

BARRIERS TO MEDICATION ADHERENCE IN THE HISPANIC POPULATION

Barriers to medication adherence in the Hispanic population

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ABSTRACT

Medication Adherence is ‘the degree to which the person’s behavior corresponds with the agreed recommendations from a health care provider’ as stated by the World Health Organization, they also outline five interacting dimensions affecting medication non-adherence: social/economic factors, therapy-related factors, patient-related factors, condition-related factors and health system/health care team-related factors. A systematic review was conducted evaluating various different literature found as to why non-adherence rates were so high among Hispanics. One of the key components found was that enhancing cultural sensitivity and health literacy is needed to increase Hispanics’ access to and utilization of health services, moreover for controlling chronic diseases, encouraging healthy lifestyles, obesity prevention, workplace safety and utilization of preventative and screening services (Velasco-Modragon et al 2016).

CHAPTER 1: INTRODUCTION

Non adherence is a wide spread problem within the generalized population problem, but it is of greater concern within the Hispanic population, which happen to be the majority group in the United States as of July 1, 2016; the United States Census Bureau (2016) estimated that there are 56.6 million Hispanics living within the United States as of July 1,2015, people of Hispanic origin make up the nation's largest ethnic or racial minority; they constitute 17.6 percent of the nation's total population. The projected number of Hispanics for 2060 is 119 million people; California has the largest Hispanic population of any state at 15.47 million people. Healthcare access is still a big problem within the Hispanic population even after the passage of the Affordable Care Act in 2010. There are approximately 21.4% of Hispanics living in poverty as of 2015, with poverty comes lack of access to healthcare. In 2015 there were 16.2% of Hispanics who lacked access to healthcare. Forty seven percent of rural Hispanic babies are born poor, compared to 41 percent of Hispanic babies in urban areas, the tracking of children in the state of California they found that children often have trouble excelling in school because their homes are overcrowded and they have nowhere to do their homework (Wiltz 2015). Very few go on to college very few will escape poverty once they hit adulthood. Poor adherence to prescribed regimens can result in a serious of health consequences; studies have shown that approximately 50% of patients do not take their medication for chronic conditions as prescribed. Nationally

non-adherence costs the healthcare system and estimated \$100 to \$289 billion annually (American Pharmacist Association).

As stated by White (2014) “adherence is complex and multifactorial, but non-adherence rates appear to be higher in non-white patients, including the Latino Population.” It is critical to find techniques that work in order to increase compliance to a population that is so fast growing within our state of California alone. Improving adherence will prevent unnecessary emergency room visits, hospitalizations and long-term poor health outcomes and increases in health care cost. Medication non-adherence has been found to be a major problem within the Hispanic population. Various causing factors have been evaluated as to why Hispanics are non-compliant with their medication regiment. Some of the different factors that have been evaluated are cost, acculturation, medication access, healthcare access, pharmacy hours, cultural influences and quality of physician-patient relationships (Compton et al 2010).

Hispanics are the largest ethnic minority group in the United States, they are also disproportionately affected by poor conditions of daily life affected by structural and social factors, i.e.: macroeconomics, cultural values, income, education, occupation, and social support systems including health services Health inequalities specifically to Hispanics are those related to socioeconomic, ethnic, and gender population subgroups. Risk factors for non-communicable diseases along with lack of health care access make Hispanics disproportionately vulnerable to disease and death (Velasco-Mondragon, Jimenez, Palladino-Davis, Davis, Escamilla-Cejudo, 2016). The Center for Disease Control (CDC), 2015 reports that the leading cause of disease among Hispanics is heart disease, cancer, and uncontrolled high blood pressure. Historically it has been found that Hispanics in the United States have less access to health services and they utilize fewer preventative care services than any other ethnic groups (CDC, 2014)

Medication adherence is a major problem within the Hispanic population. Lack of healthcare not only impacts a patient's health but quality of life as well, it is only one of the many hurdles that Hispanics face when treating acute or chronic health problems. There could be many different reasons on why patients of Hispanic origin do not adhere to the medication regimen as prescribed by their provider. Some of the reasons could be due to cost of medication, patients' understanding of the pathophysiology of the disease, mechanism of use of medication, side effects of medication some of these variables are not within the control of the provider such as the cost but the other variables are very much under the control of the provider prescribing the medication.

As Colby et al found in their study the relationship between provider and patient are key components to a patient's medication adherence. Education is key when a provider is prescribing new medications to patient's, explaining mechanism of action gives the patient full understanding of how the medication functions and what to expect in reference to side effects what is normal and not a normal response to a medication. Fully explaining of how long it will take for the medication to take effect and what to expect from then on will make the patient feel empowered and educated about their disease process therefore making them more compliant in taking their medication.

CHAPTER 2: LITERATURE REVIEW

A literature review was conducted with the objective of finding out what barriers existed within the Hispanic population that prevented them from being compliant with their medication regimen. Velasco et al (2016) conducted a literature review on the general health of Hispanics throughout the United States, they examined how Hispanics are disproportionately affected by poor conditions of daily life, shaped by structural and social factors such as: macroeconomics, cultural values, income, education, occupation, and social support systems, including health services which are known as social determinants of health (SDH). SDH cause health effects on individuals through the inability to achieve homeostasis due to physiological or behavioral changes, risk factors for non-communicable diseases along with decreased health care access make Hispanics disproportionately vulnerable to disease and death. Hispanics historically have less access to healthcare services and they utilize fewer preventative care than other ethnic groups (National Center for Health Statistics-Center for Disease Control 2014).

Some of the most important underlying factors affecting Hispanics in the USA are obesity, tobacco, smoking and alcohol intake. Obesity is a common denominator in the development of metabolic syndrome, non-alcoholic fatty liver disease, diabetes and cardiovascular disease it also increases the risk for several forms of malignancies (Cheikh et al 2014). The high numbers of obesity in Hispanics is multifactorial, food and beverage marketing Hispanics promotes the consumption of low-nutrient, calorie-dense foods and beverages especially among children. Tobacco use among second-generation Hispanics is the highest, which increased their risk for cardiovascular disease and cancer. Daily alcohol consumption is very common within Hispanics, which places them at higher risk for liver disease making it the sixth most common cause of death. Cardiovascular disease is the second leading cause of death in Hispanics, significant risk

factors include hyperlipidemia and hypertension. In 2018 cancer was estimated to be the leading cause of cancer in Hispanics with an incidence rate of 149,100 new cases will be diagnosed yearly and a fatality rate of 30 percent (Miller et al 2018). Prostate cancer is the most common in Hispanic men followed by colorectal and lung, among women breast cancer is the leading cause followed by lung and colorectal.

Medication adherence is a key component to prevention and treatment of diseases. White 2014 stated in their pharmacy review article that language was a critical barrier to medication adherence in the Hispanic population. The lack of language accordance between physician and patient is associated with a higher likelihood of miscommunication. Spanish speaking patients are less likely to receive medication side effect information from their physicians and are more likely to have adverse reactions to medications because they do not understand the instructions for medication use. Language barriers encountered at the pharmacy can also have an effect on medication adherence, they found that 44 percent of Latinos with limited English proficiency receive written medication information in Spanish when picking up a new prescription from their pharmacy; only 47 percent received medicine bottles labeled in Spanish. They also found that patients who used an interpreter at the pharmacy were more likely to receive important medication counseling including purpose of the medication and side effects.

Palacio et al. (2014) conducted a randomized study testing the comparative effectiveness of a telephone-based behavioral intervention versus and educational DVD at improving 12-month adherence to thienopiridines among minority coronary stent recipients. Patients were recruited through a database of a health benefits company (Humana, Inc) throughout 22 states. Members were chosen through the identification if International Classification of Diseases (ICD) and current procedural terminology (CPT) codes or diagnosis related group (DRG) per encounter

visit. There had to be a medical claim for a drug-eluting stent (DES) or a bare metal stent (BMS) 90 days prior to start of research, as well as having filled at least one prescription for clopidogrel or prasugrel and be of 18 years of age.

There was a total of 452 subjects found to be eligible to participate in the study 44% were Hispanic 56% black, recruitment letters were sent to all subjects. The letter included an opt-out option, patients that identified as being of Hispanic origin received the letter in English and Spanish, and a bilingual recruiter also contacted them. After obtaining consent the subjects were then randomized on 1:1 ratio to either a phone-based motivational interviewing (MINT) or a mailed role-modeling DVD. The first manner in which adherence was measured through medication possession ratio (MPR), they used pharmacy claims data for each subject that were obtained 6 months after all subjects had completed the study. The second was the self-reported medication adherence using the four- item Morisky Medication Adherence Scale (MMAS-4). The results found that the percentage of adherence within the MINT group was 64% and 50% in the DVD group.

