Driving Sleep and Respiratory Market Growth Through Inclusivity

by

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Abstract

In this review, I analyzed health disparities in the Hispanic/Latino population in the United States, focusing on sleep and respiratory illnesses. To better understand the nature of these health disparities, some of the significant factors analyzed include the demographic structure, access to care, and prevalence of sleep and respiratory illnesses. A major issue I examined in this report is the lack of knowledge regarding sleep and respiratory diseases as a result of the language barrier, underdiagnosis, and lack of health insurance. The sleep and respiratory diseases analyzed are Chronic Obstructive Pulmonary Disease (COPD) and Obstructive Sleep Apnea (OSA). Some of the major areas I examined include prevalence, diagnosis, and adherence to medical equipment compared to other ethnic groups. The primary research is based on OSA patient interviews and Durable Medical Equipment (DME) providers. The secondary research is focused on community health studies. This report explores current sleep and respiratory initiatives and their inclusiveness to the Spanish-speaking population.

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1.0 Introduction

Sleep and respiratory diseases are major chronic diseases in the United States, led by Chronic Obstructive Pulmonary Disease (COPD) and Obstructive Sleep Apnea (OSA). COPD refers to a group of diseases that cause airflow blockage and significant breathing-related problems. Approximately 16 million Americans are impacted by this disease each year (CDC, 2021). OSA is a condition characterized by repeatedly interrupted breathing during sleep, this frequently occurs in adults (CDC, 2012). An estimated 22 million Americans suffer from OSA, and 80% of the cases are undiagnosed (Sleep Apnea, 2021).

These diseases affect all of the United States population regardless of their race or ethnic background. However, research shows the Hispanic population has been significantly underdiagnosed for both sleep and respiratory illnesses (Redline, 2013). The main reasons for these inefficiencies include language barriers, lack of health insurance, and insufficient health education.

This report aims to address the large disparities Hispanic patients face in sleep and respiratory illnesses as a result of underdiagnosis, equipment adherence, and language barriers. More specifically, this report details initiatives that sleep and respiratory organizations can implement to provide equal access to care. Higher inclusivity will result in better health outcomes, lower costs, and more efficient care.

2.0 Methods

There is limited data regarding Hispanic patients' prevalence, treatment adherence, and targeted initiatives tied to sleep and respiratory diseases. The primary and secondary research conducted evaluates the need for better diagnosis tools, labeling and packaging in multiple languages, and target marketing in this population.

The primary research involves an interview with an OSA patient who has used a CPAP machine for 17 years. The patient’s native language is Spanish; therefore, I document her experience using a CPAP with English features, instructions, packaging, and labeling. Additionally, I interviewed 33 DME's in California, Texas, and Florida regarding bilingual services in their stores and websites.

The secondary research I analyzed includes information from the CDC, Census, The American Journal of Respiratory and Critical Care Medicine, Sleep Medicine- U.S. National Library of Medicine, Brookings, and the American Academy of Sleep Medicine. I also included a study done by the Robert Wood Johnson Foundation focusing on language barriers for Hispanics in healthcare and a vitally important study done by the American Thoracic Society looking at the prevalence of sleep-disordered breathing in specific Hispanic communities.

3.0 Hispanic Diversity in the United States

It is common to walk through cities in the United States and hear a non-English language spoken, mainly Spanish. Diversity has been growing significantly at an elevated rate for the past 50 years in the United States, and Hispanics have been the fastest-growing minority group. The largest minority group in the United States is Hispanics which account for 18.5% of the population. The second-largest minority group, African Americans, comprise 12% of the United States population (Census, 2020).

3.1 Population

There are 61,409,170 Non-English speakers in the United States. Over half of these, or 62%, are Spanish-speaking citizens. The United States Census defines Hispanics as a person of Cuban, Mexican, Puerto Rican, Spain, and South or Central America, regardless of race (NHIS, 2015). The Hispanic population has grown 592% since 1970 compared to 56% by the overall U.S. population. In the past 30 years, it has grown from 4.5% to 18.5% (Census, 2020). The second largest minority group, African Americans, account for 12% of the population. This growing trend is expected to continue at an even faster pace. By 2040, the Hispanic population is expected to be 23% of the United States population, and by 2060 it is projected to reach 28% of the United States population. Based on the most recent Census, the highest represented Hispanic countries of origin include Mexicans (63.0%), Puerto Ricans (9.2%), Spanish (8.10%), Central Americans (7.90%),

South Americans (5.5%), Cuban (3.5%), and Dominican (2.8%). The heaviest Hispanic populated areas include the Northeast and the South, especially cities like Los Angeles, Riverside, Dallas, Houston, Miami, New York, and Chicago. The cities pinned in yellow show an increase of 2 million in the Hispanic population. The cities pinned in blue show a Hispanic population growth rate greater than 200% (Census, 2020) (Figure 1).

