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Is There a Relationship Between Limited English Proficiency (LEP), Medication Adherence Behaviors, and Adverse Asthma Outcomes in Hispanic Adults with Moderate to Severe Persistent Asthma?

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CALIFORNIA STATE UNIVERSITY, FRESNO

THE DIVISION OF GRADUATE STUDIES

DISSERTATION/THESIS OFFICE

ABSTRACT

IS THERE A RELATIONSHIP BETWEEN LIMITED ENGLISH PROFICIENCY (LEP), MEDICATION ADHERENCE BEHAVIORS, AND ADVERSE ASTHMA OUTCOMES IN HISPANIC ADULTS WITH MODERATE TO SEVERE PERSISTENT ASTHMA?

The effects of LEP are well documented in the literature. LEP decreases medication adherence, causes ineffective communication between patients and providers, and reduces health outcomes. Asthma is known to be misdiagnosed and under-treated in Hispanic adults. There are discrepancies in the literature about the effects of LEP in Hispanic adults with persistent asthma.

The purpose of this study was to determine if the presence of LEP is associated with medication adherence behaviors and adverse asthma outcomes in Hispanic adults with moderate to severe persistent asthma. Hispanic adults with LEP were assessed for asthma outcomes and medication adherence behaviors.

The results of this study revealed that there is no correlation between the level of English proficiency, asthma outcomes, and medication adherence behaviors in Hispanic adults with LEP. These findings are a fundamental step towards mitigating the current gaps in the literature. With the Hispanic population on the rise, further research is needed to develop effective interventions that will advance the delivery of asthma care and relieve the burdens of asthma management in Hispanic adults struggling with LEP.

KEY WORDS: Asthma, Persistent asthma, California, Tulare County, Kings County, Hispanic, Hispanic adult, LEP, health literacy, Moderate to severe persistent asthma.

Archana Kartik Chandra
April 2019

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by

Archana Kartik Chandra

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fulfillment of the requirements for the degree of

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For the California State University, Northern Consortium
Doctor of Nursing Practice:

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CHAPTER 1: INTRODUCTION

Introduction

The considerable adverse effects of language barriers such as limited English proficiency (LEP), on the quality of health outcomes, have been well documented in the literature (Schwei et al., 2016). Previous research studies have confirmed that the presence of LEP hinders patients' access to healthcare services, leads to misconceptions regarding health and self-management information, affects medication adherence, causes a reduction in the overall quality of care provided by clinicians, and subsequently, affects patient-provider relationship satisfaction (Schwei et al., 2016). The Hispanic population, especially, is widely affected by the presence of LEP. Presently, the Hispanics are believed to be the largest and most rapidly growing minority group in the United States (US), accounting for 54 million individuals and comprising 17% of the country's population (Schembri & Ghaddar, 2017; Sarkar, Asti, Nacion, & Chisolm, 2016). According to the US Census Bureau, in 2010, approximately 37.5% of the population reported Spanish as their primary language; 44% of whom were believed to have some level of LEP (Riera et al., 2015). Spanish-speakers with LEP are more likely to receive suboptimal health care, experience miscommunication, and be subjected to shorter and less patient-centered office visits (White, 2015).

Asthma remains one of the most prevalent chronic diseases in the US. It has been well documented in the literature that the effects of asthma disproportionately influence individuals belonging to ethnic and racial minority groups (McQuaid, 2018). According to Sofianou et al. (2012), asthma symptoms are generally misdiagnosed or under-treated in older adult patients.

Furthermore, the majority of the research and therapy guidelines on asthma thus far have been essentially directed towards the pediatric population, although earlier studies have confirmed that morbidity and mortality levels are significantly higher among older adults with asthma (Sofianou et al., 2012). This has resulted in a conspicuous discrepancy in the data available in the literature regarding the management of asthma within the adult population. Medication non-adherence, a prevalent health issue affecting Hispanics with LEP, has been observed across the life-span of these individuals, and contributes to adverse health outcomes, mainly pertaining to the management of chronic diseases such as asthma (White, 2015; McQuaid & Landier, 2017). The current treatment guidelines on asthma have highlighted the regular use of controller medications as one of the fundamental components associated with improved outcomes in long-term management of persistent asthma (McQuaid, 2018). Studies performed by the National Assessment of Adult Literacy (NAAL) and the Pew Research Center have substantiated that Hispanics have the lowest levels of health literacy when compared to other minority groups in the US. The decreased level of health literacy in this population is associated with erroneous use of medications and decreased medication adherence (Sarkar et al., 2016). Research findings have corroborated that culture may play a crucial role in influencing individual beliefs about medication usage and adherence. Due to cultural differences, Hispanic patients are more likely to have opposing beliefs regarding the regular use of controller medications necessary for the management of persistent asthma (Ahmed & Bates, 2017; McQuaid, 2018).

As the Hispanic population in the US continues to grow, further research is required to mitigate the gaps that currently exist in the literature regarding the management of chronic asthma in Hispanic adults with LEP. The findings from these studies will assist healthcare

providers to understand the dynamic needs of this population and lead the way to providing the high quality and culturally competent care necessary to improve long-term asthma outcomes within the adult Hispanic population. The intent of this study is to determine if there is a relationship between LEP, medication adherence behaviors, and asthma outcomes in Hispanic adults. The study will focus on Hispanic adults aged 18 to 65 years old with moderate to severe persistent asthma living in the Kings and Tulare counties in California.

Background

LEP is defined as “individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English” (Sarkar et al., 2016, p. 609). As reported by the US Census Bureau in 2010, 9% of the population above the age of five years is affected by varying levels of LEP and the number of people with LEP has increased by at least 80% between 1990 and 2010 (Schwei et al., 2016). Encounters between providers and patients who have LEP is fairly common and essentially one in 13 patients in the US is reported to have LEP. Overall, two-thirds of all hospitals and more than 50% of internists reportedly interact with a patient who has LEP at least once a week (Andres, Wynia, Regenstein, & Maul, 2013). Previous literature has linked the presence of a language barrier with adverse effects on health outcomes such as “access to care, health status, use of health services, quality of care, patient-physician communication, satisfaction with care, and patient safety” (Flores, 2014, p. 1261). According to McQuaid (2018), LEP is also associated with socioeconomic disadvantage.

Spanish-speakers with LEP have been found to receive lower quality care than their English proficient counterparts, contributing to disparities in health care outcomes (Lor, Xiong, Schwei, Bowers, & Jacobs, 2016). Out of the 37.6 million Spanish-speakers residing in the US,

at least 47% have reported to not being able to communicate in English “very well” (White, 2015). In Hispanics, LEP has been linked to higher rates of miscommunication, less patient satisfaction due to the inability of clinicians to provide patient-centered care, reduced medication adherence, and increased medication side effects due to the inability of LEP patients to fully understand the proper use of medications (White, 2015). As mandated by Title VI of the Civil Rights Act of 1964, all federally funded programs are required by law to implement meaningful access to care for patients with LEP (Schwei et al., 2016). In 2000, the US Department of Health and Human Services, Office of Minority Health, developed the National Standards for Culturally and Linguistically Appropriate Services in Health and Health Care (CLAS Standards) (The National CLAS Standards, n.d.). The goal of the CLAS Standards is to promote high quality health care and enhance health equity for the increasingly diverse minority groups in the US. The CLAS standards were most recently updated in 2013 and include 15 action steps that work as a framework to assist clinicians and health care organizations in providing the most culturally and linguistically appropriate care to minority patients (The National CLAS Standards, n.d.). Despite the provisions put in place by this law, LEP patients continue to receive poor quality health care. A major factor contributing to this dilemma is that the meaningful access to care privileges for LEP patients have not been extensively advocated within the health care system and many providers continue to lack the knowledge of its effectiveness towards improving health outcomes (Schwei et al., 2016). Furthermore, when caring for patients with LEP, longer office visit times need to be allocated to ensure appropriate translation of health information and to allow for complete understanding of information provided, both by the patient and the provider. This becomes especially challenging for clinics with high patient loads (McQuaid & Landier, 2017).

Research has shown that when compared with English proficient patients, those with LEP are often offered fewer healthcare resources, including interpreter services. Other studies have reported that when professional interpreter services are utilized for LEP patient visits, healthcare providers are often inattentive and not entirely supportive to the needs of their LEP patients (McQuaid & Landier, 2017).

In Hispanic patients with asthma, effective communication between patient and provider has been associated with improvement in the chronic management of asthma symptoms (Carlin, Yee, Fagnano, & Halterman, 2014). LEP has also been linked to reduced medication adherence in this population. Medication adherence plays a crucial role in the effective, long-term management of chronic diseases such as asthma, with a lack of treatment adherence leading to reduced asthma outcomes and unnecessary accumulation of healthcare costs (White, 2015). McQuaid and Landier (2017), defined adherence as the “extent to which a person’s behavior (in terms of taking medications, following diets, or executing other lifestyle changes) coincides with the clinical prescription” (p. 200). The process of successful adherence to medication includes three phases: initiation, implementation and discontinuation. During the initiation phase, the healthcare provider prescribes a medication and provides adequate information regarding the benefits and proper use of the medication to the patient and their family. The implementation phase involves the patient taking the prescribed medication according to the directions provided by their provider. Subsequently, in the discontinuation phase, the patient is expected to complete the prescribed course of medication without stopping prematurely (McQuaid & Landier, 2017). Low levels of health literacy within the Hispanic population have been associated with reduced medication adherence and incorrect use of prescribed medication (Sarkar et al., 2016). The

effects of culture are thought to play a pivotal role in how a Hispanic patient perceives the need to adhere to their medication regimen (McQuaid, 2018). Previous research has revealed that due to differences in sociocultural background, Hispanic patients are more fearful of their healthcare providers, are more hesitant to utilize healthcare services for the management of their asthma, have higher levels of concern regarding the use of their controller medications, and have lower levels of trust in the health care system (Ahmed & Bates, 2017; McQuaid, 2018). A majority of Hispanic patients belong to low-income households, have lower levels of education, lack health insurance, and do not have a stable healthcare provider, and a place to receive routine care (De Jesus & Xiao, 2014). In addition to LEP, these factors hinder their access to health care services for the management of persistent asthma.

Problem Statement

It is widely accepted in the literature that LEP leads to significant reductions in health outcomes. Improvements in patient-provider communication can lead to increased patient satisfaction and better management of chronic illnesses. According to the asthma management guidelines developed by the National Heart, Lung and Blood Institute (NHLBI), the effectiveness of the communication between a patient and their healthcare provider is one of the major factors associated with improved treatment adherence and the chronic management of asthma symptoms (Carlin et al., 2014).

Although LEP is a prevalent healthcare issue affecting the Hispanic population in the US, there remains a continued discrepancy in the data pertaining to its effects on Hispanic adults with moderate to severe persistent asthma. As reported by the US Census Bureau, 44% of Spanish-speakers were found to have some level of LEP in 2010 (Riera et al., 2015). With the continued

growth observed in the Hispanic population, it is imperative that further research be conducted to reduce the current gaps in the literature, and assist clinicians in providing effective, high quality, culturally competent, and satisfactory care that will relieve the current burdens of asthma management faced by this under-studied group (Sofianou et al., 2012).

Purpose

There are discrepancies in the current literature regarding the adverse effects of LEP in Hispanic adults with moderate to severe persistent asthma. With the Hispanic population steadily on the rise, added research is imperatively required to establish effective interventions that will advance the future delivery of asthma care and diminish the barriers imposed by the presence of LEP (Schwei et al., 2016). The intent of this research study, therefore, is to determine if the presence of LEP is associated with medication adherence behaviors and adverse asthma outcomes in Hispanic adults aged 18 to 65 years old with moderate to severe persistent asthma, living in the Tulare and Kings counties of California.

Theoretical model

The Purnell Model for Cultural Competence was developed by Larry Purnell in 1995 (Purnell, 2019). This model will be used as the theoretical and conceptual framework for this project. It will serve as a structural guide during the research study to highlight the influence of the Hispanic culture on adult patients with LEP. This includes the effect of cultural beliefs on patients' perception of asthma, adherence to asthma medications, and their level of satisfaction with asthma outcomes. For the past 20 years, the Purnell model has been used extensively in both the healthcare and various other professional settings to promote culturally competent and culturally congruent care. While proving its effectiveness as a guide to promote cultural

competence, the Purnell model has also proved useful in other analogous areas of healthcare such as language interpretation and documentation translation (Butts & Rich, 2018; Purnell, 2019). Within the model, there are 12 different domains that form the organizing framework (Purnell, 2019). The Communication domain, especially, relates to the concepts of “dominant language, health literacy, paralanguage variations, and use of nonverbal communications” (Butts & Rich, 2018, p. 580). In addition to its usefulness in providing culturally competent care to Hispanic patients with LEP, the assumptions of the Purnell model closely align with the intention of this study. These assumptions, specifically, include:

- (a) if patients are coparticipants in their care and have a choice in health- related goals, plans, and interventions, their compliance and health outcomes will be improved; (b) culture has a powerful influence on one’s interpretation of and responses to health care;
- (c) caregivers who assess, plan, intervene, and evaluate in a culturally competent manner will improve the care of patients for whom they care; and (d) to be effective, health care must reflect the unique understanding of the values, beliefs, attitudes, lifeways, and worldviews of diverse populations and individual acculturation patterns. (Purnell, 2019, p. 98-100)

CHAPTER 2: LITERATURE REVIEW

Review of the Literature

An extensive review of literature was conducted on the adverse effects of LEP on asthma outcomes and medication adherence in adult Hispanics of the Kings and Tulare counties in California. The California State University, Fresno's online research database [Henry Madden Library] was used to conduct an online search for related research articles. A combination of key words and phrases used to search for relevant articles included: asthma; California; Tulare county; Kings county; Hispanic; Hispanic adult; limited English proficiency; LEP; health literacy; persistent asthma; and moderate and severe persistent asthma.