Diabetes affects Hispanics at a much higher rate than their counterparts. The CDC reports that 50% of Hispanic adults in the United States are expected to develop the chronic disease, a rate that is higher than the average adult. Cabarello et al (2018) conducted a Quantitative study to predict medication adherence in older Hispanic patients with type 2 diabetes. They looked at the Executive control function (ECF) as an element of cognition that is of special interest in patients with type 2 diabetes. ECF focuses on the ability to process information and appropriately respond to it, the 3 most common studied domains are concept, shifting, working memory and response inhibition. It has been found that Hispanics are at higher for genotype variations in haptoglobin that may affect ECF and disease management in older patients with type 2 diabetes

(Liu et al 2017). The objective of the study was to examine the patient's performance on either the (CLOX 1) which the patients draw a clock with a specific time or the 25-item Executive interview which is an orally administered test consisting of 25 questions that involve either naming objects that start with a particular letter within a given period of time, following commands and drawing figures (Cabarello et al 2018).

The participants were recruited at an outpatient university-based healthcare clinics, community centers and the local community via posted flyers. Inclusion criteria consisted of the patient being ambulatory, residing in the community, Hispanic ethnicity, and age of 65 years or older with a diagnosis of type-2 diabetes. They completed the study in their preferred language and also received a \$20.00-dollar gift card for participating in the study. The control group consisted of patients with a HbA1C levels of <7%, random glucose fingerstick was performed to identify any potential participant who might be hypoglycemic and possibly score low on the cognitive tests. There was a total of only 40 participants who qualified to participate in the study, with the mean age being 74.95; hypertension and hyperlipidemia were identified in 90% of patients. The results were that they found a correlation between self-reported medication adherence and CLOX 1 scores, which indicated a cognitive decline with a decrease in type-2 diabetes medication adherence, inversely the Visual Analog Scores were correlated with HbA1C levels.

Hu, Amirehsani, Wallace, & Letvak (2013), performed a qualitative study evaluating Perceptions of Barriers in Managing Diabetes: Perspectives of Hispanic Immigrant Patients and Family Members. The researchers used a 5-focus group interview that totaled 73 Hispanic immigrants with type 2-diabetes along with family members / significant other who were allowed to participate as well. The study was conducted from 2010-2012; Participants were recruited from a free health clinic located in central North Carolina. Eligibility criteria consisted

of the participant identifying as being Hispanic, over the age of 18, with a medical diagnosis of Type 2 diabetes, the study was approved by the IRB. The data was collected through focus group interviews; focus groups consisted of both family members and patients with 7 to 16 persons per group. Open-ended questions were used to explore patients' and family member's perceptions of barriers to diabetes self-management. The focus groups were facilitated in Spanish by one of the author's conducting the study, a bilingual nurse practitioner, and a bicultural and bilingual native Spanish interpreter lay worker. Each session lasted approximately 20-30 minutes and each participant received a \$10.00 Wal-Mart gift card to compensate them for their time. The group discussions were audiotaped and transcribed in Spanish by a bicultural, bilingual research team-member; the Spanish transcriptions were then translated back to English to verify accuracy. The research team analyzed the text to identify barriers to diabetes management using thematic content analysis. Line-by-line coding of interview text was conducted by members of the team and mutually agreed upon. The average age of participants was 50 y.o, and for family members/significant others was 41 y.o. Majority of the participants were female (75%) with a mean Hemoglobin A1C of 8.11%. Half of the participants reported taking an oral hypoglycemic (68.8%) and 21.9% reported taking insulin injections. 77.8 % percent of participants were from Mexico origin with an average length of 15.1 years in the United States.

There were 3 major barriers to self-management identified by Hispanics with diabetes, the first one was the sense of suffering not only physical but also emotional. Second were difficulties in managing the disease by not being able to enjoy food with family members because it made them feel isolated from the family. Thirdly, lack of resources and family support was the last barrier identified in the research; having the funds available to purchase medications

was a big issue along with lack of family support for dietary changes and lack of understanding of diet restrictions.

Hu et al (2013) recommended that very tailored interventions should be set in place to improve medication regimen compliance within the Hispanic population, which is to provide intervention and educational programs specifically targeting Hispanics that include immediate family members, extended family members, and friends. The researchers stated, “To overcome barriers to diabetes self-management, health providers and communities must build partnerships to deliver culturally acceptable activities and care for both patients and family member.” This is a key component in treating the Hispanic population as a whole and finding interventions to increase quality and quantity of life expectancy.

Hu et al (2014) also conducted a systematic review investigating the effectiveness of interventions to improve medication adherence in ethnic minorities from January 2000 to August 2012. As stated by the researchers “medication non-adherence presents a significant barrier to delivering appropriate health care”. Their sample population consisted on any of the following ethnic sub-groups (African-American, Hispanic or Asian); they reviewed and synthesized a total of 36 articles. Of the 36 studies that were evaluated 20 studies showed significant post-intervention differences of which 18 interventions resulted in a significant increase in medication adherence and two interventions prevented a decline in medication adherence.

Hall et al (2016) conducted a cross-sectional correlational study that was conducted at two federally funded migrant clinics in the southeast United States. The focus of their study was to look at the Social Ecology of Adherence to Hypertension Treatment in Latino Migrant and Seasonal Farmworkers. A nonrandom sample of 45 Latino Migrant Seasonal Farmworkers participated in the study, with a known diagnosis of Hypertension within the last 6 months. The

age range was from 29 to 60 years of age and currently receiving treatment with antihypertensive therapy. The study used existing self-report questionnaires in Spanish, they also had qualified Latino interpreters that were trained by the first author to administer the questionnaires and read the Spanish version to participants. Adherence was measured using the Morisky Medication Adherence Scale, the Blood Pressure Self-Care Scale, and an average of two BP's taken at the time of participation in the study. The Morisky scale scores ranged from 0 to 8, the higher the score the more compliance existed. Blood pressure self-care scale was measured with 10-items, which was the degree to which patients employed certain behaviors to control blood pressure. The random blood pressure controls were measured after 5-minutes of arrival in the right arm first using an electric monitor, a minimum of two readings were taken 1-minute apart.

The results of the study concluded that the patients exhibited low adherence to their medications based off the Morisky Medication Adherence Scale, most reported a moderate level of BP self-care. Majority of the patients were classified as uncontrolled hypertensive, the predominant reason for not taking their blood pressure medicine was because they ran out of it (Hall et al 2016).

Schoenthaler et al (2015) conducted a randomized controlled trial evaluating the effectiveness of culturally tailored practice-based intervention (AI) compared to usual care (UC) on medication adherence among 148 Latino patients with uncontrolled hypertension who are non-adherent to antihypertensive medications, the second aim was to evaluate the effect of the AI versus the UC on blood pressure reduction. The name of this trial is called "Ayudando Latinos Hipertensos Para Mejorar Adherencia a los Medicamentos (ALMA), which translated into "Helping Hypertensive Latinos Adhere to Medications". ALMA is one of the first trials to evaluate the effect of a culturally tailored, practice-based (AI) for Latinos with uncontrolled hypertension. They trained

Medical Assistants who assumed the role of a Health Coach and who are often are the frontline healthcare workers in primary practices, delivering the intervention; therefore, maximizing the likelihood of translating the study into clinical practice.

The patients were randomly assigned equally to either the AI or UC conditions. Patients assigned to the UC (usual care) group received the standard hypertension treatment recommendations as per their primary care provider. The patients assigned to the culturally tailored practice-based intervention (AI) participated in 6-biweekly sessions with bilingual health coaches for the first 3-months and then 3-monthly sessions for the remaining 3-months totaling 9-sessions, each session lasted approximately 15-minutes and it was either done in person or via telephone. Health coaches used a culturally tailored adherence script to identify patient's specific medication adherence barriers and to explore medication adherence facilitators. Depending on the patient's response the Health Coach then engaged in targeted patient-centered counseling to assist patient in developing individualized self-monitoring strategies to overcome these barriers and improve adherence behaviors. Brief motivational interviewing (MINT) strategies were used. MINT is a patient centered counseling approach that encourages patients to express their feelings about and barriers to taking medications, connect their personal values and goals to their health behaviors, enhance their motivation and confidence for change and make a commitment to change.