Figure 1: U.S. Hispanic Population Map (Brookings, 2019)

3.2 Language Barriers in Healthcare

As the Hispanic population continues to grow at an accelerated rate, we can anticipate the number of Non-English-speaking American population to increase exponentially in the coming years. However, language barriers will consequently increase as well. One in three Spanish speakers declares to speak "less than very well" English (Shin, 2003). Language barriers are an issue in their everyday lives and the area that is impacted the most is in the healthcare industry. These language barriers lead to inconsistencies in the level of care Hispanics receive. The Robert Wood Johnson Foundation (RWJF) conducted a telephone survey in Virginia to physicians,

nurses, hospital management, and pharmacists. They also interviewed 500 Hispanic adult patients of these healthcare providers. The interviewees were from areas where Hispanics make up at least 5% of the population, and this ethnic group had increased at least 75% in the previous ten years. However, this population has increased so rapidly that this area is not correctly equipped to work with Spanish speakers. The issues patients face are ongoing and range from understanding provider explanations, medical needs, recommendations, and follow-ups. The data captured from the provider and patient interviews indicates multiple problem issues stem from the same root cause (RWJF, 2002):

- 19% of Hispanics- Reported that they did not seek care when they needed it because of language barriers
- 51% of Providers- Seek assistance from personnel who speak Spanish (clerical and maintenance staff)
- 29% of Providers- Relied on patients bringing a family member with them to
- translate interactions
- 15% of Providers- Retained an outside group to provide interpreting services
- 4% of Providers- Organization provides foreign language training for their health professionals

3.3 Socioeconomic Disparities

Hispanics have a high prevalence of obesity, diabetes, alcohol use, and smoking, which are all correlated to breathing disorders. The leading cause of death in this population is heart disease. Obesity, reduced sleep duration, and sleep apnea can contribute to increased cardiovascular morbidity. Some of these health disparities are connected to low levels of education as well as high uninsured rates. In comparison to Asians, African Americans, and Non-Hispanic Whites (NHW), Hispanics have a lower rate of a bachelor's degree or more (Figure 2) and have more people under 65 without health insurance in the United States (Figure 3) (Ryan, 2016).

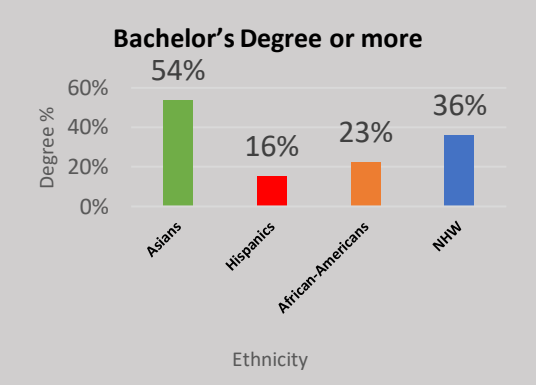

Figure 2 Bachelor's Degree or more (Ryan, 2016)

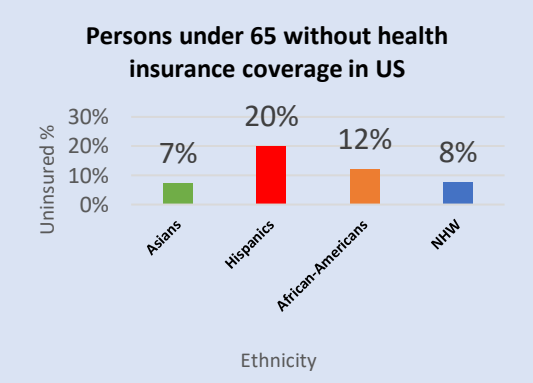

Figure 3 Health Insurance Coverage (Ryan, 2016)

4.0 COPD

4.1 COPD Background

Chronic obstructive pulmonary disease (COPD) is a life-threatening lung disease that causes shortness of breath and leads to serious illness (WHO). In 2018, 16.4 million adults in the United States were reported to have COPD. However, there is a strong belief there is a large number of underdiagnosed patients. From 2007-2010, 8.5 million adults were reported as having COPD, but data shows more than 18 million people had symptoms tied to COPD (WHO, 2017).

