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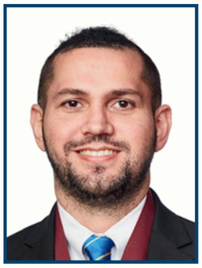

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Empowering Hispanic Communities through Action, Community Involvement and Public Health

By **Nora Esteban-Cruciani**, MD, MS, FAAP; JNHMA Editorial Board

This fourth issue of the Journal of the National Hispanic Medical Association reflects the collective effort of “unsung heroes” nationwide, working to empower Hispanic individuals and populations to take control of their health and well-being through community involvement and culturally relevant approaches.

As a pediatrician leading a perinatal newborn section, I witness daily—beyond just the statistics—how rapidly the Hispanic population is growing, making it increasingly urgent for all of us to advocate for and address the unique public health challenges they face.

This collection of articles highlights crucial areas of focus—voting rights, social media engagement, health fairs, unique case discussions, cancer treatment adherence, and representation in medical education—all of which intersect to empower the Hispanic communities and improve overall population health.

The importance of civic engagement, particularly voting, is underscored in Alvarez's article, which emphasizes the barriers Latino medical professionals encounter. These obstacles not only affect their civic participation but also hinder efforts to advocate for policies that promote health equity. By providing tangible solutions to reduce these barriers, we can enhance the collective voice of healthcare professionals dedicated to serving Hispanic population.

In an age where misinformation can rapidly spread, Gonzalez-Arias advocates for leveraging social media to combat health disparities related to diabetes and obesity among Latinos. Culturally sensitive health promotion through these platforms can empower individuals to make informed choices, but it is essential to address access disparities. Collaboration among healthcare providers and public health officials is vital to ensuring these efforts are effective and equitable.

Khurana's study on health fairs reveals the power of community-driven initiatives in understanding and addressing the barriers faced by the Hispanic population in Metro Detroit. The high prevalence of chronic conditions and the significant barriers to care—such as lack of insurance and language challenges—highlight the necessity for targeted interventions. Health fairs not only provide critical health services but also foster community engagement and empowerment, serving as a model for similar initiatives nationwide.

The experiences of Hispanic breast cancer survivors, as explored by Granda-Cameron, underscore the complexities surrounding treatment adherence. The qualitative insights reveal significant gaps in patient education and communication, particularly for Spanish-speaking patients. Culturally competent care, characterized by trust and understanding is crucial for improving adherence to endocrine blocking therapy and ultimately enhancing survival rates in this vulnerable group.

Moreover, the representation of Hispanic faculty in medical schools, as reported by Romero, raises concerns about the disparities in academic medicine. Despite a growing Hispanic population, faculty representation has increased only marginally over the past 50 years. Today, Hispanics make up just 3.2% of medical faculty, with even fewer in senior positions. This underrepresentation perpetuates a cycle of inequity, limiting mentorship opportunities and affecting the cultural competence of future healthcare providers.

Finally, Solano's exploration of artificial intelligence in clinical practice highlights the potential for technology to improve patient care, especially within Spanish-speaking populations. While AI tools can alleviate some administrative burdens, careful consideration of their implementation is necessary to ensure they meet the needs of diverse patient demographics.

Together, these articles illuminate a pathway toward a more equitable public health landscape for Hispanic communities. By overcoming barriers to voting, harnessing the power of social media, fostering community engagement, ensuring culturally competent care, and promoting diversity in medical education, we can create a more responsive and empowered healthcare system. The goal is clear: to enhance the health and well-being of Hispanic populations, decrease disparities, and promote health equity for all.

From the Clinic to the Polls: Why Voting Matters for Latino Medical Professionals

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ABSTRACT

There is a well-established connection between voting and health as referenced by the American Medical Association (American Medical Association n.d.). However, the Latino electorate continues to face suppression, a challenge that also affects Latino medical professionals and students. Latino medical professionals are a critical part of the healthcare delivery system, often serving patients who share their ethnicity (Hutchinson, Davis, & Mulligan, 2010). Latino medical professionals play a crucial role in representing the needs of the Latino community, not only in healthcare delivery but also in shaping policy decisions that impact the health of their communities.

In this article, the authors highlight the persistent barriers to voting faced by Latino medical professionals and their impacts on community health. The authors offer tangible solutions, which aim to reduce voting barriers and promote civic health within the Latino medical community, emphasizing the importance of safeguarding policies that provide time off to vote.