The study was conducted at a community-based medical clinic that serves predominantly Latino patients in New York City patients were identified via three methods; first by their primary care provider, secondly by their Medical Assistants and thirdly flyers were hung in the clinic waiting room. Patients were compensated with \$5.00 at baseline, \$10.00 at 1-month, \$10.00 at 3-month, and \$10.00 at the completion of the 6-month study. Patients were identified through their EMR using the International Classification of Diseases (ICD-9) with the diagnosis of hypertension

(401-401.9). All patients provided written informed consent to participate, and the study was also approved by the Institutional Review Board of New York University Langone Medical Center. The preliminary results for the primary outcome are the rate of medication adherence at the 6-month study, this was assessed using the electronic monitoring device (EMD). EMD's are designed as pill bottles with an electronic chip on the cap that records a temporal history of date, time and interval between each dosing. Medication adherence was calculated by the following formula (Number of doses removed / Number of doses prescribed X 100). They also used the Morisky Adherence Scale both were found to control blood pressure status by 80% in all controlled cases. The study is still ongoing at this time and there are no final results available.

According to Compton et al. (2010) barriers to medication adherence consisted more specifically of cost, logistics, and hours of pharmacy operation. Their findings also suggested that the Latino population identifies with similar barriers as the general population. Compton et al. (2010) conducted a pilot study using a convenience sample in which all Spanish-labeled prescriptions that had not been picked up from the pharmacy after a 2-week period were used to identify study subjects. The purpose of the study was to evaluate barriers to medication adherence in the Latino population due to the increase in numbers of Hispanics that are growing widely in the United States and giving providers the tools or techniques needed for better health outcomes. They did not use any Theoretical Framework in their study. The study subjects had to be older than 18 years of age and have functioning telephone numbers; bilingual staff then contacted them. After being contacted by telephone they were administered a questionnaire survey that addressed reasons for failure to pick up a prescription. The survey consisted of a 24-item survey instrument with 3-categories of questions. First category contained patient and prescription information, second addressed reasons for failure to

pick up prescriptions and patient perceptions of medication efficacy and illness. The third category collected information regarding other cultural issues that could impact medication adherence such as acculturation, education and length of time living in the United States. The questionnaire was translated from Spanish to English and vice versa by experienced translators to verify accuracy. Participants were asked open-ended questions in reference to them not picking up their medications along with potential barriers such as cost, transportation and communication. Transportation and language were not barriers to for most responders, work schedules consisted of about 50% of the problem followed by cost, the same percentage of responders felt that taking medication consisted of their health not being “good”.

Latino's were studied using a total of 90 patients who met the inclusion criteria, only 38 ultimately completed the survey. The location of the study took place at a Community Access Pharmacy that participated in the 340-B drug-pricing program through the federal government to be able to purchase medications at a discounted price. The pharmacy was located in Des Moines, Iowa which patients receive their medical care at a free clinic or community health center (Compton et al., 2010). The cohort was recruited in an acceptable manner in which they looked at all Spanish-labeled prescriptions that had not been picked up from the pharmacy after 2-weeks. I do not feel that the cohort was a true representation of the Latino population, being that sometimes if the provider does not write “Spanish” in the prescriptions they will receive the medication written in English therefore Latino patients still receive their medications in a language they do not fully comprehend. Not everyone was included that should have been included being that they only looked at prescriptions that were labeled in Spanish. The researchers used both subjective and objective manners in collecting their information in regards to medication non-adherence. Subjective was used in where they picked out all the prescriptions

that were labeled in Spanish, objective was obtained through asking the patient a set of 3-categories of questions. The results of the study revealed that cost, logistics and pharmacy hours were the major barriers to medication adherence. I do agree that these factors do play a role in the concept of barriers, I do not believe the patients were included in the correct manner therefore the results may have been different had a different method have been used in selecting sample population.

Colby et al (2012) conducted a cross sectional study utilizing retrospective patient data collected as part of the larger prospective and randomized “Diabetes among Latinos Best Practices” (DIALBEST) trial which took place in an inner-city Latino population.

According to Colby et al. (2012) the relationship between patient and healthcare provider contributed to medication adherence in an Urban Latino Community.

Colby et al. (2012) performed a cross-sectional study in an urban setting of Hartford, Connecticut. The study consisted of 211 participants where certain criteria had to be met for them to be included in the study, baseline data was collected between December 2006 and February 2009 participants were included in if they (1) were >21 years or older, (2) were living in Hartford County, Hartford CT, (3) had HbA1C >7 and (4) had no medical conditions that limited their ability to perform physical activity. The purpose of the study was to identify independent predictors of poor medication adherence in an Urban Latino population with healthcare disparities. The study was carried out as a face to-face interview in the comfort of the patient’s home by 3-bicultural bilingual interviewers. The questions looked into socio-demographic and economic factors, and multiple questions in regards to their health status, social

support, food security and bio-cultural factors. They did not evaluate any Theoretical Framework in the study.

The results showed that there were three variables found to be independent predictors of patient medication adherence. The first one was associated with increased support of the patient from their physician or healthcare team. Secondly improved medication adherence was associated with the increased number of medications the patients were taking. Thirdly patients who received federal/state aid decreased medication adherence. Adherent patients reported having a better physician or healthcare team support; more medication teaching was done by the health professional and less difficulty learning about diabetes. They concluded that maybe the reason why their target group had better medication adherence results could have been due to having more access to the health-care system.

The researchers evaluated the Latino population primarily of Puerto Rican decent with HbA1c levels greater than 7, lived in Hartford county and were 21 years of age or older. Participants were recruited through “Amigos de Salud” program at Hartford’s Hospital Brownstone Clinic. Informed consent obtained and interview was done in person. They used the Morisky scale to measure the answers to the questions; a high score (4), medium (3 or 2), low (1 or 0). They also included demographic, socioeconomic and psychosocial factors that are known to affect medication adherence. The results indicated that depending on the support the patient felt they had from their provider predicted how compliant they were going to be with their medications. It also found that medication adherence had a correlation with the number of medications that the patient was taking. The researchers did not evaluate the patient’s beliefs or attitudes towards their medications, out of pocket costs, side effects or complexity of medication regimen.

Robbins et al (2004), conducted a comparative study evaluating the effect of several interventions used to improve medication adherence in a clinical trial involving older women. This study used the PRECEDE model of health promotion which stands for predisposing, reinforcing, and enabling causes in educational diagnosis and evaluation, this model was used to evaluate medication adherence in minority women. They stated that three factors might contribute to inadequate adherence such as patient related, regimen related, and provider related. Patient related factors relate to the knowledge the patient may be lacking in order to fully understand of what he/she needs to do. Discomforting side effects have also been shown to negatively impact medication behavior. Minority older adults frequently have limited access to health care as the result of lower socioeconomic status and the particular effects of poverty and discrimination. Barriers such as transportation, language, lack of culturally competent staff and negative attitudes toward research are also potential obstacles to medication adherence. The study included White, Black and Hispanic women aged older than 65 who were ambulatory, women were excluded if they had any disease or medication that affected bone metabolism, any history of cancer in the past 5 years, chronic liver, renal or thrombotic disease, hip fracture and endometrial thickness of >5 mm at screening. All minority women and the first 60 enrolled white women were from the low-dose estrogen study were invited to participate in the 12-month adherence study. Fifty-seven white, 24 Black, and 28 Hispanic women agreed to participate in the study. Approval was obtained from the Institutional Review Board for informed consent at the 3-month time point of the low-dose estrogen study. All the women received educational instruction and standardized teaching about osteoporosis, estrogen and calcium for 12-months, the White women used pillboxes for the 12-month period, the minority women used pillboxes for 6-months followed by the use of electronic monitoring bottles for 6-months in addition to the

educational intervention. The White women were excluded from using the electronic bottles due to their high compliance with the pillboxes. Medication adherence was evaluated by doing a pill count at all visits, for the women who used electronic pill boxes adherence was evaluated through a computer program. All participants completed a questionnaire regarding their understanding of the study at two separate visits; participants were also contacted monthly by the same nurse to encourage medication adherence and answer questions as deemed necessary.

The results of the study showed that White women had a mean adherence of 95% while minority women had a mean adherence of 80%; adherence was measured through the following formula ($\#$ of pills taken / $\#$ of total doses) X 100. White women were found to be more adherent throughout all points of the study; overall adherence did not improve with White women with the interventions in place. Black women showed a great improvement in their adherence at 9 and 12 months of the study. Hispanic women decreased in adherence at 9 months, but then increased at 12 months compared to baseline. Overall the study showed that adherence improved while using multiple interventions, especially for Hispanic women. It also supports the use of specific strategies, such as standardized educational intervention conducted by nurses and the use of pillboxes to improve medication adherence.