Many COPD cases are preventable as their major causes are tobacco smoke, indoor air pollution, dust and chemicals, and other lower respiratory infections. Historically, men have been more at risk of developing COPD. However, due to increased tobacco use by women and a higher risk of air pollution exposure, the disease affects men and women equally. The most common symptoms are exhaustion, cough, and mucous production. People with this illness also struggle with daily activities like walking, going up a flight of stairs, and other daily routines. People who experience these symptoms are diagnosed by performing a breathing test called spirometry, which evaluates how a person is breathing (WHO, 2017).

4.2 COPD Prevalence

The primary cause of COPD is smoking tobacco, and the most effective and cost-efficient remedy is smoking cessation. More than 16 million Americans live with a smoke-related condition, and 13.7% of adults 18 years or older in the United States smoke cigarettes. Men are more likely to be smokers than women; 15% of men versus 12% of women are smokers. In the United States, 14% of Hispanic men and 7% of Hispanic women smoke cigarettes (Figure 4). In comparison to African Americans and Non-Hispanic Whites, Hispanics have a slightly lower prevalence of smoking. When looking at current tobacco use in the four major United States geographic regions, the South, which has the highest Hispanic population, has the highest prevalence of smokers (CDC, 2019).

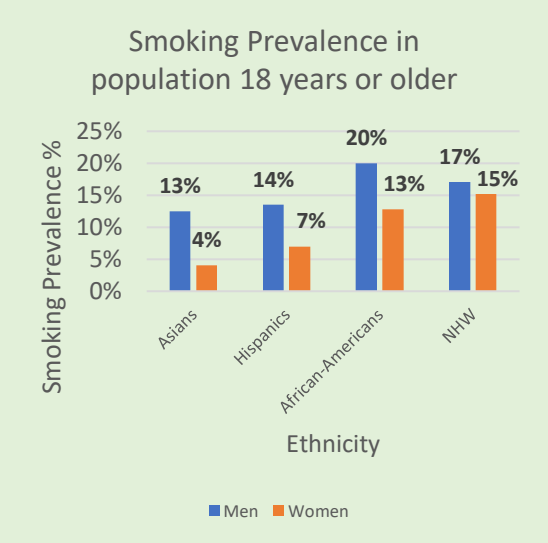

Figure 4 Smoking Prevalence (CDC, 2019)

According to a study conducted by the U.S. National Library of Medicine on adults between the ages of 40 and 79 in the United States, Hispanics have a lower COPD prevalence in comparison to African Americans and Non-Hispanic Whites (Figure 4) (Dudley, 2016). The COPD prevalence is 5.4% for Hispanics, 14.10% for African Americans, and 15% for non-Hispanic Whites. The age adjusted death rate for Non-Hispanic Whites is 1.3 times higher than in Hispanics. The numbers in this study indicate that Hispanics are less likely to be affected by COPD than other ethnic groups.

Since there are limited studies on COPD by ethnic groups, further evaluation can be done by examining Hispanics' COPD prevalence by country of origin. The countries examined include Mexico, Cuba, Puerto Rico, Chile, Colombia, and Argentina. The smoking prevalence is highest in men from Cuba at 53%, men from Chile at 40%, men from Puerto Rico at 35%, men from Argentina at 30%, and men from Mexico at 23%. COPD prevalence amongst Hispanics is 12.1% in Puerto Ricans, 7.8% in Cubans, and 5.6% in Mexicans. Mexicans and Puerto Ricans compose the most significant part of the Hispanic population in the United States at 63% and 9.20%, respectively (Diaz, 2018).

5.0 OSA

5.1 OSA Background

Obstructive Sleep Apnea (OSA) is a type of apnea that occurs when the throat muscles intermittently relax and block the airway during sleep. It causes breathing to repeatedly stop and start during sleep, most noticeably seen by snoring (Obstructive Sleep Apnea, 2019). Approximately 3 to 7% of the United States population is diagnosed with OSA (Punjabi, 2008). Research shows specific subgroups are more at risk than others as OSA prevalence is directly correlated with obesity rates. The average cost of underdiagnosed OSA in the United States was $150 billion in 2015. The primary areas where costs were incurred included workplace accidents at $6.5 billion, motor vehicle accidents at $26.2 billion, lost productivity at $86.9 billion, and comorbid diseases at $30 billion.

5.2 OSA Prevalence

The primary cause of OSA is obesity. In 2018, 42.4% of the population in the United States was 42.4%. Since 2000, the rate of obesity has increased by 12%. In 2020, the estimated costs of obesity were $147 billion, and nine states have an obesity rate of 35% or more. There is a high prevalence of obesity among adults by state and territory. Rates are higher in the Central and Southern states, a geographical area with a high Hispanic presence. When looking at obesity rates

by ethnic groups, African Americans have the highest rate, followed by Hispanics and then non-Hispanic Whites (Figure 5) (CDC, 2020).