Keywords: *Voting and health, Latino electorate, Civic engagement, Latino medical professionals, Civic health*

Voting is not only a fundamental democratic right but also a critical determinant of community health and well-being (Nelson, Sloan, & Chandra, 2019). For Latino medical professionals, who often serve our own (Latino) communities (Hutchinson, Davis, & Mulligan, 2010). The ability to vote is essential in advocating for policies that address health disparities and improve our communities' health outcomes. Despite this, the Latino vote continues to face suppression, a challenge that extends to our medical colleagues and students.

The impacts are profound and undeniable. Latino communities in the United States bear the heavy burden of healthcare disparities, perpetuating a cycle of limited access to quality care and negative health outcomes. The stark reality is painted by statistics revealing higher rates of chronic conditions like diabetes and hypertension (Pew Research Center, 2008). coupled with low insurance rates leading to reduced access to preventive services and timely medical interventions (Kaiser Family Foundation, 2023). Our community's well-being often falls behind, caught in systemic barriers within our health institutions compounded by disenfranchisement in electoral processes – ***issues that can be addressed when all members of our community vote.***

As the second-largest group of voting-age Americans (Pew Research Center, 2024), Latinos wield significant influence in elections (Voto Latino, n.d.) – but in the 2020 U.S. Presidential Election, only 53.7% turned out to vote (Krogstad & Noe-Bustamante, 2020). With an expected 17.5 million Latino voters casting ballots in 2024, and a quarter of them participating for the first time in a presidential election, our collective impact cannot be overstated (Hutchinson, Davis, & Mulligan, 2010).

Evidence indicates that Latino voters frequently face significant barriers at the polls, such as longer wait times, stringent voter ID laws, and fewer polling locations per capita compared to white voters (Brennan Center for Justice, n.d.) In the 2018 election, 9% of Latino voters were informed that they lacked the proper identification to vote, while only 3% of white voters reported the same issue(Vij, 2020). Additionally, studies have shown that Latino voters, on average, experience a 46% longer wait time at polling stations compared to their white counterparts (American Civil Liberties Union, n.d.; American Public Health Association, 2023).

These barriers do not spare the medical community. Medical students and physicians face unique hurdles that hinder their voting participation, exacerbated by demanding schedules and logistical complexities (American Medical Association, 2023). These challenges include obtaining identification documents, language barriers, transportation issues, and limited polling hours. For medical professionals, long working hours often overlap with polling times and frequent relocations for medical training can make participation even more challenging (UCSF School of Medicine, 2022).

A solution is needed and Latino Medical Students are paving the way. Notably, The Latino Medical Student Association's (LMSA) Resolution 03-2024, "Affirming Voting as a Healthcare Right and Promoting Civic Engagement Among Medical Students," emphasizes voting as a healthcare right and a pillar of democracy and offers solutions. LMSA proposes comprehensive resolutions to address this challenge, including drafting policy statements, partnering with organizations for voter registration, organizing drives, advocating for protected voting time, and promoting voter education initiatives(Latino Medical Student Association, 2024).

Addressing these issues can start with initiatives like protected voting time but can expand to voter registrations within our health institutions and patient interactions. Nonpartisan efforts from organizations like Vot-ER make it easy to boost political efficacy (Pew Research Center, 2015) and civic health at-large. By promoting civic engagement and ensuring that our eligible colleagues can vote without barriers, we can begin to dismantle the systemic inequities that perpetuate poor health outcomes **ensuring** ***that the voices and needs of the Latino community are heard and addressed.***

With over 350 institutional partnerships, 700 participating sites, and 50,000 medical professionals taking action inside their healthcare centers and clinics with Vot-ER, there is a growing movement dedicated to uplifting our communities' voices in shaping local, state, & federal health policy, through the power of our vote. This vital work starts with each of us.

Health is always on the ballot and the 2024 election offers a significant opportunity for Latinos to have a say. Guaranteeing protected time for Latino medical professionals and students to cast their votes isn't solely an issue of equity; it's a fundamental step in empowering our future healthcare leaders to advocate for policies that align with the needs of our communities.

Let's unite in ensuring every voice is heard this election year and beyond. Together, we can empower the voices of our Latino colleagues and students, forging a path towards healthier communities.

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Content is Life: The Power of Social Media to Improve Health among Latinos.