1. Apter et al. (2013) conducted a study to assess the relationship between health literacy and subsequent asthma self-management, as measured by adherence to inhaled corticosteroids (ICS) and asthma outcomes. This study was designed as a prospective longitudinal cohort study within a large randomized controlled trial. It consisted of 284 adults, aged 34-62 years old, with moderate or severe persistent asthma who either spoke English or Spanish as their primary language. The participants were recruited from practices located in low-income, inner city neighborhoods throughout Pennsylvania and Philadelphia, with a high prevalence of asthma morbidity. An initial study was conducted to compare individual problem-solving strategies to standard asthma education. Subsequently, in a 26-week trial, data was collected to electronically monitor adherence and asthma clinical outcomes, including variables for asthma control, asthma related quality of life, and Forced Expiratory Volume in one second [FEV1] (Apter et al., 2013). There was no difference in outcome noted within the randomized groups. Six months later, a

secondary assessment was performed using the randomized assignment of literacy questionnaires. These results were used to analyze the relationship between adherence and asthma outcomes. Health literacy was measured by the means of an asthma-related numeracy and reading comprehension, or by using print literacy. An evaluation was then conducted to explore whether participants would benefit from the individual problem solving strategy intervention by literacy level, and whether the negative association between low literacy levels and adherence and asthma outcomes would become reduced through the use of individual problem solving strategies. Findings from this study concluded that interventions aimed to address the literacy needs of patients may improve asthma outcomes. Furthermore, in order to achieve better asthma outcomes, healthcare providers were recommended to consider the health literacy level of their patients. The longitudinal design of this study added to its overall strength while the five month duration of the study proved to be a limitation (Apter et al., 2013).

2. Riera et al. (2014) conducted a qualitative study to explore how asthma health communication and asthma action plan delivery are perceived and experienced by LEP caregivers. The study consisted of 20 Latino asthma health caregivers with LEP who provided regular asthma care to children 2-12 years old in New Haven, Connecticut. While all the participants had similar demographic characteristics, individuals both with and without an asthma action plan were included in the study. Data was gathered over a period of eight months using qualitative, semi-structured, one-to-one, and in-depth interviews in Spanish. The data was then systematically analyzed using the constant comparative method. Data triangulation was subsequently performed via a qualitative focus discussion group. A grounded theory approach was used to code and analyze the data (Riera et al., 2014). The findings of the study concluded

that Hispanic LEP caregivers encountered significant burdens associated with their children's asthma management, and experienced frequent ineffective communication with their healthcare providers. The researchers recommended effective communication, empathetic communication strategies, comprehensive action plans, and improvement in the availability of educational opportunities for Hispanic patients with LEP as possible solutions. The inclusion of various ethnic sub-groups from both ambulatory and acute care settings was the key strength of this study while adoption of a community-based approach limited its generalizability to similar populations from different geographical locations (Riera et al., 2014).

3. Carlin et al. (2014) conducted a research study to assess the influence of Hispanic ethnicity on parent-provider communication, and the level of caregiver confidence in communicating with their child's healthcare provider during an office visit. The data for this research was obtained from a larger study, The Prompting Asthma Intervention in Rochester-Uniting Parents and Providers (PAIR-UP) RTC in Rochester, New York. One hundred and sixty-six caregivers of children aged 2-12 years old with persistent or poorly controlled asthma were recruited to complete surveys in 12 urban primary care offices. Hispanic ethnicity was determined through self-report by asking the caregivers whether they considered themselves to be Spanish, Hispanic, or Latino. Data was collected both in English and Spanish, initially at the office visit and then two weeks later over the phone. During the phone survey, each caregiver was asked to provide their perception of their communication with the provider, their degree of satisfaction, and their overall confidence in their ability to communicate with the healthcare provider. Findings from the study showed that overall, most caregivers found their interaction with their providers to be a positive experience. It was concluded that Hispanic caregivers may

experience better parent-provider communication than non-Hispanic caregivers. The major strength of this study was the ability of the researchers to obtain the parents' perception of their communication with the provider within a two week period, as this reduced the possibility of a recall bias. The major weakness of the study was its small sample size which may have limited the power to detect a difference in overall data (Carlin et al., 2014).

4. Sarkar et al. (2016) sought to determine how health care outcomes were affected by varying levels of health literacy and English proficiency present among Hispanic subgroups. The study was conducted over a two-month period and consisted of 4,013 nationally recruited participants aged 18 years and older. During a phone interview, conducted in either English or Spanish, each participant self-reported their level of health literacy via a three-item health literacy assessment. The score of this assessment was used to categorize each participant as having either "adequate" or "inadequate" health literacy (Sarkar et al., 2016). The language proficiency of the participants was assessed using the Pew Hispanic Healthcare report and their responses were coded as Spanish speaker, Spanish reader, English speaker, and English reader, respectively. Acculturation of the participants was measured using the Pew Hispanic Healthcare Survey. Additional information obtained included health outcomes, demographic variables, and comorbidity status of the participants. Despite the presence of LEP, a positive correlation was noted between health literacy and healthcare outcomes of bilingual and Spanish dominant speakers. The study findings revealed that elevated levels of inadequate health literacy exists within all Hispanic subgroups (English-dominant, bilingual, and LEP). Additionally, across all English proficiency levels, individuals with higher levels of health literacy were more likely to report increased levels of healthcare satisfaction when compared to those with lower levels of

health literacy. This study concluded that Hispanic patients with higher levels of health literacy were less likely to utilize traditional methods of health care treatment when compared to Hispanics with lower levels of health literacy. Due to the large number of nationally recruited participants, the findings of this study could be generalized to the Hispanic population across the US. The assessment of health literacy via participant self-report was noted as one of the limitations of this study (Sarkar et al., 2016).

5. Soones et al. (2016) sought to “describe the causal pathway linking health literacy to medication adherence by modeling asthma illness and medication beliefs as mediators” (p. 804). The data for this research was adopted from the Asthma Beliefs and Literacy in the Elderly study. The study consisted of 433 participants, aged 60 years and older, who were either English or Spanish speaking, and had moderate to severe persistent asthma. The participants were recruited from the hospital and community-based primary and pulmonary care clinics in New York and Chicago from December 2009 to May 2012. In-person interviews were conducted in either English or Spanish to obtain information regarding the socioeconomic characteristics of each participant. Health literacy was assessed using the Short Test of Function Health Literacy in Adults (S-TOFHLA) and scores were categorized as having either adequate or limited health literacy. Participants’ beliefs regarding asthma and medications were assessed with the Belief Illness Perceptions Questionnaire (B-IPQ). Cognitive function in older participants was assessed using tests from the Alzheimer’s Disease Centers’ Uniform Data Set. Medication adherence in participants was measured using the Medication Adherence Rating Scale (MARS) (Soones et al., 2016). The findings of this study concluded that the correlation between limited health literacy and low adherence to asthma controller medication was partially associated with beliefs about

medications. The researchers recommended that improved asthma outcomes could be achieved if healthcare providers paid attention to patients' concerns regarding medication beliefs and used simplified language when caring for patients with low health literacy levels and cognitive impairment. The key strength of this study was the use of a the structural equation model to determine the relationship between health literacy, illness, and medication beliefs, and cognitive function and medication adherence. The findings of this study were limited by its lack of generalizability to younger individuals with moderate to severe persistent asthma, and by the exclusion of individuals living in rural areas (Soones et al., 2016).

6. In light of the rapidly increasing Latino population in the US, Bohm and Cupertino (2014) conducted a study of rural hospitals to determine the language accommodation methods utilized by these hospitals when providing care for their patients. According to Title VI of the Civil Rights Act of 1964 and the CLAS Standards, the provision of language access services for patients with LEP is federally mandated. Rural hospitals, due to their lack of resources, are mostly challenged when having to provide language translation services for their Spanish-speaking patients (Bohm & Cupertino, 2014). A ten-item survey was constructed by the researchers and mailed out to 153 rural hospitals in Kansas and Missouri. The survey included information regarding the monthly volume of LEP Spanish-speakers at each hospital. These hospitals were inquired about their use of translated documents such as “advertisement of language services, educational material, consent forms, complaint forms, preparation information for procedures and diagnostic tests, and discharge instructions” (Bohm & Cupertino, 2014, p. 1278). Each hospital was asked about their interpretation methods including “bilingual family members, clinical bilingual staff, non-clinical bilingual staff, staff interpreters, contract

interpreters, telephonic interpreters, or volunteer interpreters” (Bohm & Cupertino, 2014, p. 1278). The participants were asked to rate their hospital on a 1-10 scale based upon how well they believed care was being provided to the Spanish-speaking patients. The remainder of the survey consisted of open-ended questions about any contemporary strategies or obstacles faced by each hospital in their care of LEP patients (Bohm & Cupertino, 2014). Results of the survey indicated that most rural hospitals treated approximately 0-5 LEP patients each month. Nearly 71% of the hospitals surveyed used at least one type of translated document, although the hospitals that reported a higher volume of LEP patients were not equipped with forms in Spanish for preparation procedures and diagnostic tests, discharge instructions, and patient consent. According to reports, telephonic interpretation, usage of bilingual family members, and usage of bilingual hospital employees were the three major types of interpretation techniques used by hospitals, in descending order. The hospitals that treated an extensive number of LEP patients generally rated themselves higher on the rating scale. Some examples of barriers reported included a small Latino population, lack of financial resources and availability of bilingual employees, difficulty providing interpretation services outside business hours, and lack of understanding of the Latino culture, etc. (Bohm & Cupertino, 2014). The limitations of this study included a small sample size and self-reported measures to obtain participant information. Based on the findings, it was concluded that although rural hospitals are modifying their treatment strategies to accommodate Hispanic patients with LEP, their care provisions remain suboptimal and continued improvement is necessary to fully comply with the CLAS standards. Furthermore, hospitals are encouraged to discontinue their use of bilingual family members as interpreters,

since the likelihood of untrained interpreters to leave out important information or misinterpret information has been made evident in the literature (Bohm & Cupertino, 2014).

7. Although previous literature supports the fact that patient-provider communication is associated with improved adherence to asthma medications, the definitive understanding of this communication pathway remains unclear. Young et al. (2016) conducted a cross-sectional survey study to determine the nuances of the communication pathway that lead to enhancement in patients' use of their asthma medications. The survey was designed categorically to assess "patient-provider communication, proximal outcomes, medication adherence, and demographic characteristics" (Young et al., 2016, p. 697). The participants of the study (n = 452) were recruited through an online survey delivery and participant recruitment service. The participants were permitted eligibility to complete the survey if they reported to be more than 18 years old, were clinically diagnosed with asthma, and were prescribed a preventative or rescue medication for asthma within the past year. The findings of the study concluded that while there was a positive and direct link between patient-provider communication and "patients' understanding of asthma self-management, agreement with providers, trust, involvement in care, and motivation", there was a positive but indirect link between patient-provider communication and adherence to asthma medication (Young et al., 2016, p. 700). Among the findings of the study, disparities in asthma self-management were noted in patients from different racial/ethnic groups and educational levels. The Hispanic/Latino patients, mainly, were found to have decreased levels of asthma self-management knowledge when compared to their Caucasian counterparts. Furthermore, Hispanic patients with a high school diploma were found to be less knowledgeable than those with a college degree. The effects of race/ethnicity and educational level on the self-

management of asthma were found to be prominent factors leading to long-term disparities in patients' asthma outcomes. While "written action plans, self-monitoring, and regular medical reviews" (Young et al., 2016, p. 700) were some of the interventions proposed by the researchers to mitigate the effects of racial and educational variations, additional research has been recommended to explore the roles played by culture and primary language spoken by patients from different racial/ethnic and educational backgrounds, and their association with asthma self-management (Young et al., 2016). The major limitations of this study included the use of a cross-sectional study design and a self-reported survey to gather information from participants. In addition, the severity of asthma in each participant was not controlled for and the participants were recruited from an online recruitment service. These factors decreased the generalizability of the study findings by excluding patients who do not have access to the internet (Young et al., 2016).

Gaps in the Literature

After extensive review of the effects of LEP on asthma outcomes and medication adherence in the Hispanic adults of the Kings and Tulare counties, some essential discrepancies were identified in the existing literature. There is limited information available in the current literature pertaining to the effects of LEP in adult Hispanics who have moderate to severe persistent asthma. Although misdiagnosis and under-treatment of asthma is frequently observed in older patients, an exceeding amount of the data available is based either on studies conducted on Hispanic children with asthma, or their caregivers who have LEP (Sofianou et al., 2012). A majority of these studies focus on Hispanics living in larger cities or urban areas. Thus, their findings cannot be generalized to the Hispanic population residing in the rural areas of

California. Considering the rapid increase in the Hispanic population in the US, these discrepancies in the literature require a compelling need for further research to ensure future provision of quality asthma care and improvement in asthma outcomes in this under-studied population. Research studies focusing on adult Hispanics with LEP will also contribute towards educating healthcare providers about the cultural and health care needs of this population, promote medication adherence and self-management of asthma, improve asthma outcomes, and enhance effective patient-provider communication.