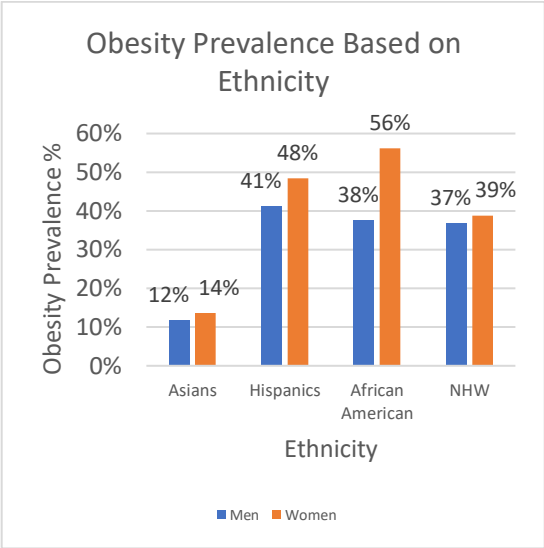

Figure 5 Obesity Prevalence (CDC, 2020)

The highest OSA prevalence in the United States is in the South and East coast, two geographical areas where the Hispanic population is most present. Eight studies looked at OSA prevalence by ethnicity. These studies were the MESA Study 1, the MrOS Sleep Study, the Sleep the Heart Health Study, the MESA Study 2, the SWAN Study, the Mihaere et al, the Kripke et al, and the Cleveland Family Study. Four of these studies included Asians, six included Hispanics, five included African Americans, and included populations of European descent. The OSA limit selection was more than 15 apnea-hypopnea index (AHI), which indicated if one has a sleep disorder and its severity—having eight studies produced different OSA prevalence rates for each ethnic group. The data indicated 15.9-45.5% of Hispanics, 16.7%-47% of African Americans, and

1.5-57% of European-decent populations had OSA (Hnin, 2018) (Figure 6). In terms of symptoms, the two most common ones in OSA patients are sleeping prevalence and daytime somnolence. These studies concluded Asians had a 43% snoring prevalence; Hispanics had a 49% snoring and 24% daytime somnolence prevalence; African Americans had a 50% snoring and 32% daytime somnolence prevalence; and people of European descent had a 36% snoring and 24% daytime somnolence prevalence (Figure 7) (Dudley, 2016). The current research shows Hispanics may have a higher sleep apnea prevalence based on snoring and daytime somnolence rates. The majority of the data gathered for this population concerning sleep apnea is derived from questionnaires or indirect measurements, which lead to inefficiencies in actual prevalence.

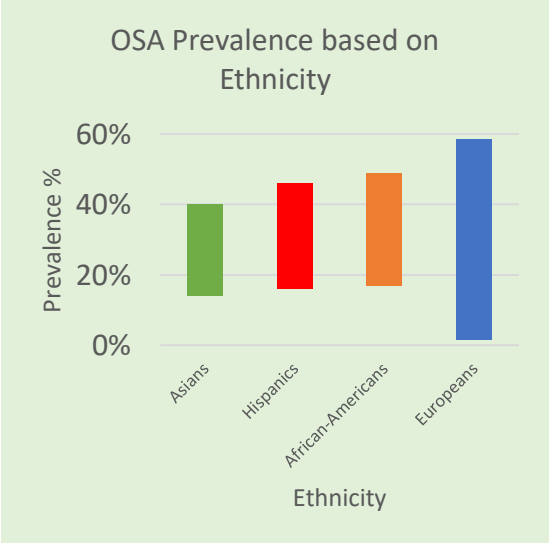

Figure 6 OSA Prevalence (Hnin, 2018)

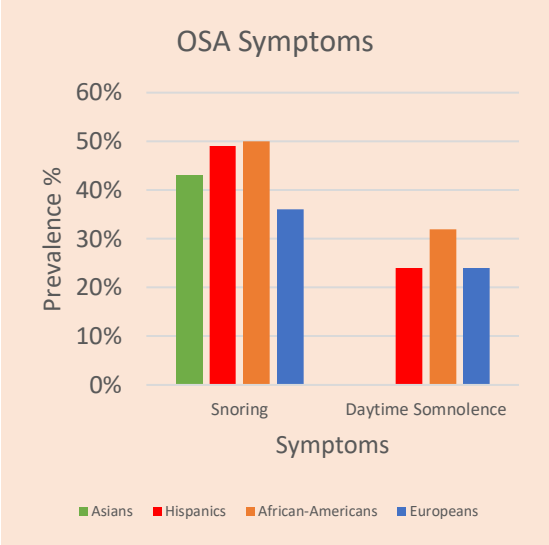

Figure 7: OSA Symptoms (Dudley, 2016)

The Hispanic Community Health Study done by the American Thoracic Society Journal quantifies the prevalence of sleep-disordered breathing (SDB) in Hispanics in the United States. The study examined 14,440 Hispanic participants from 18 to 74 years old residing in New York, Florida, and California. The study's objective was to quantify the SDB prevalence in Hispanics and determine its relationship with symptoms, risk factors, diabetes, and ethnic background. The examination included questionnaires in Spanish and English (Redline, 2013).

