendix F

Florida International University IRB Approval Letter

FIU | FLORIDA INTERNATIONAL UNIVERSITY

**Office of Research Integrity**
**Research Compliance, MARC 414**

**MEMORANDUM**

**To:** Dr. Dana Sherman
**CC:** Ronghua Bao

**From:** Maria Melendez-Vargas, MIBA, IRB Coordinator

**Date:** August 24, 2021

**Protocol Title:** "A video-based educational program in improving knowledge and adherence to medication among hypertensive patients aged eighteen years and older in a primary care office: A quality improvement project."

---

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

**IRB Protocol Exemption #:** IRB-21-0374 **IRB Exemption Date:** 08/24/21 **TOPAZ Reference #:** 110642

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

***Special Conditions:*** N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

MMV/em

# Appendix G

Permission to use the Hill-Bone Scales

**SON-HillBone** <SON-HillBone@jhu.edu> Jan 25, 2021, 9:49 PM
to trigger@qemailserver.com, me

Hi Ronghua,

Please consider this email and the automatic confirmation message received as permission to use the Hill-Bone Scales.

Attached are the Hill-Bone Scales along with several relevant articles reporting on the validation and use of the scales. Please cite the scale using the references provided. We would appreciate you sharing the findings of your research with us.

**In the scoring guide, there is a note under the table that provides instructions on how to obtain a sum score for adherence. We do not recommend specific cut-offs, but rather, examining adherence on a continuous scale. For instance, for the 9-item HB-MAS, if a participant reports "None of the Time" for all the 9 questions, their total adherence score would be 36 points which indicate high adherence.**

We wish you the very best in your project and please do not hesitate to reach out to us if you have any follow-up questions.
**Please do not share these scales with anyone who has not obtained permission for their use.**

Kind Regards,
The Hill-Bone Scales Team