CHAPTER 3: METHODOLOGY

Participants and Setting

This study focuses on the adult Hispanic residents of the Kings and Tulare counties in California. The potential participants for this study will be recruited via a convenience sampling method from two Baz Allergy, Asthma & Sinus Center clinics located in Hanford and Visalia. The potential participants will be identified using information obtained from their electronic medical record (EMR). This quantitative pilot study will consist of 50 patients of Hispanic descent, aged 18 to 65 years old, with a clinically confirmed diagnosis of moderate or severe persistent asthma. One group of 25 participants will be proficient in English while the remaining half will have LEP. To be eligible for inclusion in the study, each participant has to be: (a) between the ages of 18 to 65 years old; (b) of Hispanic descent; (c) either English or Spanish speaking, or bilingual; and (d) have a clinically confirmed diagnosis of moderate or severe persistent asthma. Any participant who does not meet this eligibility criteria, has chronic obstructive pulmonary disease (COPD) or other chronic pulmonary disease, or has more than a 10-pack-per-year history of smoking, will be excluded from the study. All participants identified for the study will be established patients of the clinic and therefore, be familiar with the staff, providers, and the clinic procedure protocols. The potential participants will be approached during their office visit and invited to volunteer as participants in the study. Data for this study will be collected over a span of 4 months, from October, 2018 to February, 2019. Prior to data collection, a consent form, which includes the purpose and protocol of the study, will be reviewed in detail with each participant and signed. The English or Spanish version of the consent form will be used based on the participants' language preference (see Appendices A and

B). Any individual incapable of providing an in-person written consent for the study due to unwillingness or health limitations, will be excluded from participating in the study. Two sets of data will be collected from the same participants at three month intervals; the first set from October to November, 2018, and the second set from January to February, 2019. The clinic where each participant will provide their information will depend on where they had established care prior to the study. This location will remain consistent throughout the duration of the study. Information will be gathered in either English or Spanish, based on the participants' language preference. For this study, two trained, bilingual medical assistants from each office will be assigned to assist with language translation and data collection.

Measures

Information regarding English proficiency, health literacy, sociodemographic characteristics, asthma history, and chronic comorbid conditions will be obtained at the initial visit. The level of English proficiency, sociodemographic characteristics, and asthma history will be obtained verbally through self-report. The level of health literacy of each participant will be assessed using the Short Test of Functional Health Literacy in Adults (S-TOFHLA) (Baker, Williams, Parker, Gazmararian, & Nurss, 1999; Wisnivesky et al., 2012) (see Appendices C and D). Assessments for asthma outcome and medication adherence will be completed at the initial visit, and then at a three month interval. Asthma outcome measurements will be assessed with the Asthma Control Questionnaire (ACQ) (Juniper, 2004; Wisnivesky et al., 2012) (see Appendices E and F) and the Asthma Quality of Life Questionnaire (AQLQ) (Juniper, 1991; Wisnivesky et al., 2012) (see Appendices G and H). Medication adherence will be assessed using the Medication Adherence Rating Scale (MARS) (Thompson, n.d.; Apter et al., 2013;

Wisnivesky et al., 2012) (see Appendix I and J). The English or Spanish version of each questionnaire will be used, based on the participants' language preference. For the purpose of this study, the consent form and the MARS questionnaire were translated into Spanish by a certified language translator.

English proficiency

During the initial visit, each participant will be evaluated for their level of English proficiency. Each participant will be asked to verbally categorize their primary language as English, Spanish, or both. The participants who report Spanish as their primary language will then be asked to classify their ability to speak and understand English as very poor, poor, fair, good, very good, or excellent. Participants who rate their ability to speak English as very poor, poor, or fair, will be categorized as having LEP. The remaining participants will be classified as having English proficiency (EP) (Wisnivesky et al., 2012).

Asthma outcomes

The asthma outcomes for participants will be measured twice using an ACQ and an AQLQ. Both of these questionnaires have been previously validated in both English and Spanish (Juniper, O'Byrne, Guyatt, Ferrie, & King, 1999; Juniper, Buist, Cox, Ferrie, & King, 1999; Wisnivesky et al., 2012). The ACQ is a 7-item questionnaire used to measure asthma control. The questionnaire includes questions about the five most important asthma symptoms, the frequency of the albuterol inhaler use, and the FEV₁% predicted value of the spirometry test. The responses gauge the participants' asthma control over the past week. The final score is the mean score of all the responses. A score of 0 is indicative of well-controlled asthma whereas a score of 6 indicates highly uncontrolled asthma. For the purpose of this study, the optimal cut-point will

be 1.50. If a participant's mean score on the questionnaire is ≥ 1.50 , this means that there is an 88% or higher chance that their asthma is not well-controlled (Juniper, 2004). The AQLQ will be used to analyze asthma-related quality of life. The questionnaire has a recall period of two weeks and determines the participants' overall well-being by asking questions about lifestyle issues commonly related to asthma. The questionnaire consists of 32 items grouped into 4 categories: activity limitations, symptoms, emotional function, and environmental stimuli. Each question has a 7-point response scale ranging from 1 (severe impairment) to 7 (no impairment). The final score is the mean score of the 32 responses (Juniper, 2010; Apter et al., 2013; Wisnivesky et al., 2012). For the purpose of this study, a score of 1.0 to 3.0 will be categorized as a severe impairment, a score of 3.1 to 5.0 will be categorized as a moderate impairment, and a score of 5.1 to 7.0 will be categorized as having no impairment on asthma-related quality of life. The spirometry testing will be performed according to the recommendations set forth by the American Thoracic Society (ATS) to assess lung function (ATS, 2017). Indices for FEV₁pre-bronchodilator, FEV₁predicted, and FEV₁%predicted will be recorded for each participant initially, and then at a three month interval, as part of question number seven of the ACQ (Juniper, 2004; Apter et al., 2013; Culver et al., 2017).

Medication adherence

The lack of medication adherence in Hispanic patients with LEP has been associated with impaired asthma outcomes (White, 2015). The MARS will be used to assess for controller medication adherence in participants (Thompson, n.d.). As part of this study, asthma controller medications will consist of inhaled corticosteroids (ICS), long-acting beta agonists (LABA), long-acting muscarinic antagonists (LAMA), and leukotriene receptor modifiers. MARS is a

validated measuring scale consisting of 10 items used to assess for medication adherence. Each of the 10 items will be scored based on a 5-point Likert Scale where higher scores are indicative of better medication adherence (Thompson, Kulkarni, & Sergejew, 2000; Wisnivesky et al., 2012, p. 180). For the purpose of this study, the participants with a total score of ≥ 5 will be categorized as being compliant with medication adherence and those with a score of ≤ 5 will be categorized as being non-compliant.

Covariates

Health literacy

Previous research has confirmed that elevated levels of inadequate health literacy does have an association with adverse asthma outcomes and decreased medication adherence (Apter et al., 2013; Sarkar et al., 2016; Wisnivesky et al., 2012). The S-TOFHLA will be used to measure the level of health literacy in the participants (Nurss, Parker, Williams & Baker, 2001). This tool has been previously validated for use in research and is available in both English and Spanish (Baker et al., 1999). The S-TOFHLA consists of 36-items, with the final score being the total number of items that were answered correctly (Apter et al., 2013; Wisnivesky et al., 2012). For the purpose of this study, the participants with a score of 0 to 16 will be identified as having inadequate functional health literacy. The participants with scores between 17 to 22 will be placed in the marginal functional health literacy category, and those with a score of 23 to 36 will be categorized as having adequate functional health literacy (Nurss et al., 2001).

Alternative variables

The data on alternative variables will be collected via self-report as part of the participants' baseline characteristics at the initial visit. These will include sociodemographic

information (age, sex, annual income, and the level of education), asthma history (the number of years since diagnosis of asthma, history of intubation, current oral steroid dependency, and recent treatment with oral steroids), and other chronic health conditions (allergy, eczema, sinusitis, gastroesophageal reflux disease (GERD), diabetes, hypertension, congestive heart failure (CHF), osteoporosis, and obesity) (Sarkar et al., 2016; Soones et al., 2016; Wisnivesky et al., 2012). The raw data will be coded and categorized prior to statistical analysis. The age of the participants will be categorized in years as: 18-29; 30-39; 40-49; 50-59; and 60-65. The sex of the participants will be categorized as: male; female. The annual income of the participants will be categorized as: $\leq$ \$20,000; \$20,000-\$34,999; \$35,000-\$49,999; \$50,000-\$74,999; \$75,000-\$99,999; and $\geq$ \$100,000. The level of education will be categorized as: $\leq$ high school; high school or equivalent; some college, no degree; associates degree; bachelor's degree; master's degree; and doctoral degree. The number of years since the diagnosis of moderate or severe persistent asthma will be categorized into years as: 0-5; 6-10; and $\geq$ 11 yrs.

Statistical Analysis

The data obtained during this study will be analyzed using the SPSS® Statistics, Version 24.0 software. A descriptive correlational analysis using the chi-square test will be used to interpret the relationship between the categorical variables. A frequency distribution statistics test will be used to identify the occurrence of values within the various test intervals. The aim of the statistical analysis will be to identify if there is a statistically significant correlation between the level of English proficiency, asthma outcome (asthma control and asthma quality of life) and the medication adherence variables. The covariate variables (health literacy, sociodemographic variables, asthma history, and chronic comorbidities) will also be compared

with the level of English proficiency to assess for the existence of a significant correlation between the variables. A statistically significant relationship between the variables will be confirmed based on a p -value of ≤ 0.05 (Knapp, 2017).

CHAPTER 4: RESULTS

Baseline Population Characteristics

From October to November 2018, 37 patients were recruited to participate in the research study from the Baz Allergy, Asthma & Sinus Center clinics located in Hanford and Visalia, California. Twenty-five of the participants were English-proficient, while the remaining 12 had LEP. These participants were identified for the study based on the clinics' EMR database. Participants were approached for consent to participate in the study if they were (a) between the ages of 18 to 65 years old; (b) of Hispanic descent; (c) either spoke English, Spanish, or both; and (d) had a clinically confirmed diagnosis of moderate or severe persistent asthma. While reviewing patients EMR information, the patients who were of non-Hispanic descent, outside 18 to 65 years of age, had COPD or other chronic pulmonary disease, and had more than a 10 pack-per-year history of smoking, were excluded. The SPSS® Statistics, Version 24.0 software was used to conduct statistical analyses on the data collected. The aim of the research study, initially, was to collect two sets of data on the participants, with an interval of three months in between. The data was scheduled to be collected from October to November of 2018 (Round 1) and then from January to February of 2019 (Round 2). Due to unforeseen time constraints, only one set of data, from October to November of 2018, was successfully gathered. The second round of collection was attempted in January of 2019 but not enough data could be compiled to conduct a meaningfully significant statistical analysis.

Table 1 includes the baseline characteristics of all participants enrolled in the study based on their level of English proficiency. The variables for the baseline population characteristics included sociodemographic characteristics (age, gender, annual income, and the highest level of

Table 1

Baseline Characteristics of Participants Associated with English Proficiency

Characteristic	Total (%) (n=37)	EP (%) (n=25)	LEP (%) (n=12)	p-value
Age, years (%)				0.092
18-29	4 (10.8)	4 (16.0)	0 (0.0)	
30-39	9 (24.3)	8 (32.0)	1 (8.3)	
40-49	6 (16.2)	4 (16.0)	2 (16.7)	
50-59	9 (24.3)	5 (20.0)	4 (33.3)	
60-65	9 (24.3)	4 (16.0)	5 (41.7)	
Sex (%)				0.711
Male	12 (32.4)	9 (36.0)	3 (25.0)	
Female	25 (67.6)	16 (64.0)	9 (75.0)	
Annual income (%)				0.013*
≤ \$20,000	19 (55.9)	8 (36.4)	11 (91.7)	
\$20,000-\$34,999	2 (5.9)	2 (9.1)	0 (0.0)	
\$35,000-\$49,999	3 (8.8)	2 (9.1)	1 (8.3)	
\$50,000-\$74,999	7 (20.6)	7 (31.8)	0 (0.0)	
\$75,000-\$99,999	2 (5.9)	2 (9.1)	0 (0.0)	
≥ \$100,000	1 (2.9)	1 (4.5)	0 (0.0)	
Education (%)				0.000*
≤ High school	13 (35.1)	2 (8.0)	11 (91.7)	
High school or equivalent	6 (16.2)	5 (20.0)	1 (8.3)	
Some college, no degree	10 (27.0)	10 (40.0)	0 (0.0)	
Associates degree	3 (8.1)	3 (12.0)	0 (0.0)	
Bachelor's degree	3 (8.1)	3 (12.0)	0 (0.0)	
Master's degree	2 (5.4)	2 (8.0)	0 (0.0)	
Doctoral degree	0 (0.0)	0 (0.0)	0 (0.0)	
Asthma history (%)				
Ever intubated	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Steroid dependent	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Oral steroid treatment within 3 months	6 (16.2)	4 (16.0)	2 (16.7)	1.000
Years with asthma (%):				
0-5 yrs	11 (29.7)	4 (16.0)	7 (58.3)	0.025*
6-10 yrs	9 (24.3)	8 (32.0)	1 (8.3)	
≥ 11yrs	17 (45.9)	13 (52.0)	4 (33.3)	
Self-reported chronic conditions (%)				
Allergy	37 (100.0)	25 (100.0)	12 (100.0)	N/A
Eczema	5 (13.5)	3 (12.0)	2 (16.7)	1.000
Sinusitis	2 (5.4)	2 (8.0)	0 (0.0)	1.000
Gastroesophageal reflux disease (GERD)	13 (35.1)	7 (28.0)	6 (50.0)	0.274
Diabetes	8 (21.6)	3 (12.0)	5 (41.7)	0.083
Hypertension	11 (29.7)	5 (20.0)	6 (50.0)	0.122
Congestive heart failure (CHF)	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Osteoporosis	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Obesity	27 (73.0)	18 (72.0)	9 (75.0)	1.000
Health literacy (%)				0.003*
Inadequate functional health literacy	7 (18.9)	1 (4.0)	6 (50.0)	
Marginal functional health literacy	2 (5.4)	1 (4.0)	1 (8.3)	
Adequate functional health literacy	28 (75.7)	23 (92.0)	5 (41.7)	

Note. EP - English Proficient; LEP - limited English proficiency. n - sample size. * - significant p-value ($p \leq 0.05$).

education), asthma history (history of intubation, current oral steroid dependence, history of oral steroid exposure within the past three months, and the number of years with asthma), and the level of functional health literacy. A frequency distribution statistics test was used to measure the occurrence of the baseline characteristic variables within the overall population, based on the level of English proficiency. The chi-square test was used to determine if a significant correlation existed between the categorical variables of the baseline characteristics and the level of English proficiency. If the test between two variables did not meet the chi-square pre-test criteria ($1 - n \geq 5$ per cell minimum) (Knapp, 2017), the Pearson's chi-square coefficient was not used to determine the significance of the relationship between the variables. In this case, the Fisher's exact test coefficient was used if the 2×2 table criteria was met. If the test failed to meet the criteria for both the chi-square test and the Fisher's exact test, then the likelihood ratio was used to analyze the relationship between the variables (Knapp, 2017).