Medication Adherence in Hispanics to Latent Tuberculosis Treatment: A Literature Review; Zuniga (2010), performed a systematic search using PubMed, CINAHL, Health Source: Nursing/Academic Edition, Cochrane Library, and Medline. The terms that were searched were “Tuberculosis,” “LTBI,” “Hispanic,” “Latino,” “adherence,” and “compliance.” Research had to be done in the United States with an adult age range. Both qualitative and quantitative reviews were included along with a mixed-methods study and only one randomized control trial for an intervention to improve adherence with a total of 11 studies to be included for synthesis,

Hispanics only made a small portion of the participants in this study. Adherence was measured in different ways; direct methods were serum levels or clinic appointment. Indirect measurement was done using participants' memory or assumed dose, one researcher used direct observation to measure adherence. The study evaluated five main predictors: side effects, social support, demographics, education and self-report of health, adherence was measured by evaluating if the patient picked up their four-month supply of medication. Quantitative research showed no evidence between gender and medication adherence. Qualitative studies did show a difference between men and women in attitude towards the disease process and healthcare professional, one man stated that he was in control, not his wife or doctor and they could not tell him what to do. Medication used for treatment was isoniazid or rifampin, length of treatment varied between 4, 6, or 9 months; each month adherence decreased. Hispanics had the highest adherence at 4 months with 66% participants being compliant to the regimen. One study evaluated acculturation and did not find a correlation between the two. Financial status played a major role in non-adherence for many of the subjects, along with financial problems transportation played a role in as well.

In conclusion with this study financial status, health literacy and cultural factors were important barriers to medication adherence. Many Hispanics believed that being vaccinated with BCG as a child in their country provided lifetime immunity and therefore could not understand the pathophysiology of the disease process. The findings also indicated that self-report for the medication adherence in Hispanics being treated for LTBI might not be accurate because of false compliance.

Bailey, Barner, Weens, Leckbee, Solis, Montemayor, & Pope (2012), conducted a non-experimental cross sectional study design using an anonymous, self-administered survey for data

collection. The purpose of the study was to evaluate medication adherence in individuals with diabetes, barriers to medication adherence and what factors were related to medication non-adherence. The researchers felt that “Pharmacists are in an optimal position to help patients with medication adherence because they are typically the last health care professional patients encounter prior to receiving their medications.”

The survey was administered to 59 individuals over the age of 18 who used a grocery store chain pharmacy or a community clinic for the underserved located in southern Texas, participants were initially recruited by pharmacy staff to complete a 10 to 15 Minute survey upon either dropping off or picking up a prescription for diabetes medication. If the participant was at the community clinic they were asked while waiting for their appointment if they had a previous diagnosis of diabetes. The study began in December of 2010 and ended in February of 2011 and approved by the University of Texas Institutional Review Board. Adherence was measured using the Morisky Medication Adherence Scale (MMAS) because it is considered a reliable and valid self-report adherence instrument.

The sites were specifically chosen due to its high prevalence of Spanish speaking and underserved patients, it has a Hispanic population of 85% and approximately 25% of the patients participate in the discount rewards program that offers a list of approximately 500 Medication at \$5 for 30-day supply or \$9.99 for a 90-day supply. The survey consisted of 24 items to collect information on the dependent and independent variables; it was available in both English and Spanish. The primary dependent variable (medication adherence) was measured using the Morisky scale. The 8-item MMAS was easy to administer with 7-Yes/No questions and 1-on the 5-point Likert scale response ranging from never to always. The primary independent variables were 1-barriers to medication adherence, 2- Complementary and Alternative Medicine use, 3-

patient perceptions and preferences. The response rate for participants was 39.3% with the majority of patients from the community clinic for the underserved. The results for this study showed that cost and no refills as the primary issues impending adherence to their medication regimen.

CHAPTER 3: METHODOLOGY

The proposed study will consist of an integrative review approach as defined by Whittimore and Kanfl's (2005) in order to synthesize research articles relevant to the topic of discussion. This approach allows for various articles to be evaluated and interpreted for the use in the evaluation of "Barriers to Medication Adherence in the Hispanic Population." A systematic search was done using the Hiebert library at Fresno Pacific University, along with Google scholar, PubMed, Medline and CINAHL. The search terms used were "*Hispanics*," "*Latino*," "*Medications*," "*Barriers*," "*Non-Adherence*," "*Compliant*," and "*Non-Compliant*". Limitations were set to the English language, research conducted only in the United States within the last five years starting from 2013 to Present and an adult age range of 18 and over, both males and females were included, specific criteria was set to only look for articles that were done specifically with Hispanics or Latinos. These broad search terms were used in order to increase discovering the maximum number of articles relevant to the topic. Articles were reviewed initially for possible relevance if relevance was found article was either printed or requested through the Hiebert Library. There was a total of 22 articles resulted, each article was skimmed through to evaluate the possibility of inclusion, only 15 articles were chosen to be evaluated. Being that this is an Integrative review no IRB approval was necessary.

*Refer to Figure 1 for Literature Matrix

Eligibility Criteria

Inclusion and Exclusion criteria were thought off to discriminate between relevant and non-relevant articles for review. English language articles with adult population were taken into account as relevant articles, qualitative, quantitative, systematic reviews, integrative reviews, randomized controlled trials, prospective cohort studies, case-control studies, cross-sectional studies were considered as inclusive. The research was restricted to the last five years, mostly due to the census results of the increasing in the Hispanic population within the last five years in the United States and not much research being available before this time frame on this specific population. Research had to be conducted within the United States, including both immigrant and American born Hispanics, If the study consisted of both Hispanic and non-Hispanic population the article was included only if it included the results specifically for the Hispanic population. The results needed to include the different barriers that Hispanics are faced with in order to maintain medication regimen as prescribed for by their primary care provider.

The Critical Appraisal Skills Programme (CASP) was used to appraise the various research studies. Each study was evaluated and appraised based on the specific criteria that it fell under using the corresponding tool to synthesize the information. The CASP tool consists of 8 different tools available to choose from, only 4 were used to evaluate the research. The four that were utilized were Cohort study, Qualitative study, Randomized Control Trial (RCT) study, and Systematic review study.

CHAPTER 4: RESULTS

There was a total of 15 articles appraised for this study majority of the articles stated that Language barriers play a large role in the problem; Language concordance with the physician was associated with improved medication adherence. Education has a powerful influence on health behaviors and health outcomes, cultural beliefs also affect an individuals' health belief and behavior. Acculturation was also found to be a factor, when individuals move from one culture to another the process of adopting new cultural patterns of the host group occurs which then results in behavioral changes within an ethnic or cultural group and potential modification of central values (Hall et al 2016).

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

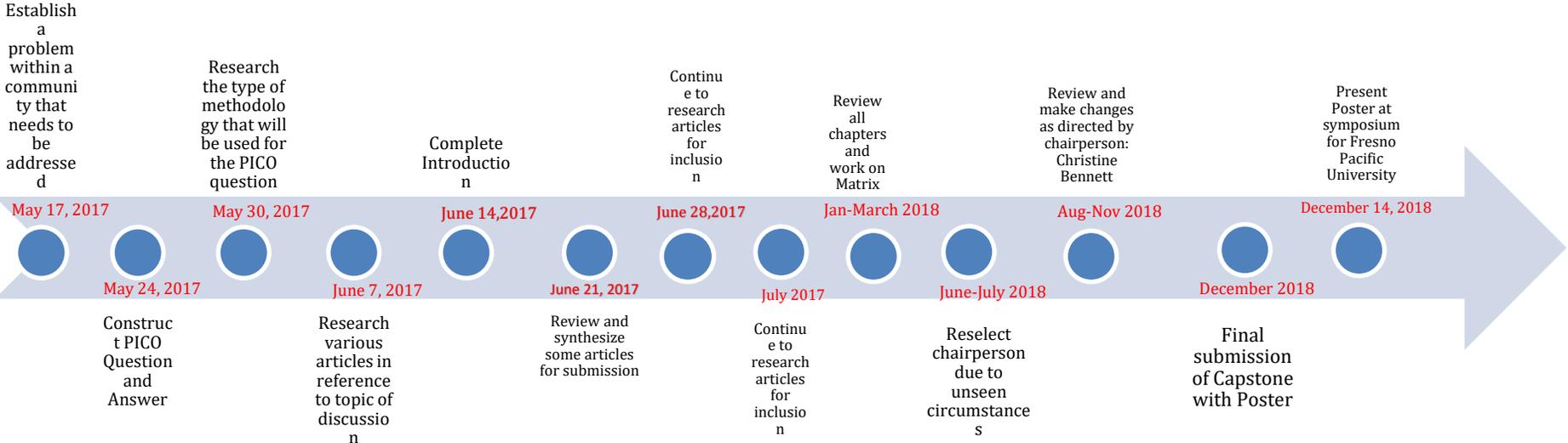
Incorporating global strategies to promote adherence on the part of the practitioner is also of great importance. Patients are more likely to adhere to both medical advice and drug regimens if they trust the healthcare system and feel a special connection with their providers, as well as being able to have an open communication during their visit. One thing that has to either change in order to have better medication compliance within the Hispanic population is to increase the number of providers that are fluent in the language of the patient. Hospitals and clinics have translators available to patients, but as we all know information always gets lost in translation regardless of how much it is attempted to be avoided. Grumback et al (2008) reported that the number of Hispanic health care professionals does not mirror the total percentage of Hispanics in the United States. Hispanic professionals have been historically underrepresented in the health professions: Pharmacist make up 3.4%, physicians 5%, physician assistants 3.7%, licensed registered nurses 1.7% and dentist 3.3%. Spanish speaking providers have been shown to