By **Mauricio Gonzalez-Arias**, MD

ABSTRACT

The Latino communities in the United States have grown substantially, comprising approximately 19% of the total population in 2021. Despite this demographic shift, disparities persist in healthcare access and outcomes within the Hispanic communities, influenced by cultural differences, language barriers, and structural inequalities. The prevalence of type 2 diabetes among Hispanics in the United States is notably significant, with epidemiological studies revealing a higher prevalence compared to non-Hispanic whites. Furthermore, obesity, recognized as a significant epidemic in the United States, poses a considerable risk factor for type 2 diabetes among Hispanics, with a higher prevalence observed compared to non-Hispanic whites. The association among obesity, type 2 diabetes, and various health outcomes underscores the critical role of behavioral interventions in disease prevention.

Keywords: *Latinos, prevention, obesity, type 2 diabetes, social media, public health strategies, cost-effective*

Social media platforms have emerged as potent tools for health promotion and education within the Latino communities. With a sichble portion of Hispanics engaging with social media platforms daily, these platforms offer a means to disseminate evidence-based information, combat misinformation, and promote healthy behaviors. Leveraging social media interventions has shown promising results in positively influencing behaviors related to lifestyle modifications and metabolic indicators of chronic diseases among vulnerable populations. Integrating social media into public health strategies holds promise for addressing healthcare disparities and fostering health equity among Latinos. By harnessing the potential of social media platforms, healthcare professionals can enhance outreach efforts, improve healthcare access, and empower individuals to make informed decisions about their health. However, effective implementation requires cultural sensitivity, authenticity, and a deep understanding of the diverse needs and preferences within the Hispanic community.

This article delves into the confluence of social determinants of health, healthcare accessibility, and the prevalence of chronic diseases among the diverse Latino population, with a specific emphasis on type 2 diabetes and obesity. Furthermore, it scrutinizes the potential efficacy of social media platforms in mitigating the prevalence of these aforementioned health conditions. The author also provides insights into his experiences crafting educational content and underscores its significance in addressing health disparities within the Latino community. Lastly, rigorous assessment of social media interventions is imperative for enhancing strategies and optimizing their effectiveness in disease prevention and health promotion initiatives targeted towards this demographic cohort.

1. How many Latinos live in the USA?

Latinos are the second largest minority in the USA. One can argue that the term ‘minority’ no longer applies. There were 62.5 million Latinos in the United States in 2021, accounting for approximately 19% of the total U.S. population. In 1980, the population was only 14.8 million, and Hispanics comprised just 7% of the total U.S. population. Although

72% of Latinos are proficient in English overall, there are striking differences between foreign-born and US-born, the latter being 38% and the former 91%[1]. This is important because we need to know how to target different population segments based on metrics to create impactful public health campaigns.

2. What is Latinos' experience in healthcare?

Given the cultural differences and language barriers, Latinos experience healthcare differently than non-Hispanic whites. Hispanic adults are less likely than other Americans to have seen a health care provider recently and to have a primary care provider. Seven in ten say they have seen a doctor or other health care provider in the past year, compared with 82% among Americans overall. They are less likely to have health insurance, and many of the adverse outcomes they experience are due to structural and work-related causes. At least forty percent of Hispanic adults identify communication challenges stemming from language or cultural disparities and preexisting medical conditions as significant contributing factors[2]. 35% of Hispanic adults strongly or moderately prefer consulting a Spanish-speaking physician or healthcare provider for regular medical appointments. A more significant proportion (51%) indicated indifference regarding the language proficiency of their healthcare provider, while 13% expressed a preference against seeing a Spanish-speaking healthcare professional. Comparable sentiments are observed regarding the preference for consulting a Hispanic healthcare provider, with one-third of Hispanic adults expressing a preference for such professionals, 59% exhibiting indifference, and 7% expressing a preference against consulting Hispanic healthcare providers.

Despite Hispanic Americans comprising 19% of the total U.S. population, only 9% of healthcare practitioners and technicians nationwide are Hispanic, per a 2021 Pew Research Center analysis of federal government data. Furthermore, only 7% of all physicians and surgeons and 7% of registered nurses in the United States identify as Hispanic[2]. Health status is influenced by myriad factors extending beyond conventional healthcare contexts. These encompass the spectrum of social determinants of health (SDH), from housing conditions and nutritional accessibility to educational opportunities. Scholarly discourse has posited that racial and ethnic minority groups contend with unfavorable social determinants of health, which in turn contribute to their diminished access to healthcare services. Disparities persist in healthcare treatment and outcomes among minority populations, even after adjustments for socioeconomic variables[3]. For instance, individuals within the Spanish-speaking Latino demographic exhibit a lower propensity compared to Caucasians to engage with healthcare services, including consultations with physicians or mental health professionals, as well as the receipt of preventative care measures such as mammography screenings or influenza vaccinations. These behaviors can inevitably lead to worse outcomes[4].