In the EP group, a majority of the patients were between the ages of 30 to 39 years old (32%) while in the LEP group, most patients were between the ages of 50 to 65 years old (75%). There were more female participants in the study compared to males; 64% of the participants in the EP group and 75% of those in the LEP group were female. There was no significant relationship between the age and gender of the participants and their level of English proficiency (p -value 0.09 and 0.71, respectively). Overall, nearly 56% of the participant population earned $\leq$ \$20,000 per year. Within both the EP and LEP groups, the majority of the participants earned less than \$20,000 annually. For the EP group, the second-highest income range was between \$50,000-\$74,999 while in the LEP group, the second-highest income range was seen in the

\$35,000-\$49,999 range. Three of the 37 participants failed to provide data about their annual income. A significant correlation was seen between the annual income earned and the level of English proficiency (p -value 0.01). A majority of the overall population reported having an education level that was either less than a high school degree or with some college education, but no degree. For the EP group, 40% of the participants had some college education with no degree, while 91.7% of the LEP group had a $\leq$ high school education. A significant relationship was noted between the participants' level of education and English proficiency. None of the participants were steroid dependent or had a history of ever being intubated during an asthma flare. A similar frequency of oral steroid use was observed for both the EP and the LEP groups over a period of three months. Overall, nearly 46% of the participants reported having asthma for ≥ 11 years. While 52% of the participants in the EP group reported having asthma for ≥ 11 years, more than half (58%) of the patients in the LEP group reported a fairly recent diagnosis of asthma (0-5 years). A significant correlation was observed between the years since the diagnosis of asthma and the English proficiency level (p -value 0.03) of the participants. No correlation was noted in the participants' self-reported chronic comorbidities and their level of English proficiency. Overall, 73% of the participants were obese; 72% of the EP group was obese while 75% of the LEP participants had a Body Mass Index (BMI) that fell in the obesity range. A distinct correlation was noted between the level of health literacy and the level of English proficiency (p -value 0.03). Overall, a majority of the patient population had adequate functional health literacy (~76%). Within the EP group, 92% of the patients had adequate functional health literacy while half of the LEP group, had inadequate functional health literacy.

Table 2

Association of Major Covariates with Asthma Outcomes and Medication Adherence

Outcome	AC (%) (n=37)		Mi	QoL (%) (n=37)		MA (%) (n=37)	
	WC	NWC		Mo	Se	C	NC
Annual income (%) *							
≤ \$20,000	8 (42.1)	11 (57.9)	6 (31.6)	9 (47.4)	4 (21.1)	15 (78.9)	4 (21.1)
\$20,000-\$34,999	2 (100.0)	0 (0.00)	0 (0.00)	0 (0.00)	2 (100.0)	2 (100.0)	0 (0.00)
\$35,000-\$49,999	2 (66.7)	1 (33.3)	1 (33.3)	1 (33.3)	1 (33.3)	3 (100.0)	0 (0.00)
\$50,000-\$74,999	5 (71.4)	2 (28.6)	2 (28.6)	1 (14.3)	4 (57.1)	7 (100.0)	0 (0.00)
\$75,000-\$99,999	2 (100.0)	0 (0.00)	0 (0.00)	0 (0.00)	2 (100.0)	1 (50.0)	1 (50.0)
≥ \$100,000	1 (100.0)	0 (0.00)	0 (0.00)	0 (0.00)	1 (100.0)	1 (100.0)	0 (0.00)
<i>p-value</i>	0.156		0.179			0.300	
Education (%)							
≤ High school	6 (46.2)	7 (53.8)	5 (38.5)	5 (38.5)	3 (23.1)	10 (76.9)	3 (23.1)
High school or equivalent	3 (50.0)	3 (50.0)	2 (33.3)	2 (33.3)	2 (33.3)	5 (83.3)	1 (16.7)
Some college, no degree	6 (60.0)	4 (40.0)	2 (20.0)	3 (30.0)	5 (50.0)	9 (90.0)	1 (10.0)
Associates degree	2 (66.7)	1 (33.3)	1 (33.3)	0 (0.00)	2 (66.7)	3 (100.0)	0 (0.00)
Bachelor's degree	2 (66.7)	1 (33.3)	0 (0.00)	2 (66.7)	1 (33.3)	3 (100.0)	0 (0.00)
Master's degree	2 (100.0)	0 (0.00)	0 (0.00)	0 (0.00)	2 (100.0)	1 (50.0)	1 (50.0)
Doctoral degree	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
<i>p-value</i>	0.661		0.361			0.539	
Years with asthma:							
0-5 yrs	7 (63.6)	4 (36.4)	1 (9.10)	3 (27.3)	7 (63.6)	7 (63.6)	4 (36.4)
6-10 yrs	6 (66.7)	3 (33.3)	1 (11.1)	3 (33.3)	5 (55.6)	8 (88.9)	1 (11.1)
≥ 11 yrs	8 (47.1)	9 (52.9)	8 (47.1)	6 (35.3)	3 (17.6)	16 (94.1)	1 (5.90)
<i>p-value</i>	0.541		0.049**			0.106	
Health literacy (%)							
Inadequate FHL	5 (71.4)	2 (28.6)	2 (28.6)	3 (42.9)	2 (28.6)	6 (85.7)	1 (14.3)
Marginal FHL	0 (0.00)	2 (100.0)	1 (50.0)	1 (50.0)	0 (0.00)	1 (50.0)	1 (50.0)
Adequate FHL	16 (57.1)	12 (42.9)	7 (25.0)	8 (28.6)	13 (46.4)	24 (85.7)	4 (14.3)
<i>p-value</i>	0.136		0.558			0.517	

Note. AC - Asthma Control, WC - well controlled, NWC - not well controlled. QoL - Quality of Life, Mi - mild impairment, Mo - moderate impairment, Se - severe impairment. MA - Medication Adherence; C - compliant, NC - non-compliant. n - sample size. FHL - functional health literacy. * - n = 34 (3 participant responses missing for annual income), ** - significant p-value with $p \leq 0.05$.

Covariates

The baseline population characteristic variables, annual income, level of education, the number of years with asthma, and health literacy, were noted to have a significant relationship with the level of English proficiency ($p\text{-value} \leq 0.05$) (Table 1). These were considered to be the

major covariates of the study. Table 2 conveys the association of these covariates with the asthma outcomes (asthma control and asthma quality of life) and medication adherence. These comparisons were conducted to verify if, in addition to having a significant relationship with the participants' level of English proficiency, these baseline characteristics also demonstrated any notable relationship with their asthma outcomes and medication adherence. The chi-square test was used to determine if a significant correlation existed when these covariates were compared with the asthma outcomes and medication adherence variables. As mentioned previously, when the test failed to comply with the criteria for both the chi-square test and the Fisher's exact test, the likelihood ratio was used to interpret the relationship between the variables.

There was no significant correlation noted when the annual income was compared with the participants' asthma control, quality of life, and medication adherence. Similarly, the levels of education and functional health literacy did not demonstrate any significant difference when compared to asthma outcomes and medication adherence. In both these comparisons, the p -value was ≥ 0.05 , which was indicative of no statistically significant difference between the levels of these covariates, asthma outcomes and medication adherence. The number of years each participant had asthma was compared with asthma outcomes and medication adherence. No significant difference was observed between the number of years with asthma when compared to asthma control and medication adherence (p -value ≥ 0.05). A p -value of ≤ 0.05 was noted when the number of years with asthma was compared with the participants' quality of life. A majority of the participants (~46%) reported having asthma for ≥ 11 years. Most of the participants (~41%) reported that asthma severely impaired their quality of life. For the 20 participants who reported having asthma for ≤ 10 years, the majority (60%) felt that their asthma severely

impaired their quality of life. In the remaining 17 participants who reported having asthma for $\geq$ 11 years, the majority (47%) felt that asthma caused a mild impairment to their quality of life.

English Proficiency, Medication Adherence and Asthma Outcomes

The goal of this study was to determine if the presence of LEP affected asthma outcomes (asthma control and quality of life) and medication adherence in Hispanic adults with moderate to severe persistent asthma. The chi-square test was used to determine if asthma outcomes (asthma control and quality of life) and medication adherence had a significant relationship to the level of English proficiency of the participants (Table 3). The likelihood ratio was used to determine the relationship between the variables if the tests failed to satisfy the criteria requirements for both the chi-square and the Fisher's exact tests.

Table 3

Association of English Proficiency with Asthma Outcomes and Medication Adherence

Outcome	EP (%) (n=25)	LEP (%) (n=12)	p-value
Asthma control (%)			1.000
Well-controlled	14 (56.0)	7 (58.3)	
Not well-controlled	11 (44.0)	5 (41.7)	
Quality of life (%)			0.396
Mild impairment	6 (24.0)	4 (33.3)	
Moderate impairment	7 (28.0)	5 (41.7)	
Severe impairment	12 (48.0)	3 (25.0)	
Medication adherence (%)			1.000
Compliant	21 (84.0)	10 (83.3)	
Non-compliant	4 (16.0)	2 (16.7)	

Note. EP - English proficient, LEP - limited English proficiency. n - sample size.

The majority of the participants in both the EP and LEP groups were found to have well controlled asthma and reported adequate compliance with their medications. Forty-eight percent of the participants in the EP group reported a severe impairment to their quality of life due to asthma while only 25% of the LEP group felt this way. In the LEP group, ~42% of the

participants reported moderate impairment and 33% reported a mild impairment to their quality of life due to asthma. The percentages of participants who reported mild and moderate impairments to their quality of life due to asthma were essentially comparable within the EP group. The p -value for the comparisons of asthma control, quality of life, and medication adherence were all ≥ 0.05 . Therefore, it was concluded that there was no statistically significant difference in asthma outcomes and medication adherence behaviors among the participants in this study based on the level of their English proficiency.

CHAPTER 5: DISCUSSION AND CONCLUSION

Discussion

There is considerable data available in the literature linking LEP to reduced health outcomes. These include but are not limited to decreased access to health care resources, misunderstanding of medical information and disease process, poor self-management of chronic illness, medication non-adherence, and subsequent dissatisfaction and mistrust in the health care system (Schwei et al., 2016; Wisnivesky et al., 2012). In the US, the Hispanic population is a predominant subgroup that is largely affected by LEP, leading to suboptimal health outcomes (White, 2015). In Hispanic adults with asthma, the presence of LEP hinders optimal asthma control and the appropriate use of controller medications caused by miscommunication between patients and their clinicians (Wisnivesky et al., 2012). As the Hispanic population continues to grow, there is a compelling need to focus on the existing gaps in the literature and find competent solutions that will promote asthma outcomes and mitigate the health care burden associated with LEP. The intent of this study was to explore if the presence of LEP was associated with adverse asthma outcomes and medication adherence behaviors in Hispanic adults aged 18 to 65 years old residing in the Kings and Tulare counties of California.

Association of LEP with asthma outcomes and medication adherence

Contrary to previous literature, the findings of this study did not indicate a statistically significant difference in asthma outcomes (asthma control, quality of life) and medication adherence in the presence of LEP. Sarkar et al. (2016) reported a significant positive correlation in health outcomes regardless of the presence of LEP. This finding was concluded from a much

larger study consisting of over 4,000 nationally recruited participants from various Hispanic subgroups. In our study, the reports of asthma control were essentially analogous in both the English proficient (EP) and the LEP groups (p -value 1.0). A majority of the participants in the EP group described their asthma as severely impairing their quality of life (48%) while those in the LEP group reported mild to moderate impairment of their quality of life due to asthma (p -value 0.39). Our study was also conducted on a much smaller scale which may have restricted its power to identify a significant discrepancy in the overall participant data. In 2013, Andres et al. reported that insufficient and erroneous communication can lead to severe health implications for LEP patients. Bohm and Cupertino (2014) performed a study to explore the language accommodation approaches practiced by rural hospitals when providing care for patients with LEP. The results of this study concluded that although adjustments are under way to implement higher quality care for LEP patients in rural settings, continued efforts are essential to conform to CLAS standards requirements, and adequately accommodate the increasing healthcare demands of the Hispanic population. The findings of our study, on the contrary, did not exhibit a statistically significant discrepancy in the asthma outcomes and medication adherence patterns of the EP and LEP groups and thus, did not necessitate any further enhancement of the clinics' pre-established language accommodation parameters.