improve control of chronic diseases and improve patients' adherence to health recommendations and patient satisfaction. The ability to communicate with Latino patients with empathy and sensitivity to cultural differences is an important competency and likely affects medication use. The possibility of providing patients with a bilingual, bicultural health promoter may help bridge the distance between conventional providers and their patients in the future of medicine.

LIMITATIONS

Some limitations that were experienced in this research was that there has not been a lot of research done concentrating on only Hispanics/Latinos. Most of the research that was found and evaluated typically included Hispanics and other minority groups as well. Another factor that was a problem was most of the research conducted was in big inner-city minority/low income clinics which is not necessarily representative of Hispanics/Minorities living in rural areas were one of the biggest challenge most of the time is transportation to and from medical care alone not including taking and picking up their medications from pharmacies. There is only one pharmacy that I know of in Los Banos, that provides delivery services to their patients which is a nice service to have in a Rural community.

TIMELINE



Author, Year & Country Published	Dependent/Independent Variables	Study Design	Sample Size & Characteristics	Methods	Results	Evidence Level (I-VII)
Compton, Haack & Phillips, (2009) United States	N/A	Convenience sample recruited through a Community Access Pharmacy, located in Des Moines, Iowa. The pharmacy provides dispensing and clinical information to patients whom receive free health care at La Clinica de la Esperanza or Primary Health Care, Inc.	n=90 patients met inclusion criteria, only 38 (42.2%) ultimately completed a survey. Spanish speaking patients whom where 18 y.o age, both female and males where recruited for the survey. 45% percent of patients had sixth-grade education or less. High Levels of Acculturation where noted with an average of 12-years or more in the United States.	The manner in which the patients where reached was through finding “Spanish-labeled” prescriptions that had not been picked up from the pharmacy for a 2-week period. Patients where then contacted via phone and where administered a questionnaire survey that addressed reasons for failure to pick up prescriptions. The survey consisted of 24 items, 3-categories of questions.	Data was analyzed using the SPPSS 16. This study found that most of the barriers to medication adherence identified where NOT exclusive to cultural issues. 60% indicated that communication confusion related to prescription filling, logistics, hours of pharmacy operation and cost played a factor on reasons why medication adherence was low.	Level II Decent sample size and randomization. Only concern is how many patients were left out who are Spanish speaking primarily that have their prescriptions filled in English. I feel it was not a true indicator of all the Latin population at this clinic.

Author, Year & Country Published	Dependent/Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
Colby, Wang, Chhabra & Perez-Escamilla (2012)	<p>Independent Variables: *Physician or Healthcare team support *Total number of medications taken per patient.</p> <p>Dependent Variables: *Medication adherence based on support and number of medications taken per patient.</p>	Nested, cross-sectional study utilizing retrospective patient data collected as part of the larger prospective and randomized “Diabetes among Latinos Best Practices (DIALBEST) trial.	<p>Total of 61 patients were included in the study. The mean age of the patients was 58.2, 76% females, 85% of Latinos surveyed were Puerto Rican; 24.6% married; 85% employed, 34.4% use English as their primary language. 11.5% spoke only English at home. 50.8% had less than 8th grade level education. 85.2% had medical insurance. 49.2% had family support, 73.8% had support from their physician or healthcare team.</p> <p>Patients were included if they met the following criteria:</p> <ol style="list-style-type: none"> 1. 21 y.o or older 2. Living in Hartford county, Hartford CT. 3. HbA1C levels >7% 4. NO medical conditions that completely limited 	<p>Participants were recruited from the “Amigos en Salud” program at Hartford Hospital’s Brownstone Clinic. Baseline data was collected between December 2006 and February 2009. Face to face interview was conducted in their homes by 3-bicultural bilingual interviewers. Questions consisted of socio-demographic and economic factors and a series of questions related to their health status, social</p>	<p>16: (26.3%) patients were adherent and 45: (72.8%) were not adherent to medications. Increased medication adherence in the Latino population was associated with increased support of the patient from their physician or healthcare team. Improved medication adherence was also associated with an increased number of medications that the patients were taking. However federal and state benefits was associated with decreased</p>	<p>Level II Good sample size and good independent variables with dependent variables where evaluated. Only limitation was that majority of patients were of Puerto Rican decent and being that they are considered “Americans” they qualify for all benefits and do not face the difficulty of not having accessibility to healthcare.</p>

			their ability to perform physical activity.	support, food security and bio-cultural factors.	medication adherence.	
Author, Year & Country Published	Dependent and Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
Velasco-Mondragon, E., Jimenez, A., Palladino-Davis, A., Davis, D., Escamilla-Cejudo, J. (2016) United States	N/A	Literature Review of Hispanic health in the United States. The question consisted of "What are the current priority issues, needs, and services germane to the health of the Hispanics in the USA?".	Sample Size: N/A Characteristics: Hispanic population of Mexican, Puerto Rican, Salvadorian, Cuban, Dominican, Guatemalan, and other Hispanic origins.	Researchers performed a review of Literature using Arksey and O'Malley's scoping methodology. They searched on PubMed within the last 10 years. They selected a total of 66 citations out of 381 that were specific to the research question. The researchers did NOT complete the 6 th step in the Arksey and O'Malley process of "Consultation.	The researchers found that there were multiple gaps regarding the knowledge needed to improve Hispanic health. Factors that the researchers found to be a problem in Hispanic health were: Limited Cultural sensitivity, health illiteracy and a shortage of Hispanic health care providers. Even for those with access to healthcare services, underutilization of preventative	Level I Very extensive and thorough review of the Hispanic and their health was conducted. The manner and intensity in which it was dissected and interpreted was very detailed and informative to the reader.

					care is still a challenge. Migrant and undocumented workers are disproportionately exposed to health risk factors in the workplace with limited access to health services.	
Gerber, B., Cano, A.I., Caeres, M., Smith, D., Wilken, L., Michaud, J. B., Ruggiero, L. A., Sharp, L. K. (2010)	<p>Independent Variable *Pharmacist and Health promoter</p> <p>Dependent Variable *The goal was to decrease HgbA1C to < 8.0% which patients had to be above the 8.0% to be included in the study</p>	Pilot study that lasted 6-months targeting Latino patients with poorly controlled type 2-diabetes.	Original sample size consisted of 55 patients referred but only 9 completed enrollment. 24 did not attend their clinic appointments, 11 were ineligible, 11 declined or did not complete enrollment procedures.	First, they reconciled medication list with patients. The health promoter identified the following areas for intervention: (1) cost-related barriers, including cost of medication, resulting in sharing of medication with family members; (2) regimen barriers, including complex therapy	In all 9 patients there was a decrease in HgbA1C level that they initially started the study with. It was a collaborative team effort on part of the pharmacist, health promoter and physician caring for the patients.	<p>Level VI Majority of the work was mostly done by the Health Promoter who then reported the information to the Pharmacist and Physician. Even though they did show improvement in HgbA1C levels in all 9 patients, I feel that their sample was too small to</p>