3. What are the most prevalent conditions for Latinos in the USA that can be prevented with education?

To this reduction in healthcare access, we must add the accelerating factor that Hispanics are more prone to develop type 2 diabetes at an earlier age. Moreover, it is also known that similar trends are documented for hypertension and obesity. This 'disastrous triad' causes great suffering within the Latino community[5, 6].

The prevalence of type 2 diabetes among Hispanics in the United States is notably significant. According to recent epidemiological studies, Hispanics exhibit a higher prevalence of type 2 diabetes compared to non-Hispanic whites. Research conducted by the Centers for Disease Control and Prevention (CDC) indicates that approximately 12.5% of Hispanic adults in the United States have been diagnosed with type 2 diabetes. This prevalence is notably higher than that observed in non-Hispanic white adults, where the prevalence stands at approximately 7.5%[7].

Similarly, data from the National Health and Nutrition Examination Survey (NHANES) corroborates these findings, suggesting a disproportionately higher prevalence of type 2 diabetes among Hispanic adults in the United States[8]. In the demographic of adults of Hispanic descent, individuals of Mexican origin exhibited the highest prevalence of type

2 diabetes at 14.4%, followed by those of Puerto Rican descent at 12.4%. Central and South Americans displayed a prevalence of 8.3%, while individuals of Cuban descent demonstrated 6.5%.

Education significantly influences the development of type 2 diabetes, with a discernible inverse relationship between educational attainment and the prevalence of diabetes. Research has suggested that individuals with lower levels of education exhibit a higher incidence of diabetes compared to those with higher academic qualifications. For instance, among adults with less than a high school diploma, approximately fifteen percent are diagnosed with diabetes, whereas only seven percent of individuals possessing a bachelor's degree or higher are affected by the condition[9]. However, it is important to note that correlation does not imply causation; various other social, economic, and health-related factors may also contribute to this observed relationship.

Moreover, data from 2017 underscores a notable discrepancy in educational attainment between Hispanic and non-Hispanic white (NHW) populations. Specifically, 72% of Hispanics attained a high school education or higher, contrasting with a higher proportion of 93.3% among NHWs. Similarly, a smaller percentage of Hispanics, approximately 15.3%, attained a bachelor's degree or higher compared to 35.6% of NHWs[10].

Obesity is recognized as a significant epidemic in the United States and stands as one of the most consequential modifiable risk factors in the prevention of type 2 diabetes[11]. Among various demographic groups, Hispanics exhibit a higher prevalence of obesity in comparison to NHW. The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) further elucidates this relationship, revealing a linear correlation between body mass index (BMI) and the prevalence of diabetes. Specifically, individuals with a BMI below 25 exhibited a diabetes prevalence of 9.8%, while those classified as overweight (BMI 25–29) had a prevalence of 14.25%. Notably, obese individuals (BMI > 29) displayed the highest prevalence of diabetes, reaching 22.4%[12].

The association among obesity, type 2 diabetes, and various health outcomes shares a common etiology rooted in a robust behavioral component, whereby educational interventions can significantly influence the onset of risk factors associated with these metabolic conditions. One critical aspect of disease prevention is education. Furthermore, this bears even more importance concerning obesity, diabetes, and hypertension as they are considered conditions with vital behavioral components around nutrition, exercise, alcohol consumption, and medication adherence. However, to improve meaningful clinical outcomes, we must close the intention-behavior gap to successfully educate and induce positive behavior changes. The concept of the intention-behavior gap denotes the contradiction between an individual's intentions and subsequent actions. The likelihood of an individual translating their intentions into action may be influenced by various internal factors, such as beliefs, skills, and knowledge, as well as external factors, such as time, financial resources, and social support.

Comprehending the intention-behavior gap holds significance for healthcare professionals as it provides insights into patients' challenges when modifying their behaviors. This understanding facilitates the implementation of tailored strategies to address such obstacles and enhance adherence to a healthier lifestyle[13]. Unfortunately, this requires time and a multi-component team, which are only sometimes available outside clinical trials and academic centers. This highlights the potential for delivering medical education through social media, while also acknowledging the risks of misinformation and the challenge of ensuring content accuracy and credibility.