Self-management is a fundamental factor in long term asthma control (Wisnivesky et al., 2012). In LEP patients with asthma, language barriers hinder access to high quality care, reduce effective communication with providers, lessen the capability to adhere to prescribed medication, and discourage the self-management of asthma (Andres et al., 2013; Wisnivesky et al., 2012).

Riera et al. (2014), explored how asthma communication and action plan delivery were perceived and experienced by Hispanic LEP caregivers with asthmatic children. Results of the study confirmed that these caregivers were more inclined to engage in ineffective communication with their healthcare providers and endured considerable burdens related to the long-term asthma management of their children. The study findings revealed a significant relationship between the levels of English proficiency and the functional health literacy of the participants. Previous research has linked both reduced health literacy levels and LEP in Hispanics to suboptimal medication adherence behaviors and inability to adequately self-manage asthma (McQuaid, 2018; White, 2015). Based on previous literature, it might be presumed that the results of this study would demonstrate a direct correlation between medication adherence behaviors and the level of English proficiency but no statistically significant difference was identified. For both the EP and LEP groups, essentially similar percentages of medication compliance were reported (p -value 1.0). Young et al. (2016) conducted a study to investigate the implications of the communication pathway that promoted improvement in patients' use of asthma medication. The study findings confirmed that minority groups such as the Hispanics, who have lower levels of education, were more likely to experience discrepancies in asthma self-management. Consequently, the influence of race/ethnicity and educational level on the self-management of asthma were recognized as key factors leading to longstanding inconsistencies in asthma outcomes. Consistent with the findings of this study, a significant correlation between LEP and the level of education was observed among the Hispanic participants in our study as well, in conjunction with annual income, number of years with asthma, and the level of functional health literacy. The majority of the participants in the LEP group reported having an

educational level of a high school degree or less while 60% of the EP group reported having either a high school degree (or equivalent) or some college education without a degree. Furthermore, a significant relationship was identified between the difference in the number of years with asthma and the asthma quality of life. Most of the participants (~46%) in the study reported having asthma for more than 11 years. A majority of these participants felt that asthma caused a mild impairment to their overall quality of life. Out of the 54% of the participants who reported having asthma for less than 10 years (0-5 years and 6-10 years), 60% felt that their asthma severely impaired their quality of life. When compared with the level of English proficiency, most of the EP participants (52%) reported having asthma for more than 11 years while most of the LEP participants reported having asthma for less than 5 years. Based on these findings, it can be inferred that a majority of the EP participants felt their asthma had a mild impairment on their overall quality of life while the LEP patients reported asthma to impair their lives more severely. Furthermore, as the majority of the LEP patients from our findings reported being clinically diagnosed with asthma fairly recently, some underlying presumptions that could be deduced to corroborate this phenomena were that perhaps these patients: (a) lacked regular access to a primary care provider or clinic where they could receive asthma care; (b) did not have healthcare insurance; (c) were using alternative or traditional methods of asthma treatment; and (d) lacked trust in the healthcare system based on their sociocultural barriers.

Association of LEP with health literacy

Previous research concludes that Hispanics, in general, have lower levels of health literacy compared to any other ethnic minority group (Sarkar et al., 2013). In their study, Wisnivesky et al. (2012) observed that elderly patients and ethnic minorities had higher rates of

low health literacy. Based on their findings, it was concluded that an association between LEP, low health literacy, and asthma outcome could be assumed. The level of functional health literacy was one of the major covariates observed in our study. While 92% of the EP participants were found to have adequate health literacy, half of the LEP participants had inadequate health literacy. Consistent with previous literature, our research findings concluded the existence of a significant difference between the levels of functional health literacy and English proficiency. Similarly, Sarkar et al. (2016) found out that elevated levels of inadequate health literacy existed within all Hispanic subgroups. The relationship between health literacy and health outcomes was not confined to LEP but affected Hispanics with differing levels of English proficiency, even those who reported being bilingual. On the contrary, no statistically significant difference was evident in comparisons between health literacy, asthma outcomes, and medication adherence in our study. From their findings, Apter et al. (2013) confirmed that health literacy was directly associated with asthma outcomes and through interventions aimed at improving the health literacy needs of LEP patients, healthcare providers can promote better asthma outcomes.

Limitations

Our study had some key limitations which may have influenced the final results. The small size of the representative sample ($n = 37$) and the LEP group ($n = 12$) may have reduced the strength to detect a statistically significant difference in the overall data. Due to unanticipated time constraints and other contingencies, a second set of data could not be collected by the researcher as initially planned. The results of the study, therefore, were analyzed based on the preliminary data. A convenience sampling method was utilized to recruit the participants from

the two clinics in the Kings and Tulare counties. Thus, our sample population mainly included Hispanics of Mexican descent while excluding a majority of the other Hispanic subgroups residing in other geographical locations. The participants in our study were all established patients under the care of asthma specialists during the study. Therefore, the findings of this study may not represent Hispanic patients with asthma in alternate healthcare settings that do not specialize in asthma management or patients who do not have regular access to asthma care. In addition, the healthcare providers in the clinics were not screened for their level of cultural competency and no observations were made regarding the effectiveness of the patient-provider communication during the office visits.

Conclusion

The adult Hispanic population in the US is extensively affected by the presence of LEP. The literature has linked LEP in this population with reduced access to healthcare services, misunderstanding of health and self-management information, decreased treatment adherence, ineffective communication with healthcare providers, lower health outcomes, and decline in the overall quality of care. While abundant research and treatment guideline information is available for children with asthma, there are indisputable gaps existing in the literature regarding Hispanic adults with moderate to severe persistent asthma. The purpose of this study was to determine if the presence of LEP is associated with adverse asthma outcomes and medication adherence behaviors in Hispanic adults aged 18 to 65 years old with moderate to severe persistent asthma, residing in the Kings and Tulare counties of California.

Thirty-seven participants were included in the study. Twenty-five of these participants were EP while the remaining 12 had LEP. Data was collected for asthma control, asthma quality

of life, medication adherence, health literacy, sociodemographic characteristics, comorbidities and asthma history. Three key findings were observed in our study: 1) we concluded that contrary to previous literature, there was no statistically significant difference identified between the level of English proficiency, asthma outcomes (asthma control and asthma quality of life) and medication adherence behaviors in our population; 2) consistent with previous literature, a statistically significant correlation was present between the level of English proficiency and the covariate variables: annual income, level of education, number of years with asthma, and the level of functional health literacy; and 3) a statistically significant difference was observed between the number of years with asthma and the asthma quality of life. Participants in the EP group who were diagnosed more than 11 years ago, reported that asthma had a mild impairment on their quality of life. Meanwhile, the LEP participants who had asthma for less than five years, reported that their asthma caused a severe impairment on their quality of life.

Future research

Despite the limitations, the results from this study can be recognized as a fundamental step towards alleviating the gaps that currently exist in the literature regarding the long-term asthma outcomes and the medication adherence behaviors of the Hispanic adults who struggle with LEP. Future research should endeavor to conduct a longitudinal study consisting of a larger representative sample recruited via a probability sampling method to ensure valid and reliable conclusions, and to reduce the possibility of bias. The representative sample should also incorporate various Hispanic subgroups so that the findings from the study can be generalized to a larger population of adult Hispanics with moderate to severe persistent asthma who have LEP. Finally, since cultural beliefs play a crucial role in the self-management of asthma and other

chronic diseases, and the effectiveness of patient-provider communication has shown to improve long-term asthma outcomes, the inclusion of these variables in future research studies needs to be considered by researchers.

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APPENDICES

Appendix A: Consent Form

CALIFORNIA STATE UNIVERSITY, NORTHERN CALIFORNIA CONSORTIUM DOCTOR OF NURSING PRACTICE

CONSENT FORM FOR RESEARCH PARTICIPATION

Study Title: Is there a relationship between limited English proficiency (LEP), medication adherence behaviors, and adverse asthma outcomes in Hispanic adults with moderate or severe persistent asthma?

Principal Investigator: Archana Chandra, Nurse Practitioner

Why are you doing this study?

You are being asked to participate in a research study about Hispanic adults with moderate or severe persistent asthma. The aim of this study is to find out if Hispanic patients who speak English well have better controlled asthma than Hispanic patients who have difficulty speaking English.

What will I do if I choose to be in this study?

1. You will be asked to fill out questionnaires about:

- **English proficiency**- will inform the researcher of how well you Speak English.
- **Medication Adherence**- will inform the researcher of how often you use your controller medications for asthma.
- **Asthma control**- will inform the researcher of how well your asthma is controlled by taking your current medications.
- **Quality of life**- will inform the researcher of how satisfied you are with how well your asthma is controlled and the medications you are taking.
- **Health Literacy**- will inform the researcher how well you understand health information.

2. You will be asked to do a spirometry function test. This is the same test that you do at every follow up visit to find out what your lung function is.

3. You will be asked to provide personal information such as age, gender, sex, average income earned in a year, and level of education.

4. You will be asked to provide information regarding your asthma history such as the number of years you have had asthma, how often you have asthma flares, how often you have to go to the emergency department, and if you have ever been intubated for a severe asthma flare.

Study time: Study participation will take approximately 30 to 45 minutes per visit. After the initial visit, each participant will be asked to follow up at their assigned clinic (Visalia or Hanford) every 3 months for 6 months. This does not include any sick visits the participant has to schedule in between the required 3-month visits.

Study location: All study procedures will take place at the Baz Allergy clinics in Visalia and Hanford. If you are a patient at the Visalia office, you will continue to schedule your visits at the Visalia office and vice versa. You will not be asked to travel to a different location at any time during the study.

What are the possible risks or discomforts?

To the best of my knowledge, your participation in this study will not involve any physical or emotional risk to you beyond that of everyday life. If you feel any emotional or psychological discomfort at any time during the interview, you may take a break or ask to stop the interview. If you feel uncomfortable with any of the questions, you may also choose to not answer the question or skip to the next question.

What are the possible benefits for me or others?

Taking part in this research study may not benefit you personally. This study is designed to learn more about Hispanic adults with asthma who have difficulty speaking English. The results from this study will be used to help patients in similar situations to improve the quality of their asthma care in the future.

As with all research, there is a chance that confidentiality of the information we collect from you could be breached – we will take steps to minimize this risk. This is discussed in more detail below in this form.

How will you protect the information you collect about me, and how will that information be shared?

Results of this study may be used in presentations or publications in the future. Any information collected from you will be handled with utmost confidentiality. If the results of this study are presented or published, individual names, contact information, and any other information that could be used to identify you personally will never be used.

To minimize the risks to confidentiality, each participant will be assigned a number and this number will be linked to their information. Actual names of participants or other personal information will not be used to represent individual participants. All information will be stored in a locked cabinet at the researcher's residence. After the completion of the research study all the data collected will be shredded and disposed of with utmost care.

We may share the data we collect from you for use in future research studies or with other researchers – if we share the data that we collect about you, we will remove any information that could identify you before we share it.

If we think that you intend to harm yourself or others, we will notify the appropriate people with this information.

Financial Information

Participation in this study will involve no additional cost to you. Participating in this study is completely voluntary. You will not be paid for taking part in this study.

What are my rights as a research participant?

Participation in this study is completely voluntary. You do not have to answer any question you do not want to or feel uncomfortable answering. If at any time and for any reason, if you no longer prefer to participate in this study, please do not hesitate to inform the researcher. You can always ask to take a short break during your interview session, stop and continue at a later date, or withdraw from the study completely.

Withdrawal from this study at any time or for any reason will not need an explanation and you will not be penalized in any way for your decision. If you decide to withdraw from this study before it is completed, any information collected from you will be disposed of with the utmost care and will not be used to determine the results of the study at its completion.

Who can I contact if I have questions or concerns about this research study?

If you have questions, you may contact the researcher at:

(a) Baz Allergy, Asthma & Sinus Center (Visalia)

Phone: (559) 713-1600

Hours: 9am-6pm (Monday-Friday)

Closed between the hours of 1-2pm (Monday-Friday)

(b) Baz Allergy, Asthma & Sinus Center (Hanford)

Phone: (559) 582-8500

Hours: 9am-6pm (Monday-Friday)

Closed between the hours of 1-2pm (Monday-Friday)

Consent

I have read the contents of this consent form and the research study has been explained to me. I have been given the opportunity to ask questions and all my questions have been answered to my satisfaction. If I have any additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form.

Participant's Name (printed)

Participant's Signature

Date

**CALIFORNIA STATE UNIVERSITY, NORTHERN CALIFORNIA CONSORTIUM
DOCTOR OF NURSING PRACTICE
FORMULARIO DE CONSENTIMIENTO DE PARTICIPACIÓN EN INVESTIGACIÓN**

Título de Estudio: ¿Existe una relación entre el comportamiento de adherencia a medicamentos entre personas con dominio limitado del inglés (LEP, sus siglas en inglés), y los resultados adversos del asma en adultos Hispanos con asma persistente moderada o severa?

Estudiante Realizando la Investigación: Archana Chandra, Enfermera Practicante Médica

¿Por qué está realizando este estudio?

Se le está pidiendo participar en este trabajo de investigación sobre adultos Hispanos asma persistente moderada o severa. La meta de este estudio es descubrir si los pacientes Hispanos quienes hablan bien el inglés tienen mejor control de su asma que aquellos pacientes Hispanos quienes tienen dificultades para hablar inglés.

¿Qué haré yo si decido participar en este estudio?

1. Se le pedirá llenar un cuestionario sobre:

- **Dominio de Inglés**- le informará al investigador qué tan bien habla usted inglés.
- **Adherencia a Medicamentos** - le informará al investigador de la frecuencia con que usted usa sus medicamentos controladores de asma.
- **Control de Asma** - le informará al investigador qué tan controlada esta su asma tomando los medicamentos actuales.
- **Calidad de vida**- le informará al investigador qué tan satisfecho esta usted con lo bien que está controlada su asma y con los medicamentos que está tomando.
- **Educación de Salud**- le informará al investigador qué tan bien entiende usted la información médica.