				and pill size; (3) psychosocial barriers, including depression symptoms, (4) access barriers including language barriers with providers. Subsequently the health promoter discussed the information with the pharmacist and the pharmacist then contacted the physician and adjusted medication as necessary specific to each patient.		categorize the entire population of Hispanic/Latino patients.
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Author, Year & Country Published	Dependent and Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
Zuniga, J. A. (2012) United States	N/A	The study design for this study consisted of a systematic research. Evaluating medication adherence in Hispanic or Latino patients diagnosed with Latent Tuberculosis.	Sample Size: N/A Characteristics: Hispanics or Latinos, with Tuberculosis and Medication Adherence was needed in order for it to be included in the review of literature.	Electronic research conducted on a total of 12 articles. 5 were originally sectioned out of 25 results, 4-articles through ancestry search, 3-additional articles where included by the recommendation of an expert in the field. Medication adherence was measured through direct observation. Indirect methods that where most often used were self-reporting, keeping appointments, responding to phone calls, and	The findings of the study found that medication adherence may NOT be accurate due to self-reporting of medication which could have been due to false reporting. Many Hispanics also believed that the BCG vaccine they received as children provided lifetime protection against TB. Financial status was a common theme in medication non-adherence. Poor health literacy was also seen as a	Level V The research was conducted from a systematic review of descriptive and qualitative cases. The number of articles that were reviewed was small in number and that could have been due to the lack of research available on this specific population and disease within the last 10 years.

				dispensing medications.	barrier. Cultural factors where important barrier to medication adherence. They also found a positive correlation between being bi-cultural and adherence to medication. Side effects also were a barrier. The review also found that interventions must be tailored to fit the needs of each community.	
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Author, Year & Country Published	Dependent and Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
Robbins, B., Rausch, K. J., Garcia, R. I., Prestwood, K. M. (2004) United States	<p>Dependent: Medication Adherence</p> <p>Independent: Race/Ethnicity</p>	The purpose of this study was to evaluate the effect of several interventions in order to improve medication adherence using a clinical trial.	<p>N:109 women 57: White women 24-Black 28-Hispanic</p> <p>All the women had to have a diagnosis of osteoporosis and on low-dose estrogen therapy.</p> <p>Baseline characteristics of three racial and ethnic groups were examined using chi-square analysis</p>	All the women were provided with education on Osteoporosis, Estrogen and Calcium consistently for 12-months. Each woman was given pillboxes to use for the 12-month period. Minority women were given Electronic monitoring bottles for 6-months due to their non-adherence. Medication adherence was evaluated by pill counts at all visits. Monthly phone calls were carried out by the same nurse to	<p>5-White women dropped out 5-Black women dropped out 3-Hispanic women dropped out.</p> <p>Medication adherence was greater with White women.</p> <p>Black women showed significant improvement in adherence at 9 & 12 months.</p> <p>Hispanic women had significant adherence at 12 months.</p> <p>Multiple behavioral strategies, frequent contact</p>	<p>Level III</p> <p>The purpose of this research study was to evaluate the Multicultural effects on Medication Adherence. Decent sample size, only downfall that I would say is that if it was truly a Multicultural study the number of White women participants was much higher than the minorities. My opinion is that in order for it to truly be considered Multicultural the number of participants</p>

				<p>reinforce medication adherence. Participants were also required to complete a questionnaire at visit 1&5 to determine their understanding of the research study, reasons for participation and the advantages and disadvantages of participating. Face-to-Face interview was conducted with all Hispanic women.</p>	<p>with a healthcare provider, incentives and physiological improvement likely contribute to adherence rates.</p> <p>The use of electronic monitors had a positive effect on adherence for minority women.</p> <p>Improvement in medication adherence rates in the minority women in this study supports the use of a specific strategy early in the study.</p>	<p>should all be equivalent to each other and not disproportionately different by race.</p>
<p>Bailey, G. R., Barner, J. C., Weens, J. K., Leckbee, G., Solis, R.,</p>	<p>Independent Variable *Barriers to medication</p>	<p>This study was conducted as a non-experimental</p>	<p>N=59 Participants 57% Male 85% Hispanic</p>	<p>Study setting took place in a southern Texas regional grocery</p>	<p>There was a 39.3% response rate to the survey with</p>	<p>Level IV This was a cross-sectional study</p>

<p>Montemayor, D., Pope, N. D. (2012) United States</p>	<p>adherence, use of herbal remedies and spiritual healers and patient perception and preferences.</p> <p>Dependent Variable *Medication Adherence</p>	<p>cross-sectional study using an anonymous self-administered survey for data collection.</p>	<p>Over 50% had hypertension or dyslipidemia and were taking 3 or more medications.</p>	<p>store chain pharmacy and a community clinic for the underserved. This location was selected because it participated in a discount rewards program \$5.00 for a 30-day supply, \$9.99 for 90-day supply which was indicative of an underserved population. The method on how the information was obtained was through a self-administered anonymous survey.</p>	<p>majority of the participants (72%) recruited from the community clinic for the underserved. There was no difference in values between the two sites. In reference to adherence it was found that over on-half 56% of respondents were non-adherent. The second objective which was barriers to medication adherence it was found that cost was the most prevalent reason (22%) followed by no refills (20.3%).</p>	<p>that was carried out at 2-different sites that the researchers felt were “designated” underserved areas due to the discount program offered by the local pharmacy. I think that this study was not very indicative of the Hispanic population per say, part of the inclusion criteria did not consist of thoroughly weeding out non-Hispanic patients therefore not being a true representation of Hispanics in general.</p>
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Author, Year & Country Published	Dependent and Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
<p>Schoenthaler, A., De La Calle, F., Barrios-Barrios, M., Garcia, A., Pitaro, M., Lum, A., Rosal, M. (2015) United States</p>	<p>Independent Variables *culturally tailored practice-based intervention</p> <p>Dependent Variables *Medication adherence in Hypertensive Latino patients</p>	<p>This study was a randomized controlled design to evaluate the effectiveness of a culturally tailored practice-based intervention compared to usual care on medication adherence. The study was conducted at a community based medical clinic in New York City that predominantly serves Latino patients.</p>	<p>N=148 Latino patients with uncontrolled hypertension who are non-compliant to hypertensive medication regimen. 54 patients were randomly assigned to culturally tailored practice-based intervention 52 patients were assigned to the usual care treatment of hypertension</p>	<p>Patients that were assigned to the culturally tailored practice intervention worked with Health coaches who happen to be Medical Assistants that were trained to become Health Coaches specific to the study. They met with the Health coaches bi-weekly for the first 3-months, then monthly for the following 3-months for a total of 9 sessions, each</p>	<p>The results of this study are still pending, this trial study began on October 2012 and recruitment is still in process.</p>	<p>LEVEL II Being that this study is still in process it is difficult to assess whether the controlled group had a better adherence rate than the usual care population of patients with uncontrolled hypertension.</p>

				<p>counseling session lasted approximately 15 minutes either through the phone or in person. During the meetings the health coaches identified what barriers were preventing the patients from being adherent to their medication regimen, afterwards then engaged in a targeted patient-centered counseling to assist patients in developing individualized self-monitoring strategies to overcome their barriers and improve adherence. They used the MINT strategy for</p>		
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				counseling of patients.		
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Author, Year & Country Published	Dependent and Independent Variables	Study Design	Sample size and Characteristics	Methods	Results	Evidence Level (I-VII)
Hall, E., Lee, S. Y., Clark, P., Perilla, J. (2016)	<p>Dependent Variables *Various questionnaires' to assess adherence</p> <p>Independent Variables *Medication Adherence within Latino Migrant and Seasonal Farmworkers.</p>	A cross-sectional study was conducted by trained interviewers for data collection.	N=45 non-random sample of Latino Migrant and Seasonal Farmworkers. Inclusion criteria consisted of Latino/Hispanic descent with a known diagnosis of Hypertension within the last 6-months based of the JNC-7 guidelines, between the ages of 20 to 60 and currently receiving treatment with antihypertensive therapy.	They used the following questionnaires' to be answered: Morisky medication Adherence Scale, Blood Pressure Self-Care Scale, BP Control, Blood Pressure knowledge Scale, Perceived Stress Scale, Acculturation Rating Scale for Mexican-Americans-II, Short assessment of Health Literacy for	The participants exhibited low adherence to their medications based off the Morisky Adherence Scale (51%). Some reported a moderate level of BP self-care. Majority of participants were classified as uncontrolled hypertensive (82%). 80% of participants reported only taking 1-antihypertensive medication, however almost half reported that they did not take	<p>LEVEL IV</p> <p>This study had Somewhat of a small sample size, Various different assessment questionnaires' were used to evaluate the efficacy of medication adherence. The only thing that stands out is I wonder how honest they were in answering the questions, being that some reported taking an antihypertensive medicine but</p>