4. **In what ways can we utilize social media platforms to disseminate educational resources effectively within the Latino community, aiming to mitigate the incidence of chronic degenerative diseases?**

The author of this manuscript has leveraged social media platforms intensively over the past five years, reaching millions of people every month. This can be attributed to several key strategies: consistent posting schedules that keep the audience engaged and informed, active social listening to identify and address common public health problems and emerging trends, and professional yet approachable language. By tailoring content to suit individuals from diverse backgrounds and varying literacy levels, the author ensures that complex health information is accessible and comprehensible to a broad audience. It is important to mention that this undertaking is time-consuming, and it is currently unclear if healthcare professionals with a busy schedule could reproduce this.

One positive aspect of social media is the number of people actively engaging and consuming information on various platforms. As per recent research, a sizable number of Latinos stroll social media daily. In the U.S., as indicated by Pew Research findings, YouTube emerged as the predominant online platform. Approximately eighty-three percent of U.S. adults acknowledge having utilized this video-based platform at some point. Moreover, although to a somewhat lesser extent, Facebook maintains a substantial presence within the online domain, with a significant majority of Americans (68%) reporting their engagement with this social media platform. Furthermore, nearly half of U.S. adults (47%) indicate their usage of Instagram.

Approximately sixty percent of Hispanic adults and fifty-seven percent of Asian adults acknowledge their utilization of Instagram, surpassing the corresponding shares among Black adults (46%) and White adults (43%). Notably, Hispanic adults exhibit a pronounced inclination towards using TikTok, with nearly half (49%) indicating their engagement with the platform, a figure exceeding that reported by Black adults (39%). Moreover, relatively minor proportions of Asian (29%) and White (28%) adults profess to use TikTok. Furthermore, fifty-four percent of Hispanic adults and fifty-one percent of Asian adults report their usage of WhatsApp. In contrast, only thirty-one percent of Black adults and even fewer White adults (20%) convey similar engagement with the platform[14].

These notable figures serve as compelling indicators of the considerable potential for leveraging social media platforms in the context of public health engagement. These trends led the World Health Organization (WHO) to initiate the global eHealth strategy to foster promoting, advancing, and assessing initiatives encompassing these platforms[15]. Social media platforms have the potential to facilitate the promotion of healthy behaviors, which constitute the cornerstone for disease prevention for type 2 diabetes and obesity.

5. How can we effectively reach out to members of the Hispanic communities?

People of different ethnicities require a sense of familiarity and connection to consume information, which can easily be found on social media or streaming platforms. From a consumer perspective, as studied by Nielsen, the efficacy of engaging Hispanic communities hinges upon comprehending the intricate nuances within this diverse array of cultures. Cultural resonance, authenticity, and inclusivity are the cornerstones of fruitful interactions. Establishing trust requires deep insight into the community members and institutions prioritizing understanding yields the greatest impact, according to Nielsen's statistics[16]. While social media is considered acceptable and valid for various audiences and holds promise in promoting health equity among disadvantaged populations such as low-income, rural, and older adults, there is still inconsistent empirical evidence regarding its effectiveness in improving public health outcomes.

The COVID-19 pandemic highlighted the negative impact of social media, as it led to the widespread dissemination of misinformation, also known as an "infodemic." This false information significantly affected public attitudes and behaviors towards the virus and vaccines, contributing to vaccine hesitancy and refusal. The spread of misinformation worsened the pandemic by increasing the number of unvaccinated individuals. Factors such as cultural influences, high demand for information, ease of dissemination through social networks, and inadequate legal oversight have all contributed to this problem[17, 18]. Acknowledging the challenges and issues associated with using social media, such as managing misinformation and disinformation, and ensuring compliance with user privacy protections, is essential. Also, by focusing on social media platforms as the main communications channel, there's a risk that this action could restrict access to health information for those who are not connected through technology. Policymakers should establish clear guidelines to ensure best practices and measure the pros and cons of public health campaigns dispersed through social media[19].