2. Se le pedirá realizar una prueba funcional de espirometría. Esta es la misma prueba que usted hace en cada cita de seguimiento para descubrir su capacidad de funcionamiento pulmonar.

3. Se le pedirá que proporcione su información personal tal como edad, género, sexo, promedio de ingreso anual y nivel de preparación escolar.

4. Se le pedirá proporcionar información sobre su historial del asma tal como cuántos años ha sufrido de asma, qué tan seguido tiene usted crisis de asma, qué tan seguido ha ido a la emergencia, y si lo han entubado por una crisis grave de asma.

Tiempo del Estudio: La participación en el estudio tomará aproximadamente 30 a 45 minutos por visita. Después de la visita inicial, a cada participante se le pedirá que dé seguimiento con su

clínica asignada (Visalia o Hanford) en 3 meses. Esto no incluye visitas por enfermedades que el participante tenga que programar entre la visita de 3 meses requerida.

Localidad del Estudio: Todo trámite de estudio se llevará acabo en las clínicas Baz Allergy en Visalia y Hanford. Si usted es paciente en el consultorio de Visalia, usted seguirá acudiendo a citas en Visalia y vice versa. No se le pedirá que viaje a otra localidad en ningún momento durante el estudio.

¿Cuáles son los posibles riesgos o molestias?

Según lo mejor de mi conocimiento su participación en este estudio no le ocasionará ningún riesgo físico o emocional a usted mayor a lo que le cause su vida cotidiana. Si usted siente cualquier molestia emocional o psicológica en cualquier momento durante la entrevista, usted se puede tomar un descanso o pedir que se pare la entrevista. Si se siente incómodo con alguna pregunta, también puede optar por no contestarla o pasar a la siguiente pregunta.

¿Cuáles son los posibles beneficios para mi y los demás?

El participar en esta investigación quizá no le beneficie a usted en lo personal. Este estudio está diseñado para aprender más a cerca de los adultos Hispanos con asma que tienen dificultad para hablar el inglés. Los resultados de este estudio se usarán para ayudar a pacientes en situaciones similares a mejorar la calidad de su cuidado del asma en el futuro.

Como con toda investigación, existe la posibilidad de que pueda ocurrir una transgresión a la confidencialidad de la información que obtengamos de usted– tomaremos todas las medidas para minimizar este riesgo. Esto se aborda en más detalle en la parte inferior de este formulario.

¿Cómo se protegerá la información que obtenga de mi, y cómo se compartirá esta información?

Los resultados de este estudio se pueden usar en presentaciones o publicaciones en el futuro. Toda información obtenida de usted se manejará con la más estricta confidencialidad. Si los resultados de este estudio son presentados o publicados, los nombres individuales, información de contacto y cualquier otra información que se pudiera usar para identificarlo a usted personalmente nunca se utilizará.

Para amenorar riesgos a la confidencialidad, a cada participante se le asignará un número y este número estará enlazado a su información. Los nombres de los participantes u otra información personal no se usarán para representar a los participantes individuales. Toda la información se almacenará en un gabinete bajo candado en la residencia del investigador. Una vez que concluya la investigación todos los datos colectados serán destruidos y deshechos con el mayor de los cuidados.

Puede que compartamos datos que obtuvimos de usted para uso en estudios de investigación en el futuro o con otros investigadores – si llegáramos a compartir datos sobre usted, removeremos cualquier información que lo identifique antes de compartirlo.

Si creemos que usted tiene intención de lastimarse a si mismo o a otros, notificaremos a las personas adecuadas con esta información.

Información Financiera

La participación en este estudio no significará ningún costo adicional para usted. Participar en este estudio es completamente voluntario. No se le pagará por participar en el estudio.

¿Cuáles son mis derechos como participante del estudio?

Participar en este estudio es completamente voluntario. Usted no tiene obligación de contestar cualquier pregunta que no quiera o que se sienta incomodo contestando. Si en cualquier momento y por cualquier motivo, prefiere ya no seguir participando en el estudio, por favor no vacile en informárselo al investigador. Siempre podrá tomarse un pequeño descanso durante la entrevista, parar la sesión para seguir en otra fecha o darse de baja completamente del estudio. Si se da de baja del estudio en cualquier momento, por cualquier motivo no es necesario que dé una explicación y no será penalizado de ninguna forma por su decisión. Si usted decide retirarse del estudio antes de que se complete, todos los datos colectados serán deshechos con el mayor cuidado y no se usarán para determinar los resultados del estudio cuando este concluya.

¿Con quién me comunico si tengo preguntas o inquietudes sobre este estudio?

Si tiene preguntas, puede contactarse con el investigador en:

(a) Baz Allergy, Asthma & Sinus Center (Visalia)

Tel: (559) 713-1600

Horario: 9am-6pm (Lunes-Viernes)

Cierran entre 1-2pm (Lunes-Viernes)

(b) Baz Allergy, Asthma & Sinus Center (Hanford)

Tel: (559) 582-8500

Horario: 9am-6pm (Lunes-Viernes)

Cierran entre 1-2pm (Lunes-Viernes)

Consentimiento

He leído el contenido de este formulario de consentimiento y se me ha explicado el estudio. Se me ha dado la oportunidad de hacer preguntas y todas se han contestado a mi satisfacción. Si tengo más preguntas, me han dicho con quien contactarme. Estoy de acuerdo en participar en este estudio de investigación como se describe anteriormente y se me entregará una copia de este consentimiento.

Nombre del Participante (en letra de molde)

Firma del Participante

Fecha

Test of Functional Health Literacy in Adults

Short Test of Functional Health Literacy in Adults (STOFHLA)

STOFHLA
Large Print Version
English, 14 point font

Short Test of Functional Literacy in Adults
STOFHLA
READING COMPREHENSION

HAND PATIENT THE READING COMPREHENSION PASSAGES TO BE COMPLETED. FOLD BACK THE PAGE OPPOSITE THE TEXT SO THAT THE PATIENT SEES ONLY THE TEXT.

PREFACE THE READING COMPREHENSION EXERCISE WITH:

“Here are some other medical instructions that you or anybody might see around the hospital. These instructions are in sentences that have some of the words missing. Where a word is missing, a blank line is drawn, and 4 possible words that could go in the blank appear just below it. I want you to figure out which of those 4 words should go in the blank, which word makes the sentence make sense. When you think you know which one it is, circle the letter in front of that word, and go on to the next one. When you finish the page, turn the page and keep going until you finish all the pages.”

STOP AT THE END OF 7 MINUTES

PASSAGE A: X-RAY PREPARATION

PASSAGE B: MEDICAID RIGHTS AND RESPONSIBILITIES

PASSAGE A

Your doctor has sent you to have a _____ X-ray.

- a. stomach
- b. diabetes
- c. stitches
- d. germs

You must have an _____ stomach when you come for _____.

a. asthma	a. is.
b. empty	b. am.
c. incest	c. if.
d. anemia	d. it.

The X-ray will _____ from 1 to 3 _____ to do.

a. take	a. beds
b. view	b. brains
c. talk	c. hours
d. look	d. diets

THE DAY BEFORE THE X-RAY.

For supper have only a _____ snack of fruit, _____ and jelly,

a. little	a. toes
b. broth	b. throat
c. attack	c. toast
d. nausea	d. thigh

with coffee or tea.

After _____, you must not _____ or drink

a. minute,	a. easy
b. midnight,	b. ate
c. during,	c. drank
d. before,	d. eat

anything at _____ until after you have _____ the X-ray.

a. ill	a. are
b. all	b. has
c. each	c. had
d. any	d. was

THE DAY OF THE X-RAY.

Do not eat _____.

- a. appointment.
- b. walk-in.
- c. breakfast.
- d. clinic.

Do not _____, even _____.

a. drive,	a. heart.
b. drink,	b. breath.
c. dress,	c. water.
d. dose,	d. cancer.

If you have any _____, call the X-ray _____ at 616-4500.

a. answers,	a. Department
b. exercises,	b. Sprain
c. tracts,	c. Pharmacy
d. questions,	d. Toothache

PASSAGE B

I agree to give correct information to _____ if I can receive Medicaid.

- a. hair
- b. salt
- c. see
- d. ache

I _____ to provide the county information to _____ any

a. agree	a. hide
b. probe	b. risk
c. send	c. discharge
d. gain	d. prove

statements given in this _____ and hereby give permission to

- a. emphysema
- b. application
- c. gallbladder
- d. relationship

the _____ to get such proof. I _____ that for

a. inflammation	a. investigate
b. religion	b. entertain
c. iron	c. understand
d. county	d. establish

Medicaid I must report any _____ in my circumstances

- a. changes
- b. hormones
- c. antacids
- d. charges

within _____ (10) days of becoming _____ of the change.

a. three	a. award
b. one	b. aware
c. five	c. away
d. ten	d. await

I understand _____ if I DO NOT like the _____ made on my

a. thus	a. marital
b. this	b. occupation
c. that	c. adult
d. than	d. decision

case, I have the _____ to a fair hearing. I can _____ a

a. bright	a. request
b. left	b. refuse
c. wrong	c. fail
d. right	d. mend

hearing by writing or _____ the county where I applied.

- a. counting
- b. reading
- c. calling
- d. smelling

If you _____ TANF for any family _____, you will have to

a. wash	a. member,
b. want	b. history,
c. cover	c. weight,
d. tape	d. seatbelt,

_____ a different application form. _____ , we will use

- a. relax
- b. break
- c. inhale
- d. sign

- a. Since,
- b. Whether,
- c. However,
- d. Because,

the _____ on this form to determine your _____ .

- a. lung
- b. date
- c. meal
- d. pelvic

- a. hypoglycemia.
- b. eligibility.
- c. osteoporosis.
- d. schizophrenia.

Test of Functional Health Literacy in Adults

Short Test of Functional Health Literacy in Adults (STOFHLA)

STOFHLA
Large Print Version
Spanish, 14 point font

Short Test of Functional Literacy in Adults
STOFHLA-SPANISH
READING COMPREHENSION

HAND PATIENT THE READING COMPREHENSION PASSAGES TO BE COMPLETED. FOLD BACK THE PAGE OPPOSITE THE TEXT SO THAT THE PATIENT SEES ONLY THE TEXT.

PREFACE THE READING COMPREHENSION EXERCISE WITH:

“Estas son ALGUNAS instrucciones médicas que Ud. o cualquier persona puede encontrar aquí en el hospital. En cada frase faltan algunas palabras; donde falta la palabra, hay un espacio en blanco y luego hay 4 posibles palabras para escoger. Quisiera que Ud. lea la frase y decida cuál de estas cuatro palabras es la palabra que falta en la frase, o que le da mejor sentido a la frase. Cuando Ud. decida cuál es la palabra correcta para aquel espacio, marque con un círculo la palabra que Ud. ha escogido y siga leyendo. Cuando termine la página, continúe en la página siguiente hasta terminar todas.”

STOP AT THE END OF 7 MINUTES

PASSAGE A: X-RAY PREPARATION

PASSAGE B: MEDICAID APPLICATION

LECTURA A

Su doctor le ha _____ a sacarse Rayos X del _____.

- a. distinguido
- b. mandado
- c. corrido
- d. formalmente

- a. estómago.
- b. caminar.
- c. vestido.
- d. comunmente.

Cuando venga por los _____ debe de tener el estómago _____.

- a. libros
- b. fiel
- c. Rayos X
- d. dormir

- a. volar.
- b. cabeza.
- c. vacío.
- d. contento.

Este examen de Rayos X _____ de 1 a 3 _____.

- a. durará
- b. cantará
- c. permanente
- d. silla

- a. millas.
- b. luz.
- c. Rayos X.
- d. horas.

El día antes de _____ radiografía, cene solamente alguna _____.

- a. del
- b. alguna
- c. la
- d. botón

- a. bailar,
- b. inteligente,
- c. fruta,
- d. receta,

pan con mermelada, y _____ o té. Después de

- a. lentes
- b. café
- c. cantar
- d. pensamiento

la _____, no debe comer ni _____ absolutamente

a. taciturno,	a. beber
b. vehículo,	b. nadar
c. medianoche,	c. cabello
d. poder,	d. conocimiento

nada hasta después _____ que le hayan tomado la _____.

a. sentar	a. radiografía.
b. cansar	b. calcomanía.
c. de	c. advertencia.
d. contra	d. estrujar.

El día de la radiografía, no _____. No beba nada, ni _____.

a. faceta.	a. agua.
b. desayune.	b. hierba.
c. observe.	c. avaro.
d. estruendo.	d. maleta.

Si Ud. tiene alguna _____, llame al departamento de Rayos X

- a. pregunta,
b. respuesta,
c. caliente,
d. doctor,

al número (310) 222-2821.

LECTURA B

Yo acepto dar información correcta para ver si puedo recibir Medi-Cal.