The study found that SDB varies by background and sex. Overall, SDB was most prevalent in men of Cuban descent with 12% and least common in Puerto Ricans with 8%. Sleep symptoms also varied by group, with the lowest prevalence of patients who stopped breathing in their sleep patients of Mexican descent. Cubans reported having the longest sleep duration, while men and women of Central American descent reported more sleepiness and shorter sleep duration. SDB is also associated with obesity, diabetes, hypertension, and an AHI of 15 or more. These conditions varied by background (Figure 8). The SDB severity was categorized in

minimal, moderate, severe, or SAS severity which varied by the patient's AHI metrics. Overall, 45.1% of patients met the criteria for SDB (Figure 9) (Redline, 2013).

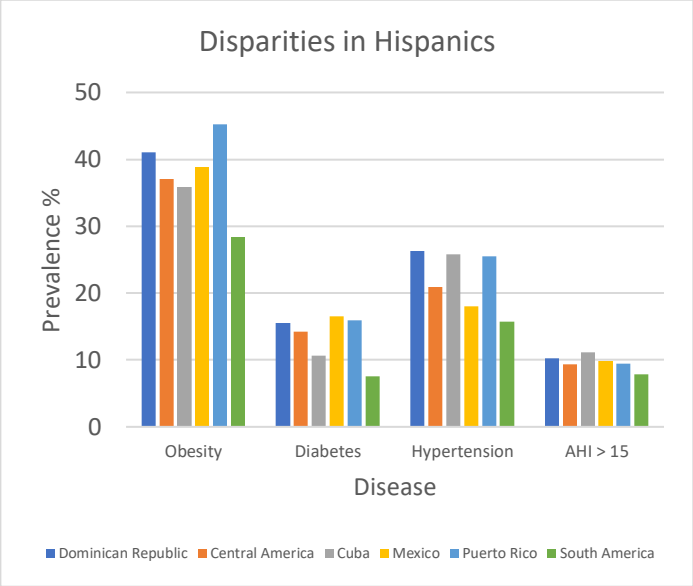

Figure 8 Disparities (Redline, 2013)

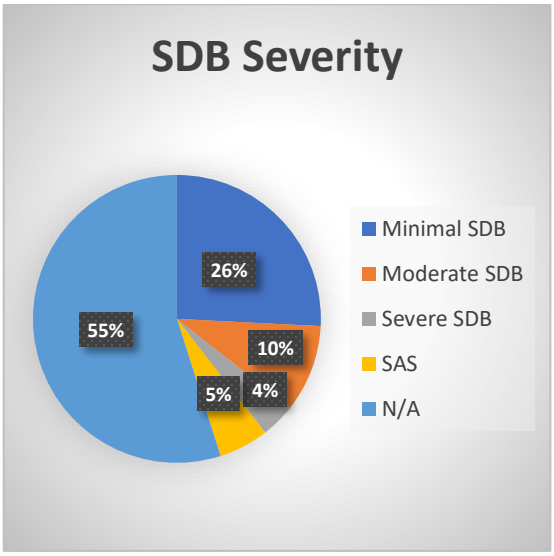

Figure 9 SDB Severity (Redline, 2013)

Previous SDB studies done in the United States have consisted of Non-Hispanic White patients. Data on Hispanics has been chiefly captured from questionnaires. Although the study found that the overall 45.1% of the population examined met the criteria for SDB, only 1.3% of them had been diagnosed by a doctor before as patients with sleep disorders. The high prevalence of SDB and the low prevalence of diagnosis suggest this population is affected by this disease. The leading cause of death in Hispanics is cardiovascular disease which is correlated to SDB. There must be better management of SDB conditions in these communities to reduce cardiovascular diseases. In conclusion, there are significant disparities in recognizing SDB in Hispanic populations in the United States (Redline, 2013).