To fully harness the potential of social media in enhancing public health, it is important to effectively utilize these technological tools to develop scalable, culturally tailored health promotion programs and campaigns. Recently, the author, in conjunction with the American Heart Association, published a short video on Instagram explaining the new acronym RAPIDO (*rostro caído, alteración del equilibrio, pérdida de fuerza en un brazo, impedimento visual, dificultad para hablar, y obtener ayuda rápido),* which describes common stroke symptoms for early detection in Spanish. Only 58% of Hispanic adults residing in the United States demonstrate the ability to identify signs of stroke, a lower proportion compared to 64% among Black adults and 71% among white adults[20]. Stroke ranks as the fifth-leading cause of mortality in the United States. Notably, it stands as the third-leading cause of death for Hispanic women and the fourth-leading cause for Hispanic men.

The RAPIDO campaign is the first time the AHA has conducted such a social media campaign to reach Latino communities. In conjunction, we were fortunate to have half a million plays, 3,300 shares, and an overall reach of 370,169 people, all with a 70-second video. This illustrates the potential of judicious social media utilization to expedite the distribution of evidence-based information. The fact that this video was shared more than 3,000 times reflects the need of Latinos to engage in meaningful medical education.

However, behavior change is more important than views and reach. Luckily, social media interventions have been proven to positively influence behaviors for better lifestyles and metabolic indicators of diseases such as obesity and type 2 diabetes. These low-cost, user-friendly interventions can reduce the burden of the abovementioned conditions by helping people increase their physical activity levels and reduce their sugar and saturated fat intake. They can also strengthen health professionals' counseling, empower patients to learn about their conditions, and promote equity in healthcare services. These interventions have succeeded in vulnerable populations, including low-income sectors, rural areas, and minority ethnic groups[21]. An examination of the evidence revealed that social media strategies targeting behavior improvement are linked to reduced glycosylated hemoglobin levels and enhanced quality of life.[22]

In the year 2022, renowned actor Ryan Reynolds consented to document his colonoscopy procedure after losing a wager with his associate and business partner, Rob McElhenney. During the procedure, a polyp was discovered and subsequently excised. The dissemination of Reynolds' video served to raise awareness among millions of individuals [23]. Given that colonoscopy, as a preventive measure, is associated with a 52% reduction in the relative risk of developing colon cancer and a 62% decrease in the risk of mortality attributable to the disease, such publicity holds significant value[24]. This is particularly pertinent for colon cancer, which ranks as the second leading cause of cancer-related deaths in the United States[25].

It is important to acknowledge as mentioned before, that social media can also contribute to the spread of misinformation. In a study that analyzed 10,233 discussions related to statin usage, an artificial intelligence pipeline was used to categorize the conversations into 100 topics across six thematic clusters. These clusters included discussions on ketogenic diets, diabetes, supplements, and statins; adverse effects of statin usage; hesitancy towards statin therapy; evaluations of clinical trials; potential biases within the pharmaceutical industry regarding statins; and discussions about red yeast rice and statin therapy. The study found that a majority of these discussions conveyed either a neutral (66%) or negative (33%) sentiment. This is concerning as 33% negative sentiment towards an important medication like statins is substantial[26].

Throughout the pandemic, our society grappled with dual adversaries: the coronavirus itself and the pervasive spread of misinformation, termed the "infodemic" by Dr. Thedros, the Director-General of the World Health Organization. A comprehensive study undertook the examination of myriad sources disseminating misinformation pertaining to fundamental viral concepts, preventive measures, treatment modalities, and vaccine-related information. The investigation revealed that social media emerged as the predominant conduit for disseminating misinformation on these critical topics[27].

Conclusion

In light of the growing Latino population and persistent health disparities, leveraging social media for health promotion is essential. These platforms offer a cost-effective way to engage Latino communities, disseminate vital health information, and foster behavioral changes to combat type 2 diabetes and obesity. Culturally sensitive, evidence-based content can empower individuals to make informed health decisions and promote health equity. However, addressing challenges like misinformation and access disparities is crucial, necessitating collaboration among healthcare providers and public health officials. By prioritizing education and engagement, we can harness social media's potential to drive meaningful change and improve health outcomes for the Latino community.

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Disclaimer: The views expressed in this paper are those of the authors and not necessarily of the authors' organizations or the National Hispanic Medical Association (NHMA). The paper is intended to help inform and stimulate discussion. It is not a report of NHMA.

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Use of a Health Fair to Promote Health Equity of the Hispanic Community in Metro Detroit

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ABSTRACT

This study analyzes the demographics, general health characteristics, and barriers to healthcareof the Metro Detroit Hispanic community through a health fair survey. Data was collected using a descriptive, 25-question self-reported survey in English and Spanish administered to 19 health fair attendees. Of total respondents, 92% identified as Hispanic and 76% Spanish-speaking.