Yo acepto proveer _____ al condado para verificar _____

a. información	a. desde
b. positivo	b. cualquier
c. procurar	c. fascinante
d. visión	d. bien

declaración dada en esta _____ y por consiguiente doy _____

a. solicitud	a. boletos
b. periódico	b. permiso
c. fantástico	c. mirar
d. amplitud	d. con

al condado para obtener _____ información. Yo entiendo que

a. dicha
b. noticias
c. estar
d. testarudo

_____ la responsabilidad de _____ a Medi-Cal dentro

a. una	a. comentar
b. desigualdad	b. papel
c. ganas	c. notificar
d. tengo	d. desalmado

de _____ período de diez días _____ de enterarme

- a. un
- b. a
- c. tiempo
- d. llamar

- a. recipiente
- b. entonces
- c. después
- d. formula

de un _____ en mi situación. Yo _____ que si no estoy

- a. canto
- b. cambio
- c. girar
- d. mes

- a. saco
- b. letra
- c. entiendo
- d. de

_____ con la decisión tomada _____ mi solicitud, yo

- a. estudiando
- b. satisfecho/a
- c. lección
- d. sin

- a. arriba
- b. sobre
- c. pensado
- d. pronto

tengo _____ a una audiencia con _____ condado. Yo

- a. derecho
- b. prosperidad
- c. salir
- d. valor

- a. el
- b. estos
- c. increíble
- d. hospital

puedo pedir _____ audiencia escribiendo o _____ a la

- a. estipular
- b. confianza
- c. donde
- d. una

- a. candado
- b. honesto
- c. llamando
- d. llorando

oficina del _____ donde entregué mi solicitud.

- a. condado
- b. escuela
- c. ver
- d. altivo

_____ Ud. quiere TANF/Welfare para _____

- a. A
- b. Corriendo
- c. Decididamente
- d. Si

- a. deber
- b. cualquier
- c. escritorio
- d. vacilar

miembro de su familia, tiene que llenar otro tipo de solicitud.

ASTHMA CONTROL QUESTIONNAIRE (ACQ)

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QOL TECHNOLOGIES LTD.

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DECEMBER 2002

Please answer questions 1 - 6.

Circle the number of the response that best describes how you have been during the past week.

1. On average, during the past week, how often were you woken by your asthma during the night?	0 Never
1 Hardly ever
2 A few times
3 Several times
4 Many times
5 A great many times
6 Unable to sleep because of asthma
2. On average, during the past week, how bad were your asthma symptoms when you woke up in the morning?	0 No symptoms
1 Very mild symptoms
2 Mild symptoms
3 Moderate symptoms
4 Quite severe symptoms
5 Severe symptoms
6 Very severe symptoms
3. In general, during the past week, how limited were you in your activities because of your asthma?	0 Not limited at all
1 Very slightly limited
2 Slightly limited
3 Moderately limited
4 Very limited
5 Extremely limited
6 Totally limited
4. In general, during the past week, how much shortness of breath did you experience because of your asthma?	0 None
1 A very little
2 A little
3 A moderate amount
4 Quite a lot
5 A great deal
6 A very great deal

ASTHMA CONTROL QUESTIONNAIRE©

PATIENT ID: _____

DATE: _____

Page 2 of 2

5. In general, during the past week, how much of the time did you wheeze ?	0 Not at all
1 Hardly any of the time
2 A little of the time
3 A moderate amount of the time
4 A lot of the time
5 Most of the time
6 All the time
6. On average, during the past week, how many puffs/inhalations of short-acting bronchodilator (eg. Ventolin/Bricanyl) have you used each day?
<i>(If you are not sure how to answer this question, please ask for help)</i>	0 None
1 1 - 2 puffs/inhalations most days
2 3 - 4 puffs/inhalations most days
3 5 - 8 puffs/inhalations most days
4 9 - 12 puffs/inhalations most days
5 13 - 16 puffs/inhalations most days
6 More than 16 puffs/inhalations most days

To be completed by a member of the clinic staff

7. FEV ₁ pre-bronchodilator:	0 > 95% predicted
FEV ₁ predicted:	1 95 - 90%
FEV ₁ %predicted:	2 89 - 80%
(Record actual values on the dotted lines and score the FEV ₁ % predicted in the next column)	3 79 - 70%
	4 69 - 60%
	5 59 - 50%
	6 < 50% predicted

CUESTIONARIO SOBRE EL CONTROL DEL ASMA (ACQ)

SPANISH VERSION FOR THE USA

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QOL TECHNOLOGIES LTD.

Para más información diríjase a:

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MAY 2017

CUESTIONARIO SOBRE EL CONTROL
DEL ASMA®
(SPANISH VERSION FOR THE USA)

IDENTIFICACIÓN
DEL PACIENTE: _____

FECHA: _____

Página 1 de 2

Sírvase responder a las preguntas 1-6.

Marque con un círculo el número de la respuesta que mejor describa cómo se ha sentido usted durante los últimos 7 días.

1. Como promedio, ¿con qué frecuencia lo ha despertado por la noche el asma durante los últimos 7 días?	0 Nunca
1 Casi nunca
2 Unas cuantas veces
3 Varias veces
4 Muchas veces
5 Muchísimas veces
6 Incapaz de dormir por el asma
2. Como promedio, ¿qué tan graves han sido sus síntomas del asma cuando se despertaba por la mañana durante los últimos 7 días?	0 Ningún síntoma
1 Síntomas muy leves
2 Síntomas leves
3 Síntomas moderados
4 Síntomas un tanto graves
5 Síntomas graves
6 Síntomas muy graves
3. En general, ¿qué tanto lo ha limitado el asma en sus actividades durante los últimos 7 días?	0 Nada
1 Casi nada
2 Un poco
3 Regular
4 Mucho
5 Muchísimo
6 Totalmente
4. En general, ¿qué tanta falta de aire ha sentido a causa del asma durante los últimos 7 días?	0 Nada
1 Casi nada
2 Un poco
3 Regular
4 Bastante
5 Mucha
6 Muchísima

CUESTIONARIO SOBRE EL CONTROL
DEL ASMA®
(SPANISH VERSION FOR THE USA)

IDENTIFICACIÓN
DEL PACIENTE: _____

FECHA: _____

Página 2 de 2

5. En general, ¿qué tanto tiempo le ha **silbado o chiflado** el pecho durante los últimos 7 días?
- 0 Nunca
 - 1 Casi nunca
 - 2 Poco tiempo
 - 3 Parte del tiempo
 - 4 Gran parte del tiempo
 - 5 Casi siempre
 - 6 Siempre
6. Durante los últimos 7 días, como promedio, ¿cuántos **disparos o inhalaciones del broncodilatador de efecto inmediato** (p. ej. Ventolín o Bricanyl) se ha aplicado usted cada día? *(Si no sabe muy bien cómo contestar a esta pregunta, por favor pida ayuda)*
- 0 Ninguno
 - 1 1 - 2 disparos/inhalaciones la mayoría de los días
 - 2 3 - 4 disparos/inhalaciones la mayoría de los días
 - 3 5 - 8 disparos/inhalaciones la mayoría de los días
 - 4 9 -12 disparos/inhalaciones la mayoría de los días
 - 5 13 - 16 disparos/inhalaciones la mayoría de los días
 - 6 Más de 16 disparos/inhalaciones la mayoría de los días

La siguiente información debe ser llenada por un miembro del personal clínico

7. VEF₁ pre-broncodilatador 0 > 95 % predicho
- VEF₁ predicho..... 1 95 – 90 %
- % de VEF₁ predicho..... 2 89 – 80 %
- (Escriba las cifras reales sobre la línea de puntos y marque el % de VEF₁ predicho en la próxima columna.) 3 79 – 70 %
- 4 69 – 60 %
- 5 59 – 50 %
- 6 < 50 % predicho

ASTHMA QUALITY OF LIFE QUESTIONNAIRE WITH STANDARDISED ACTIVITIES (AQLQ(S))

SELF-ADMINISTERED
(≥12 years)

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QOL TECHNOLOGIES LTD.

For further information:

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APRIL 2008

Modified September 2010
AQLQ(S) ≥12 years SA North American English Version

ASTHMA QUALITY OF LIFE QUESTIONNAIRE (S)

PATIENT ID: _____

SELF-ADMINISTERED

DATE: _____

Page 1 of 5

Please complete **all** questions by circling the number that best describes how you have been during the **last 2 weeks as a result of your asthma.**

HOW LIMITED HAVE YOU BEEN DURING THE LAST 2 WEEKS IN THESE ACTIVITIES AS A RESULT OF YOUR ASTHMA?

	Totally Limited	Extremely Limited	Very Limited	Moderate Limitation	Some Limitation	A Little Limitation	Not at all Limited
1. STRENUOUS ACTIVITIES (such as hurrying, exercising, running up stairs, sports)	1	2	3	4	5	6	7
2. MODERATE ACTIVITIES (such as walking, housework, gardening, shopping, climbing stairs)	1	2	3	4	5	6	7
3. SOCIAL ACTIVITIES (such as talking, playing with pets/children, visiting friends/relatives)	1	2	3	4	5	6	7
4. WORK/SCHOOL-RELATED ACTIVITIES* (tasks you have to do at work/in school)	1	2	3	4	5	6	7
5. SLEEPING	1	2	3	4	5	6	7

*If you are not employed or self-employed, these should be tasks you have to do most days.

HOW MUCH DISCOMFORT OR DISTRESS HAVE YOU FELT DURING THE LAST 2 WEEKS?

	A Very Great Deal	A Great Deal	A Good Deal	Moderate Amount	Some	Very Little	None
6. How much discomfort or distress have you felt over the last 2 weeks as a result of CHEST TIGHTNESS?	1	2	3	4	5	6	7

ASTHMA QUALITY OF LIFE QUESTIONNAIRE (S)

PATIENT ID: _____

SELF-ADMINISTERED

DATE: _____

Page 2 of 5

IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	Hardly Any of the Time	None of the Time
7. Feel CONCERNED ABOUT HAVING ASTHMA?	1	2	3	4	5	6	7
8. Feel SHORT OF BREATH as a result of your asthma?	1	2	3	4	5	6	7
9. Experience asthma symptoms as a RESULT OF BEING EXPOSED TO CIGARETTE SMOKE?	1	2	3	4	5	6	7
10. Experience a WHEEZE in your chest?	1	2	3	4	5	6	7
11. Feel you had to AVOID A SITUATION OR ENVIRONMENT BECAUSE OF CIGARETTE SMOKE?	1	2	3	4	5	6	7

HOW MUCH DISCOMFORT OR DISTRESS HAVE YOU FELT DURING THE LAST 2 WEEKS?

	A Very Great Deal	A Great Deal	A Good Deal	Moderate Amount	Some	Very Little	None
12. How much discomfort or distress have you felt over the last 2 weeks as a result of COUGHING?	1	2	3	4	5	6	7

IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	Hardly Any of the Time	None of the Time
13. Feel FRUSTRATED as a result of your asthma?	1	2	3	4	5	6	7
14. Experience a feeling of CHEST HEAVINESS?	1	2	3	4	5	6	7

ASTHMA QUALITY OF LIFE QUESTIONNAIRE (S)

PATIENT ID: _____

SELF-ADMINISTERED

DATE: _____

Page 3 of 5

IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	Hardly Any of the Time	None of the Time
15. Feel CONCERNED ABOUT THE NEED TO USE MEDICATION for your asthma?	1	2	3	4	5	6	7
16. Feel the need to CLEAR YOUR THROAT?	1	2	3	4	5	6	7
17. Experience asthma symptoms as a RESULT OF BEING EXPOSED TO DUST?	1	2	3	4	5	6	7
18. Experience DIFFICULTY BREATHING OUT as a result of your asthma?	1	2	3	4	5	6	7
19. Feel you had to AVOID A SITUATION OR ENVIRONMENT BECAUSE OF DUST?	1	2	3	4	5	6	7
20. WAKE UP IN THE MORNING WITH ASTHMA SYMPTOMS?	1	2	3	4	5	6	7
21. Feel AFRAID OF NOT HAVING YOUR ASTHMA MEDICATION AVAILABLE?	1	2	3	4	5	6	7
22. Feel bothered by HEAVY BREATHING?	1	2	3	4	5	6	7
23. Experience asthma symptoms as a RESULT OF THE WEATHER OR AIR POLLUTION OUTSIDE?	1	2	3	4	5	6	7
24. Were you WOKEN AT NIGHT by your asthma?	1	2	3	4	5	6	7
25. AVOID OR LIMIT GOING OUTSIDE BECAUSE OF THE WEATHER OR AIR POLLUTION?	1	2	3	4	5	6	7

ASTHMA QUALITY OF LIFE QUESTIONNAIRE (S)

PATIENT ID: _____

SELF-ADMINISTERED

DATE: _____

Page 4 of 5

IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	Hardly Any of the Time	None of the Time
26. Experience asthma symptoms as a RESULT OF BEING EXPOSED TO STRONG SMELLS OR PERFUME?	1	2	3	4	5	6	7
27. Feel AFRAID OF GETTING OUT OF BREATH?	1	2	3	4	5	6	7
28. Feel you had to AVOID A SITUATION OR ENVIRONMENT BECAUSE OF STRONG SMELLS OR PERFUME?	1	2	3	4	5	6	7
29. Has your asthma INTERFERED WITH GETTING A GOOD NIGHT'S SLEEP?	1	2	3	4	5	6	7
30. Have a feeling of FIGHTING FOR AIR?	1	2	3	4	5	6	7

HOW LIMITED HAVE YOU BEEN DURING THE LAST 2 WEEKS?

	Severely Limited Most Not Done	Very Limited	Moderately Limited Several Not Done	Slightly Limited	Very Slightly Limited Very Few Not Done	Hardly Limited At All	Not Limited Have Done All Activities
31. Think of the OVERALL RANGE OF ACTIVITIES that you would have liked to have done during the last 2 weeks. How much has your range of activities been limited by your asthma?	1	2	3	4	5	6	7

ASTHMA QUALITY OF LIFE QUESTIONNAIRE (S)

PATIENT ID: _____

SELF-ADMINISTERED

DATE: _____

Page 5 of 5

HOW LIMITED HAVE YOU BEEN DURING THE LAST 2 WEEKS?