5.3 CPAP Adherence

The most common treatment for moderate to severe sleep apnea is continuous positive airway pressure (CPAP). This machine delivers air pressure to the nose and mouth while the person is asleep. It reduces the number of respiratory apnea incidences, daytime somnolence, and snoring. There are different, adjustable mask options available for patients, such as nasal masks, nasal pillows, or face masks (Mayo Clinic, 2019). Adherence levels vary depending on health education, socioeconomic standing, and health insurance status.

According to a sleep study published by NCBI, low socioeconomic status and education lead to poorer adherence with CPAP machines. In terms of wages, 80% of Hispanics make less than $15,000 a year per capita compared to 45% of African Americans and 28% of Non-Hispanic Whites. The higher education rate of Hispanics is also lower, as 16% have a bachelor's degree or more, compared to 23% of African Americans and 36% of Non-Hispanic Whites (Diaz-Abad,

2014). Additionally, 20% of Hispanics under 65 years of age do not have health insurance, while African Americans and Non-Hispanic Whites are 12% and 8%, respectively. These disparities are correlated to poorer adherence to CPAP in Hispanics. Another root cause highlighted by NCBI is the unstable communications between Hispanics and healthcare providers, mainly because of language barriers (Dudley, 2016).

Along the same lines, a study conducted by the Hindawi Publishing Corporation confirmed Hispanics are less accepting of CPAP machines at home than Non-Hispanic Whites. This study was done on OSA patients, one-third of whom were Hispanics. 33% of these participants spoke only Spanish; 52% reported physicians communicated their result in Spanish; 71% stated the company setting up the equipment provided the service in Spanish, and 91% indicated the equipment provider made sure they explained how the CPAP works. This study's results indicate that language was not a factor that impacted the patients' CPAP adherence. Ultimately, this study proves that when patients can communicate with providers and receive a clear explanation in their native language of how CPAPs work, patients have better adherence and OSA knowledge (Diaz-Abad, 2014).

5.4 Voice of the Customer

In July 2020, I conducted an interview with an OSA patient from Puerto Rico. This patient has been diagnosed with OSA for 17 years. Her native language is Spanish, and she is able to speak and read English at a minimal level. She talked about her experience with a CPAP and described it as, “Thanks to CPAP machines I am alive today. I have three different machines that

all work tremendously. Before being diagnosed with OSA, I suffered from daytime somnolence and heavy snoring. I had multiple scary episodes with daytime somnolence because I would fall asleep everywhere including driving, at the doctor's office, or even while talking to someone else."

Despite all of the benefits CPAP has provided her, she believes the process could have been more straightforward. When using her ResMed CPAP machines after the DME set it up, she had some doubts about the device, to which she alluded back to the DME for further directions. The instructions, packaging, and device were set up in English. By developing these features in multiple languages, patients who only speak a language other than English can better understand the device. Further research about ResMed devices proved that this device had options to change the language to Spanish, Portuguese, Italian, and French. I informed the patient about these options and guided her through the process of updating the CPAP. It took 30 minutes for the patient to successfully update the language on the device, which she had no idea could be done. After all, she has been using CPAPs for 17 years and is aware of how it works, but this information could have been precious for her when she began this journey. Like this patient, many more can benefit by better communicating these services through bilingual packaging, instructions, and guides. DMEs also have to be trained to explain these features to CPAPs for patients, especially those located in areas with a high Hispanic presence.

5.5 Primary Research Observations

An essential factor in CPAP adherence in Hispanic patients is if the DME or company setting up the equipment speaks Spanish. I conducted research on DMEs in three States with the

highest percentage of the Hispanic population, California, Texas, and Florida. California has 14.4 million Hispanics, 39.4% of the state; Texas has 9.8 million Hispanics, 39.7% of the state; and Florida has 4.4 million Hispanics, 26.4% of the state. 33 DMEs were interviewed, 10 in California, 10 in Texas, and 13 in Florida. First, research was done on each DME provider's website to see if they indicated their ability to provide services in Spanish. Only one DME website communicated it could provide services in Spanish. After going through the websites, I interviewed each DME through the phone and found that 30 of these DMEs provided services in Spanish. There is a disconnect between DMEs and patients as information about their services is not communicated clearly, which led some Hispanics to hesitate to follow up with the service. DMEs can provide this information on their websites and include it in their marketing services to increase the accessibility of services to Hispanics who suffer from OSA.

6.0 Sleep and Respiratory Market

I analyzed some of the major players in sleep and respiratory medical device production regarding their bilingual initiatives in the United States. The analysis included Philips, Inogen, and ResMed. Philips Respironics is a medical supply company that focuses on products that improve respiratory functions. It provides products, services, solutions, and population health management related to sleep care. For the purposes of this study, the focus will be CPAP machines. Philips also provides products and services for breathing and respiratory care patients. Another top provider of sleep apnea equipment I analyzed is ResMed, which focuses on producing CPAP machines. The third company I researched is Inogen, which focuses on portable oxygen concentrators that provide long-term oxygen therapy at a lower cost for patients with breathing and respiratory complications. The initiatives I analyzed for each company include packaging, instructions, website, and supplementary online guides advertised in the United States in more than one language.