Descriptive analysis was conducted on several variables, including prevalence of medical conditions, health behaviors, and barriers to care. Participants reported a high prevalence of serious chronic conditions including diabetes (29%) and hypertension (29%). Significant barriers included a lack of medical insurance (72%), no primary care physician (67%), and language (24%). Other notable barriers were medication and food insecurity (50% and 67%, respectively). Our findings illustrate the power of a health fair in reaching a local, underserved Hispanic population, and underscore the need for targeted efforts in improving Hispanic health equity andaccess in Metro Detroit.

Keywords: *Hispanic health, Health equity, Health fair, Barriers to healthcare, Diabetes, Hypertension, Medication security, Food insecurity, Metro Detroit, Health behaviors*

1. Introduction

The Hispanic population is among the fastest growing in the USA, making up more than half of the total US population growth from 2010-2022 and rising to nearly 20% of the American population.[1] Unfortunately, however, Hispanic residents are disproportionately uninsured. Approximately 25% of residents lack insurance, nearly 3x the rate of non-Hispanic whites.[2] While government-driven efforts for universal health coverage have narrowed this gap, disparities in health outcomes remain, and Hispanic individuals may be negatively affected especially by high-risk conditions such as diabetes.[3]

In parallel with national trends, the state of Michigan has seen a recent growth in its Hispanic population, with demographic data showing a 29.4% Hispanic population increase from 2010-2020.[4] Much of this growth has occurred in the Detroit metropolitan area, with Detroit alone accounting for about 11% of Michigan's Hispanic population.[5] In the unique community of Southwest Detroit, colloquially known as "Mexicantown," approximately 34% of residents identify as Hispanic/Latin, and 84% of foreign-born individuals are from Latin America.[6] Similar to national trends, in Detroit Hispanic individuals are disproportionately uninsured (22%).[7] Previousresearch by the Wayne State University School of Medicine (WSUSOM) *Amigos Médicos Clinic. (AMC)*, a free, student-run clinic that emphasizes language-concordant care, suggests that local Hispanic patients face poorer quality of care as a result. Specifically, Hispanic individuals in Detroit may experience higher cost of care, difficulty affording food and medications, and worse medical literacy.[8] Past studies conclude that various interventions based at the community levelare needed to improve such inequities.[3,8,9]

One such community intervention is a health fair.[10,11] A health fair is a public event that offers free health information, screenings, and resources to the greater community. Previous findings show the usefulness of health fairs in promoting healthy behaviors[12,13] and integrating vulnerable and/or immigrant populations into the local healthcare infrastructure.[14,15] The beauty of the health fair is its simplicity: an engaging way to attract a wide array of people, often marginalized populations with adverse health disparities, to participate in health promotion. The potential benefit is not only an increase in healthy behaviors, but also a possible increase in patient access to care which subsequently sustains these healthy behaviors. One recent, relevant example includes COVID-19 vaccine events as part of a fair to promote the health of rural US veterans. Screening findings ranged from a positive HIV test to the detection of invasive colorectal cancer as well as uncontrolled hypertension.[16] Such results can have lasting benefits,especially for vulnerable populations that might not otherwise seek or have access to care.

The potential impact of such fairs on the US Hispanic population is dramatic. Studies suggest that uninsured Hispanic individuals may be more likely than other demographic groups to attend, participate in, and return to health fairs,[17,18] and such fairs may further serve to facilitate increased collaboration between community and student organizations serving a common patient population such as the Hispanic community.[19] This reflects the findings of WSUSOM's *AMC* during our inaugural 2022 Summer Health Fair, where 100% of participating organizations reported a positive increase in community awareness.[19] Another recent example of such a fair includes nearby Flint, Michigan, where local community leaders and medical students in April 2022 gathered for *Evento Primaveral* to promote the health of the growing Michigan Hispanic population, and administered COVID-19 vaccines and health information in Spanish.[20]

In 2023 we, *AMC*, continued tradition by hosting our second annual Summer Health Fair. The fair occurred at the Ford Resource and Engagement Center (FREC) in Southwest Detroit, an ideal location for reaching Hispanic individuals, and where in 2022 67% of fair attendees reported lack of insurance. In addition to typical health information, screenings, and resources offered, we again sought to gain valuable insight into our patient population through the use of a cross-sectional survey assessing demographics, general health characteristics, and barriers to care of 2023 fair attendees. In doing so we aimed to better understand the needs of the local Hispanic community and identify areas of improvement for our clinic.