				Spanish Speaking Adults, Health Care access.	antihypertensive medication on the day of data collection (42%). The predominant reason for not taking their blood pressure medication was because they ran out (47%).	interestingly enough not on the day of study.
White, N. D. (2014)	N/A	This was a Journal Review that explored medication non-adherence in the Latino Population, Language Barriers and Considerations.	They examined how language barriers affected medication adherence with Latinos. They felt that lack of language concordance between physician and patient is associated with a higher likelihood of miscommunication and shorter less patient centered office visits. Spanish speaking patients with poor English skills are less likely to	Systematic review was performed, researching various studies on language and medication adherence.	Results consisted with them finding that Language barriers play a large role in the problem of medication adherence within Latinos. They found that patients were more likely to adhere to both medical advice and drug regimens if they trusted the health care system, feel as if though there is an affiliation with their providers and are capable of having an open and effective	LEVEL VII This journal article made some very interesting and true statements to the reasons why adherence is low within the Latino population. The only thing that I can think of that could have been done different is to specify how exactly their research was obtained and how broad of search topic they used.

			receive medication side effect information from their physicians and are more likely to have adverse reactions to medications because they do not understand the instructions for medication use.		communication with their providers. They also found that language barriers encountered at the pharmacy can also affect medication adherence rates in Latino population.	
Hu, D., Juarez, D. T., Yeborah, M., Castillo, T. (2010) United States	N/A	This study was a Literature review researching what interventions could increase medication adherence in African-American and Latino populations.	The research was conducted from January 2000 to August 2012. The total number of articles reviewed were 36.	A Literature review was conducted, using the following databases: PubMed/Medline, Web of Science and The Cochrane Library. Search terms used included: medication, adherence, medication adherence, compliance, persistence, race, ethnicity, ethnic groups, minority,	20 of the studies showed significant post-intervention differences, of which 18 interventions resulted in a significant increase in medication adherence and two interventions prevented a decline in medication adherence. 24 studies were randomized controlled trials, 8-used a quasi-experimental design. 3-pre-	LEVEL V The researchers conducted a very thorough research of the topic at hand. Being that it included so many various different types of minority groups it was not necessarily focused on Hispanics alone, which I think the results would be more solid.

				African-American, Hispanic, Latino, Asian, Pacific Islander, and Intervention. The term Latino was used to describe individuals who identified as “Hispanic, Latino, Mexican or Puerto Rican”.	experimental design and one was an observational cohort study.	
Hu, J., Amirehsani, K., Wallace, D.C., Letvak, S. (2013) United States	<p>Independent Variables *Focus groups with open-ended questions exploring perceptions about self-care.</p> <p>Dependent Variables *Increase medication adherence</p>	This was a qualitative study using 5 focus groups that was from 2010-2012. The purpose of this study was to explore perceived barriers among Hispanic immigrants with Diabetes and their family members.	N=73 Hispanic immigrants with type 2-diabetes. 36 were the patients themselves and 37 were the family members of the patients. The participants were recruited from a free clinic in central North Carolina that provides health services to a large population of low-income Hispanic people.	Participants were asked to describe their perceptions of barriers to self-management. They conducted the study through focus groups that consisted of both patients and family members with 7 to 16 persons per group. Open ended questions were used to explore patient’s and family members	Barriers to diabetes self-management identified by participants with diabetes were 3 in major themes suffering from diabetes, difficulties in managing the disease and lack of resource/support. 2-themes emerged pertaining to family members: they can provide the support the patient needs and they lack the knowledge.	<p>LEVEL VI</p> <p>This study was interesting that it examined people’s own perceptions about self-care in reference to type 2 diabetes. Being that it was a qualitative study it did not really address the problem or address solutions to improve medication adherence with type 2 diabetics. Therefore, exploring their feelings does not tell us much</p>

				<p>perceptions of barriers to diabetes self-management. The focus groups were facilitated in Spanish and a bilingual family nurse practitioner as well as a bicultural and bilingual native Spanish interpreter lay worker. Each session lasted approximately 20-30 minutes and after completion they received a \$10.00 Wal-Mart gift card.</p>	<p>Average age of the participant was 50 and for family members/significant others it was 41. Majority female. The mean HgbA1c was 8.11%.</p>	<p>information on how to change the problem at hand.</p>
<p>Caballero, J., Ownby, R. L., Jacobs, R. J., Pandya, N., Hardigan, P.C., Ricabal, L. C. (2018) United States</p>	<p>Independent Variables *Administer either the EXIT 25 or CLOX 1 exam to assess for cognitive impairment</p>	<p>This was a Quantitative study evaluating the use of the EXIT 25 or CLOX 1 test to predict adherence to medication</p>	<p>N=40 Mean age was 74.95 and 73% were Female. Hypertension and Hyperlipidemia were identified in 90% and 40% of the participants.</p>	<p>The primary objective of the study was to determine if patients' performance on the CLOX 1 and EXIT 25 was related to self-</p>	<p>The results consisted of the use of EXIT 25 and CLOX 1 test may be able to predict poor adherence or health outcomes in Hispanics older then 65 years of age</p>	<p>LEVEL IV This was the first study to evaluate whether the use of Executive Control Function test (EXIT 25 or CLOX 1) are effective at predicting</p>

	<p>Dependent Variables *Higher levels of HbA1c</p>	<p>regimen within Hispanics older than 65 years of age with type 2 diabetes.</p>	<p>Research was conducted from July 2011-July 2016. Participants were recruited from the researcher’s outpatient university-based healthcare clinics, community centers and the local community via posted flyers.</p>	<p>reported medication adherence or a marker of glycemic control, the HbA1c level. Second objective was to determine if any demographic factors were related to medication adherence or the same marker of glycemic control.</p>	<p>with type 2 diabetes. CLOX 1 scores correlated with self-reported medication adherence and had the strongest correlation with the VAS scores in the linear regression model.</p>	<p>adherence to medication in Hispanics older than 65 years of age with a diagnosis of type 2 diabetes.</p>
<p>Palacio, A. M., Uribe, C., Hazel-Fernandez, L., Li, H., Tamariz, L. J., Garay, S. D., Carrasquillo, O. (2014) United States</p>	<p>Independent Variables *Either telephone based behavioral intervention versus and educational DVD</p> <p>Dependent</p>	<p>This was a Randomized controlled clinical trial testing the comparative effectiveness of a telephone-based behavioral intervention (MINT) versus</p>	<p>N=452 participants 44% Hispanic and 56% Black. Participants were randomized 227 to MINT and 225 to the DVD. The study took place over 22 states throughout the United States</p>	<p>Data was obtained through a large health benefits carrier, clients were identified who received a coronary stent who belonged to a racial/ethnic minority group. Subject were</p>	<p>The results showed that there was adequate adherence in both groups. 64% in the MINT and 50%in the DVD group.</p>	<p>LEVEL II This was a randomized control study with a very good sample size. The only concern I had was how true was the adherence rate of the participants that were assigned to the DVD, how can they</p>

	<p>Variables *Improving medication adherence to thienopyridines</p>	<p>an educational DVD at improving 12-month adherence to thienopyridines among minority coronary stent patients.</p>	<p>through Humana, Inc. Patients had to be 18 years or older with a medical claim for a drug-eluting stent (DES) or a bare metal stent (BMS) between December 2009 and Oct 2010.</p>	<p>identified through ICD and CPT codes.</p>		<p>truly assess whether the DVD was watched or not and if so, how can they make sure the DVD is what changed their behavior and not another reason.</p>
<p>Palacio, A. M., Vidot, D. C., Tamariz, L. J., Uribe, C., Hazel-Fernandez, L., Li, H., Garay, S. D., Carrasquillo, O. (2017) United States</p>	<p>Independent Variables *Assess for medication adherence at time of stent placement</p> <p>Dependent Variables *How adherent will the patient be to medications after stent placement</p>	<p>This was a retrospective cohort study. They examined the data from previous randomized control trial evaluating a telephone based motivational interview delivered by trained nurses (MINT) or the mailed educational DVD.</p>	<p>N=452 participants. 56% African American 44% Hispanic with a mean age of 69.5. 58% males, above 40% had low literacy level. 46% diabetes, 16% depressive symptoms, 13% with an acute MI.</p>	<p>Participants in the randomized control clinical trial filled out a baseline and final survey at 12 months that collected social determinants of health, self-reported adherence and barrier to adherence.</p>	<p>Results consisted of 57% of the entire sample were adequately adherent to their antiplatelet medication. The prevalence of adequate adherence was statistically higher among those with a domestic partner and those who received the MINT.</p>	<p>LEVEL IV This was a retrospective cohort study on the previous randomized control clinical trial. It was interesting to read the following research that had been continued on the previous study which I felt made very valid points.</p>

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Barriers to Medication Adherence in the Hispanic Population

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Abstract

Medication Adherence is ‘the degree to which the person’s behavior corresponds with the agreed recommendations from a health care provider’ as stated by the World Health Organization, they also outline five interacting dimensions affecting medication non-adherence: social/economic factors, therapy-related factors, patient-related factors, condition-related factors and health system/health care team-related factors. A systematic review was conducted evaluating various different literature found as to why non-adherence rates were so high among Hispanics. One of the key components found was that enhancing cultural sensitivity and health literacy is needed to increase Hispanics’ access to and utilization of health services, moreover for controlling chronic diseases, encouraging healthy lifestyles, obesity prevention, workplace safety and utilization of preventative and screening services (Velasco-Modragon et al 2016).