6.1 Philips, ResMed, Inogen

The Philips website provides sleep and respiratory information in 19 different languages depending on the buyer's location. For instance, if the patient is in Spain, there is therapy, travel information, customer service, masks, and other machines detailed in Spanish. However, the products are presented in the country’s main language only. For instance, a customer in the United States can access the product information solely in English. Additionally, the instructions and

packaging for CPAP machines are in English. The DreamStation CPAP machine has a screen language option for patients to choose between 7 languages.

The ResMed website is similar to Philips', providing 11 languages for treatment solutions, risks, and multiple masks and machines. The Escape II CPAP has a language option as well with eight languages. ResMed also provides a multilingual manual for the AirSense 10 CPAP machine that details the use of the device.

Inogen provides a multilingual manual, as well, for the Inogen One G3 and G4 in English, French, Italian, Portuguese, and Dutch. This guide has a description of the oxygen concentrator, operating instructions, maintenance, and system specifications.

7.0 Recommendations

After analyzing the current initiatives done by sleep and respiratory companies, it is vital to highlight additional efforts that can be implemented. These companies' initiatives are a significant step in providing the necessary sleep and respiratory information for patients whose native language is other than English. A thorough analysis on multiple additions will be proposed to potentially increase the accessibility of information to patients and ultimately lead to more saved lives.

7.1 Spanish Language Website & Call Center

A joint initiative in marketing healthcare services to Hispanics is providing a Spanish language website. Most of these websites include an “En Español" option from their general company website. The three sleep and respiratory companies examined have the option to choose the country from where the customer is ordering the product, which is provided in the native language. However, for the United States products, the only language available in English. Allowing the customer to choose the language of preference regardless of their market will allow patients who speak other languages to better understand products. The Spanish language website should not just be a translation from the English website. It also should use Latin American Spanish words that most patients in the United States will understand. Some studies show 61% of Hispanics are using the internet for shopping and looking for information (McGavock). This website can be seen as a marketing communication tool to attract Hispanics to its products and differentiate

companies from competitors. The Spanish language websites also have to make them feel included. Companies should provide pictures of Hispanic families interacting with the products. Some of the current websites only portray non-Hispanic whites.

Along the same lines, sleep and respiratory companies should have a bilingual customer service option for customers in the United States. This service is essential for companies since, many times, it is the first point of contact between the customer and the organization. Companies must have Spanish language capabilities to orient patients on products and services. Older Hispanic patients who exhibit significant challenges speaking English are less likely to seek help directly if they are not able to communicate in Spanish. They often use translators through family members, but some prefer to seek the information themselves rather than relying on another person. Also, if they use a child interpreter, there are issues of exposing the child to information that may confuse or harm them. This service is also an excellent way to compile customer information in a database to better understand the patient population using these services.

7.2 Language Option in Products

Sleep and respiratory products that have the option to change language should indicate such features on their website information. Two OSA patients that owned ResMed CPAP machines and spoke Spanish as their native language did not know their device had the option to be set up in a language other than English. Both patients are older in age, which made the process of changing the setting more difficult. It took them approximately half an hour to update the settings on the CPAP. They also have been OSA patients for more than ten years and know the equipment

operates. It would have been more helpful to get this information as they began the process and started learning about the essence of the device.

7.3 Packaging and Labeling

Another opportunity to improve companies in the sleep and respiratory device manufacturing market is producing the equipment labeling and packaging in the United States in more than one language. This initiative will help target the 61.7 million people in America who speak a language other than English. Currently, Philips produces other products outside of the sleep and respiratory market in other languages. For example, air fryers sold in the United States have the packaging information in English, Spanish, and French. Instructions are also made in these languages. This same initiative can be transferred to sleep and respiratory products. Another important supplement to patients is the instructions manual provided online by Inogen and ResMed. This type of guide should be created for all products. Many times, patients lose the instructions and allude to the internet for information about how the device works.

7.4 Education for Hispanic patients

Based on the increasing aging population, smoking prevalence, and high diabetic rates, the Hispanic population is on pace to continue being a population prone to sleep and respiratory conditions. However, many Hispanic patients are not aware of COPD or OSA until their physician

diagnoses them. To decrease the severe prevalence of sleep and respiratory conditions, there has to be better patient education methods for Hispanic patients. Sleep and respiratory organizations can target Hispanics through social media, radio, and television.