	Totally Limited	Extremely Limited	Very Limited	Moderate Limitation	Some Limitation	A Little Limitation	Not at all Limited
32. Overall, among ALL THE ACTIVITIES that you have done during the last 2 weeks, how limited have you been by your asthma?	1	2	3	4	5	6	7

DOMAIN CODE:

Symptoms: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 29, 30
 Activity Limitation: 1, 2, 3, 4, 5, 11, 19, 25, 28, 31, 32
 Emotional Function: 7, 13, 15, 21, 27
 Environmental Stimuli: 9, 17, 23, 26

CUESTIONARIO SOBRE CALIDAD DE VIDA PARA PACIENTES CON ASMA: VERSIÓN CON LISTA UNIFORME DE ACTIVIDADES (AQLQ(S))

**PARA LLENAR UNO MISMO
(SELF-ADMINISTERED)
SPANISH VERSION FOR THE USA**

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MAY 2017

CUESTIONARIO SOBRE CALIDAD DE VIDA
PARA PACIENTES CON ASMA (AQLQ(S))
(SPANISH VERSION FOR THE USA)
PARA LLENAR UNO MISMO

IDENTIFICACIÓN
DEL PACIENTE

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Sírvase responder a **todas** las preguntas marcando con un círculo el número que mejor describa cómo se ha sentido usted durante las **últimas 2 semanas a causa del asma**.

¿CUÁNTO LO HA LIMITADO EL ASMA DURANTE LAS ÚLTIMAS 2 SEMANAS EN ESTAS ACTIVIDADES?

	Totalmente	Muchísimo	Mucho	Regular	Un poco	Casi nada	Nada
1. ACTIVIDADES DE MUCHO ESFUERZO (como andar de prisa, hacer ejercicios, subir corriendo por las escaleras, hacer deportes)	1	2	3	4	5	6	7
2. ACTIVIDADES DE ESFUERZO MODERADO (como caminar, hacer labores del hogar, trabajar en el jardín o el patio, ir de compras, subir caminando por las escaleras)	1	2	3	4	5	6	7
3. ACTIVIDADES SOCIALES (como conversar, jugar con animales domésticos o con niños, visitar a amigos o familiares)	1	2	3	4	5	6	7
4. ACTIVIDADES RELACIONADAS CON EL TRABAJO (tareas que tiene que hacer en el trabajo *)	1	2	3	4	5	6	7

**Si no tiene empleo ni trabaja por cuenta propia, éstas deben ser tareas que tiene que hacer casi todos los días.*

5. DORMIR	1	2	3	4	5	6	7
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¿CUÁNTO MALESTAR FÍSICO O EMOCIONAL HA SENTIDO DURANTE LAS ÚLTIMAS 2 SEMANAS?

	Muchísimo	Mucho	Bastante	Regular	Un poco	Casi nada	Nada
6. ¿Cuánto malestar físico o emocional ha sentido durante las últimas 2 semanas a causa de LA OPRESIÓN O APRETAZÓN EN EL PECHO?	1	2	3	4	5	6	7

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EN GENERAL, ¿CUÁNTO TIEMPO DURANTE LAS ÚLTIMAS 2 SEMANAS...

	Siempre	Casi siempre	Gran parte del tiempo	Parte del tiempo	Poco tiempo	Casi nunca	Nunca
7. se ha sentido PREOCUPADO PORQUE TIENE ASMA?	1	2	3	4	5	6	7
8. ha sentido FALTA DE AIRE a causa del asma?	1	2	3	4	5	6	7
9. ha tenido síntomas de asma POR EXPONERSE AL HUMO DEL CIGARRILLO?	1	2	3	4	5	6	7
10. ha sentido un SILBIDO, CHIFLIDO O PITO en el pecho?	1	2	3	4	5	6	7
11. le ha parecido que tenía que EVITAR UNA SITUACIÓN O LUGAR POR EL HUMO DEL CIGARRILLO?	1	2	3	4	5	6	7

¿CUÁNTO MALESTAR FÍSICO O EMOCIONAL HA SENTIDO DURANTE LAS ÚLTIMAS 2 SEMANAS?

	Muchísimo	Mucho	Bastante	Regular	Un poco	Casi nada	Nada
12. ¿Cuánto malestar físico o emocional ha sentido durante las últimas 2 semanas a causa de la TOS?	1	2	3	4	5	6	7

EN GENERAL, ¿CUÁNTO TIEMPO DURANTE LAS ÚLTIMAS 2 SEMANAS...

	Siempre	Casi siempre	Gran parte del tiempo	Parte del tiempo	Poco tiempo	Casi nunca	Nunca
13. se ha sentido FRUSTRADO a causa del asma?	1	2	3	4	5	6	7
14. ha sentido DOLOR EN LA ESPALDA O EN EL PECHO a causa del asma?	1	2	3	4	5	6	7

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EN GENERAL, ¿CUÁNTO TIEMPO DURANTE LAS ÚLTIMAS 2 SEMANAS...

	Siempre	Casi siempre	Gran parte del tiempo	Parte del tiempo	Poco tiempo	Casi nunca	Nunca
15. se ha sentido PREOCUPADO POR LA NECESIDAD DE USAR MEDICAMENTOS para el asma?	1	2	3	4	5	6	7
16. ha sentido la necesidad de CARRASPEAR O ACLARARSE LA GARGANTA?	1	2	3	4	5	6	7
17. ha tenido síntomas de asma POR EXPONERSE AL POLVO?	1	2	3	4	5	6	7
18. ha tenido DIFICULTAD PARA INHALAR a causa del asma?	1	2	3	4	5	6	7
19. le ha parecido que tenía que EVITAR UNA SITUACIÓN O LUGAR POR EL POLVO?	1	2	3	4	5	6	7
20. SE HA DESPERTADO POR LA MAÑANA CON SÍNTOMAS DE ASMA?	1	2	3	4	5	6	7
21. ha tenido MIEDO DE NO TENER SU MEDICAMENTO PARA EL ASMA A LA MANO?	1	2	3	4	5	6	7
22. lo ha molestado la RESPIRACIÓN DIFÍCIL O CON ESFUERZO?	1	2	3	4	5	6	7
23. ha tenido síntomas de asma A CAUSA DE LA CONDICIÓN DEL TIEMPO O DE LA CONTAMINACIÓN DEL AIRE?	1	2	3	4	5	6	7
24. lo ha DESPERTADO POR LA NOCHE el asma?	1	2	3	4	5	6	7
25. HA EVITADO SALIR O HA LIMITADO SUS SALIDAS POR LA CONDICIÓN DEL TIEMPO O LA CONTAMINACIÓN DEL AIRE?	1	2	3	4	5	6	7

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EN GENERAL, ¿CUÁNTO TIEMPO DURANTE LAS ÚLTIMAS 2 SEMANAS...

	Siempre	Casi siempre	Gran parte del tiempo	Parte del tiempo	Poco tiempo	Casi nunca	Nunca
26. ha tenido síntomas de asma POR EXPONERSE A OLORES O PERFUMES FUERTES?	1	2	3	4	5	6	7
27. ha tenido MIEDO DE QUEDARSE SIN AIRE O RESPIRACIÓN?	1	2	3	4	5	6	7
28. le ha parecido que tenía que EVITAR UNA SITUACIÓN O LUGAR POR LOS OLORES O PERFUMES FUERTES?	1	2	3	4	5	6	7
29. el asma le ha IMPEDIDO DORMIR BIEN?	1	2	3	4	5	6	7
30. ha tenido la sensación de ESTAR BATALLANDO PARA RESPIRAR?	1	2	3	4	5	6	7

AHORA VAMOS A PREGUNTARLE DE TODAS LAS ACTIVIDADES QUE HIZO O QUE HUBIERA QUERIDO HACER DURANTE LAS ÚLTIMAS 2 SEMANAS.

¿CUÁNTO LO HA LIMITADO EL ASMA DURANTE LAS ÚLTIMAS 2 SEMANAS?

	La mayoría	Muchas	Varias	Algunas	Muy pocas	Casi ninguna	Ninguna (es decir he hecho todas las actividades que quería)
31. Piense en la TOTALIDAD DE LAS ACTIVIDADES que le hubiera gustado hacer durante las últimas 2 semanas. ¿Cuántas de estas actividades ha dejado de hacer a causa del asma?	1	2	3	4	5	6	7

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¿CUÁNTO LO HA LIMITADO EL ASMA DURANTE LAS ÚLTIMAS 2 SEMANAS?
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	Totalmente	Muchísimo	Mucho	Regular	Un poco	Casi nada	Nada
32. En general, entre TODAS LAS ACTIVIDADES que usted ha hecho durante las últimas 2 semanas, ¿cuánto lo ha limitado el asma?	1	2	3	4	5	6	7

CLAVE DE LOS CAMPOS:

Síntomas: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 29, 30
Limitación para hacer las actividades: 1, 2, 3, 4, 5, 11, 19, 25, 28, 31, 32
Funcionamiento emocional: 7, 13, 15, 21, 27
Estímulos ambientales: 9, 17, 23, 26

Appendix I: Medication Adherence Rating Scale (MARS)

Medication Adherence Rating Scale (MARS)

This scale is based on two already existing self-report measures of compliance. The first is the Drug Attitude Inventory (DAI) (Hogan, Awad and Eastwood, 1983), and the second is the Medication Adherence Questionnaire (MAQ) (Morisky, Green and Levine, 1986). These compliance measures have been combined to produce a compliance scale.

The MARS consists of 10 items that require yes/no responses. The first 4 items are based on the MAQ, and are scored, no = 1 and yes = 0. The remaining items are from the DAI and are coded as follows: Q5, Q6, Q9, Q10, no = 1 and yes = 0; Q7, Q8, no = 0 and yes = 1. A total score will then reflect a greater degree of compliance if it is high, and non-compliance if it is low. However one must always keep in mind that any measure of self-reported compliance will overestimate compliance by approximately 30%.

Hogan, T P, Awad, A G, and Eastwood, R (1983) A self-report scale predictive of drug compliance in schizophrenics: reliability and discriminative validity, *Psychological Medicine*, 13, 177-183.

Morisky, D E, Green, L W, and Levine, D M (1986) Concurrent and predictive validity of a self-reported measure of medication adherence. *Medical Care*, 24(1), 67-74.

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Medication Adherence Rating Scale

Please respond to the following statements by circling the response which best describes your behaviour or the attitude you have held toward your medication in the past week.

1. Do you ever forget to take your medication?	Yes / No
2. Are you careless at times about taking your medicine?	Yes / No
3. When you feel better,
do you sometimes stop taking your medicine?	Yes / No
4. Sometimes if you feel worse when you take the medicine,
do you stop taking it?	Yes / No
5. I take my medication only when I am sick	Yes / No
6. It is unnatural for my mind and body
to be controlled by medication	Yes / No
7. My thoughts are clearer on medication	Yes / No
8. By staying on medication I can prevent getting sick	Yes / No
9. I feel weird, like a “zombie”, on medication	Yes / No
10. Medication makes me feel tired and sluggish	Yes / No

Appendix J: Medication Adherence Rating Scale (MARS) (Spanish)

Escala de Evaluación de Adherencia a Medicamentos (MARS)

Esta escala se basa en dos medidas del cumplimiento de autoinforme ya existentes. La primera es el Inventario de Actitud a Medicamentos (DAI) (Hogan, Awad y Eastwood, 1983), y la segunda es el Cuestionario de Adherencia a Medicamentos (MAQ) (Morisky, Green y Levine, 1986). Estas medidas del cumplimiento se han combinado para producir la escala de cumplimiento.

El MARS consiste de 10 preguntas/declaraciones que requieren respuestas de sí/no. Las primeras 4 se basan en el MAQ, y se califican así: no = 1 y sí = 0. Las restantes son del DAI y se codifican de la siguiente forma: Q5, Q6, Q9, Q10, no = 1 y sí = 0; Q7, Q8, no = 0 y sí = 1. La suma total entonces reflejará un mayor grado de cumplimiento si el resultado es alto y de no cumplimiento si es bajo. Sin embargo, uno debe considerar que cualquier medida del cumplimiento auto informado sobreestimaré el cumplimiento por aproximadamente 30%.

Hogan, T P, Awad, A G, y Eastwood, R (1983) Escala de autoinforme predecible de cumplimiento de medicamentos en esquizofrenia: fiabilidad y validez discriminatoria, *Medicina Psicológica*, 13, 177-183.

Morisky, D E, Green, L W, y Levine, D M (1986) Validez concurrente y predecible de medidas de autoinforme de adherencia a medicamento. *Cuidado Médico*, 24(1), 67-74.

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Escala de Evaluación de Adherencia a Medicamentos

Por favor conteste a las siguientes declaraciones haciendo un círculo alrededor de la respuesta que mejor describa su comportamiento o actitud hacia su medicamento en la semana pasada.

1. ¿Se le ha olvidado a veces tomar su medicamento?	Sí / No
2. ¿Es a veces descuidado(a) para tomar su medicina?	Sí / No
3. ¿Cuando se siente mejor, a veces deja de tomar su medicina?	Sí / No
4. ¿A veces, si se siente peor cuando se toma la medicina, deja de tomarla?	Sí / No
5. Yo me tomo el medicamento sólo cuando estoy enfermo(a).	Sí / No
6. Es antinatural para mi mente y mi cuerpo estar controlado por medicamento.	Sí / No
7. Mis pensamientos están más claros cuando tomo la medicina.	Sí / No
8. Al seguir tomando los medicamentos puedo prevenir enfermarme.	Sí / No
9. Me siento raro(a), como “zombi”, tomando la medicina.	Sí / No
10. El medicamento me hace sentir cansado(a) y perezoso(a)	Sí / No