Methodology

The proposed study will consist of an integrative review approach as defined by Whittemore and Kanfl’s (2005) in order to synthesize research articles relevant to the topic of discussion. This approach allows for various articles to be evaluated and interpreted for the use in the evaluation of “Barriers to Medication Adherence in the Hispanic Population.” A systematic search was done using the Hiebert library at Fresno Pacific University, along with Google scholar, PubMed, Medline and CINAHL. The search terms used were “Hispanics,” “Latino,” “Medications,” “Barriers,” “Non-Adherence,” “Compliant,” and “Non-Compliant”. Limitations were set to the English language, research conducted only in the United States within the last five years starting from 2013 to Present and an adult age range of 18 and over, both males and females were included, specific criteria was set to only look for articles that were done specifically with Hispanics or Latinos. These broad search terms were used in order to increase discovering the maximum number of articles relevant to the topic. Articles were reviewed initially for possible relevance if relevance was found article was either printed or requested through the Hiebert Library. There was a total of 22 articles resulted, each article was skimmed through to evaluate the possibility of inclusion, only 15 articles were chosen to be evaluated.

Being that this is an Integrative review no IRB approval was necessary.

Introduction

Non adherence is a wide spread problem within the generalized population problem, but it is of greater concern within the Hispanic population, which happen to be the majority group in the United States as of July 1, 2016; the United States Census Bureau (2016) estimated that there are 56.6 million Hispanics living within the United States as of July 1, 2015, people of Hispanic origin make up the nation’s largest ethnic or racial minority; they constitute 17.6 percent of the nation’s total population. The projected number of Hispanics for 2060 is 119 million people; California has the largest Hispanic population of any state at 15.47 million people. Healthcare access is still a big problem within the Hispanic population even after the passage of the Affordable Care Act in 2010. There are approximately 21.4% of Hispanics living in poverty as of 2015, with poverty comes lack of access to healthcare. In 2015 there were 16.2% of Hispanics who lacked access to healthcare. Forty seven percent of rural Hispanic babies are born poor, compared to 41 percent of Hispanic babies in urban areas, the tracking of children in the state of California they found that children often have trouble excelling in school because their homes are overcrowded and they have nowhere to do their homework (Wiltz 2015). Very few go on to college very few will escape poverty once they hit adulthood. Poor adherence to prescribed regimens can result in a serious of health consequences; studies have shown that approximately 50% of patients do not take their medication for chronic conditions as prescribed. Nationally non-adherence costs the healthcare system and estimated \$100 to \$289 billion annually (American Pharmacist Association).

As stated by White (2014) “adherence is complex and multifactorial, but non-adherence rates appear to be higher in non-white patients, including the Latino Population.” It is critical to find techniques that work in order to increase compliance to a population that is so fast growing within our state of California alone. Improving adherence will prevent unnecessary emergency room visits, hospitalizations and long-term poor health outcomes and increases in health care cost. Medication non-adherence has been found to be a major problem within the Hispanic population. Various causing factors have been evaluated as to why Hispanics are non-compliant with their medication regimen. Some of the different factors that have been evaluated are cost, acculturation, medication access, healthcare access, pharmacy hours, cultural influences and quality of physician-patient relationships (Compton et al 2010).

Hispanics are the largest ethnic minority group in the United States, they are also disproportionately affected by poor conditions of daily life affected by structural and social factors, i.e.: macroeconomics, cultural values, income, education, occupation, and social support systems including health services Health inequalities specifically to Hispanics are those related to socioeconomic, ethnic, and gender population subgroups. Risk factors for non-communicable diseases along with lack of health care access make Hispanics disproportionately vulnerable to disease and death (Velasco-Mondragon, Jimenez, Palladino-Davis, Davis, Escamilla-Cejudo, 2016). The Center for Disease Control (CDC), 2015 reports that the leading cause of disease among Hispanics is heart disease, cancer, and uncontrolled high blood pressure. Historically it has been found that Hispanics in the United States have less access to health services and they utilize fewer preventative care services than any other ethnic groups (CDC, 2014)

Medication adherence is a major problem within the Hispanic population. Lack of healthcare not only impacts a patient’s health but quality of life as well, it is only one of the many hurdles that Hispanics face when treating acute or chronic health problems. There could be many different reasons on why patients of Hispanic origin do not adhere to the medication regimen as prescribed by their provider. Some of the reasons could be due to cost of medication, patients’ understanding of the pathophysiology of the disease, mechanism of use of medication, side effects of medication some of these variables are not within the control of the provider such as the cost but the other variables are very much under the control of the provider prescribing the medication.

As Colby et al found in their study the relationship between provider and patient are key components to a patient’s medication adherence. Education is key when a provider is prescribing new medications to patient’s, explaining mechanism of action gives the patient full understanding of how the medication functions and what to expect in reference to side effects what is normal and not a normal response to a medication. Fully explaining of how long it will take for the medication to take effect and what to expect from then on will make the patient feel empowered and educated about their disease process therefore making them more compliant in taking their medication.

TABLE 1

PRECEDE MODEL: MINORITIES AND MEDICATION ADHERENCE

Predisposing Factors	Enabling Factors	Reinforcing Factors
Health beliefs Attitudes toward health care and research Self-efficacy	Behavioral Medication-taking skills Pillboxes, MEMS	Health Physiological improvement from medication
Cultural beliefs Familialism Allocentrism	Socioeconomic Transportation	Non-health Free transportation Free food Incentive gifts
Education Health knowledge Medication taking	Communication Language	Peers Bilingual research staff
Health status Physical Mental	Community Senior centers Culturally compatible staff	

MEMS = Medication Electronic Monitoring System

Results

There was a total of 15 articles appraised for this study majority of the articles stated that Language barriers play a large role in the problem; Language concordance with the physician was associated with improved medication adherence. Education has a powerful influence on health behaviors and health outcomes, cultural beliefs also affect an individuals’ health belief and behavior. Acculturation was also found to be a factor, when individuals move from one culture to another the process of adopting new cultural patterns of the host group occurs which then results in behavioral changes within an ethnic or cultural group and potential modification of central values (Hall et al 2016).

Conclusion

Incorporating global strategies to promote adherence on the part of the practitioner is also of great importance. Patients are more likely to adhere to both medical advice and drug regimens if they trust the healthcare system and feel a special connection with their providers, as well as being able to have an open communication during their visit. One thing that has to either change in order to have better medication compliance within the Hispanic population is to increase the number of providers that are fluent in the language of the patient. Hospitals and clinics have translators available to patients, but as we all know information always gets lost in translation regardless of how much it is attempted to be avoided. Grumbach et al (2008) reported that the number of Hispanic health care professionals does not mirror the total percentage of Hispanics in the United States. Hispanic professionals have been historically underrepresented in the health professions: Pharmacist make up 3.4%, physicians 5%, physician assistants 3.7%, licensed registered nurses 1.7% and dentist 3.3%. Spanish speaking providers have been shown to improve control of chronic diseases and improve patients’ adherence to health recommendations and patient satisfaction. The ability to communicate with Latino patients with empathy and sensitivity to cultural differences is an important competency and likely affects medication use. The possibility of providing patients with a bilingual, bicultural health promoter may help bridge the distance between conventional providers and their patients in the future of medicine.

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