In addition to using Spanish media outlets as education methods for sleep and respiratory patients, organizations can also implement cultural marketing campaigns. Translating advertisements from English to Spanish is not enough to reach the Hispanic market. Marketing messages have to be tailored to be culturally specific. For instance, the Hispanic population considers pricing, security, the reputation of the organization, and product import. Therefore, sleep and respiratory companies have to emphasize these areas in their messaging. Understanding the target audience is essential to being able to reach this population successfully.

7.5 Location

Hispanics are spread out throughout the United States and are primarily located on the South, East, and West coasts. Sleep and respiratory companies can focus their Spanish language marketing efforts in the cities with the most Hispanic presence. Some of these cities include:

- Chicago
- Los Angeles
- Miami
- New York City
- San Antonio
- San Diego

- San Francisco

By concentrating in these locations, sleep and respiratory companies can maximize their efforts to reach Hispanic patients. However, as the Hispanic populations continue to grow and sparse around the United States, other cities are experiencing exponential growth in Hispanic presence. For instance, cities like Pittsburgh and Cincinnati have a Hispanic population of approximately 12 million people each (United States Census Bureau, 2019). Therefore, the focus should start in the most agglomerated geographical locations and continue expanding throughout other cities.

8.0 Conclusion

The Hispanic population has been the fastest-growing minority group in the United States in the past 50 years, as it has increased by 592%. According to United States Census, by 2040, the Hispanic population is expected to grow from 17% to 23% of the United States population. As this ethnic group continues to grow, there need to be inclusive measures implemented by organizations in the healthcare industry. Providing clear, accessible information can ultimately reduce health disparities in the Hispanic population in the United States, such as high rates of obesity, cardiovascular diseases, and respiratory diseases.

The data I analyzed presents evidence of the high prevalence of COPD and OSA in the Hispanic population. The main drivers of sleep and respiratory illness prevalence are high rates of tobacco smoking and obesity. The prevalence of tobacco smoking and obesity in the Hispanic population leads them to be a high-risk population for sleep and respiratory illnesses. There is limited data evaluating how the prevalence of sleep and respiratory illnesses differ by ethnicity. However, a study conducted by NCBI concluded the COPD prevalence is 5.4% of the Hispanic population, 14.10% in the African American population, and 15% in the non-Hispanic White population.

Further analysis of COPD prevalence by Hispanic countries of origin highlights certain groups like Puerto Ricans, Cubans, and Mexicans have a prevalence of 12.1%, 7.8%, and 5.6%, respectively. These three groups are also the three most common among Hispanics in the United States. Despite the limited data regarding COPD prevalence by ethnicity, the data analyzed by

country of origin indicates COPD in Hispanics has to be addressed by having more studies conducted.

Along the same lines, there is limited data on OSA prevalence by ethnicity. Eight interethnic studies provided different prevalence rates for each group. The ranges include 15.945.5% of Hispanics, 16.7%-47% of African Americans, and 1.5-57% of European-decent populations had OSA. Additional data shows Hispanics have a high prevalence of snoring and daytime somnolence. According to a study conducted by the American Thoracic Society Journal on Hispanics, 45.1% of patients met the criteria for Sleep Disordered Breathing, while 1.3% had been diagnosed by their physician. In addition to underdiagnosis in Hispanics, studies suggest this group has lower levels of adherence to CPAPs in comparison to other ethnic groups.

After performing a thorough analysis of the tools provided by the sleep and respiratory companies, it is evident there have to be more inclusive measures for Hispanics. Currently, some of the information offered by these organizations include Spanish language websites to customers outside of the United States, language options on their products, and a multilingual guide. Potential improvements and additions include having a Spanish language website and call center for all patients, including the ones in the United States. Another improvement is providing information on the website about language options on devices. Additionally, organizations should produce the packaging and labeling of each product in Spanish. Major players in this industry can also provide education to Hispanic customers through media outlets. Finally, organizations can focus their efforts on locations where Hispanic are most present.

The main reasons for sleep and respiratory disparities in the Hispanic community include lack of Spanish language information, low patient education, insufficient case study data, poor CPAP adherence, and underdiagnosis. In the short term, sleep and respiratory companies can take

the next step by implementing initiatives such as the ones presented. In the long term, the United States healthcare system can develop educational material to induce smoking cessation, reduce obesity rates, and increase the number of insured Hispanic patients. Ultimately, inclusion will lead to healthier patients, lower healthcare costs, and larger customer bases for sleep and respiratory organizations.

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