Based on our findings, we identified three aims which guided the efforts of our clinic for the rest of the year. We believe that implementing these goals through our free, language-concordant clinic has improved health outcomes for Hispanic residents of Southwest Detroit. We hope to continue to incorporate such evidence-based measures, including additional surveys and health fairs, to adapt our clinic to the needs of the local Hispanic community and improve health equity for our marginalized patient population.

2. Methods

To host the health fair we partnered with various WSUSOM organizations. Services provided included eye exams, diabetes education, hearing screenings, nutritional information, medical care through the WSUSOM Mobile Health Unit, as well as patient education regarding the importance of medication compliance through the WSU School of Pharmacy. Additionally, community partners including Gleaners Food Bank, as well as the National Kidney Foundation of Michigan, were in attendance.

Attendees of the health fair were presented with a participant information sheet and, upon consent, were administered a voluntary 25-question survey in English or Spanish. Initial survey questions addressed demographics: if respondents lived in Southwest Detroit, their gender, age, if they identified as Hispanic or Latino/a, and their preferred language. Questions regarding characteristics of healthcare and medical history followed: if respondents had health insurance, if they had a primary care physician, if they had any comorbidities, sources of medical care when ill, and the length of time since their last appointment with a physician. Questions then focused on barriers to care including food insecurity, difficulty affording medication, difficulties accessing healthcare, preference for a language-concordant healthcare provider, how respondents heard about the health fair, their motivations for attending the health fair, if they would attend another health fair in the future, what they would like to see in a future health fair, and their overall satisfaction with our health fair. The last few questions asked if respondents had heard of *AMC*, whether or not they had been to

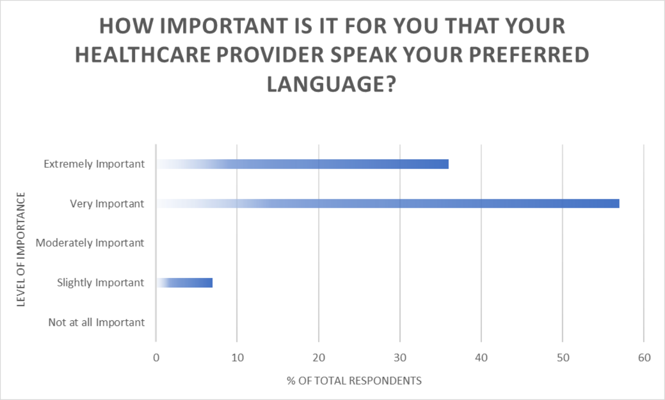
AMC, if respondents were interested in learning more about the services that *AMC* offers, and lastly any comments/suggestions for us.

3. Results

The results of our survey yielded some unique findings regarding the demographics, generalhealth characteristics, and barriers to care of 2023 health fair attendees. Demographics were first assessed: 100% of attendees (19 respondents) claimed residence in Southwest Detroit, 84% (16) identified as Hispanic/Latin, and 79% (15) selected Spanish as their preferred language, indicating that our survey reached our target demographic.

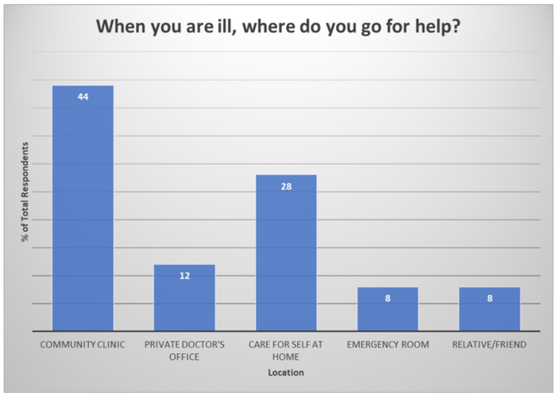
General healthcare characteristics and preferences were subsequently assessed. In agreement with current literature[22], health fair attendees preferred a physician who was language-concordant, with 36% (5) saying it was "extremely important", 57% (8) "very important", and only 7% (1) "slightly important" (Figure 1).

Figure 1: Language Concordance Preference Amongst Health Fair Attendees



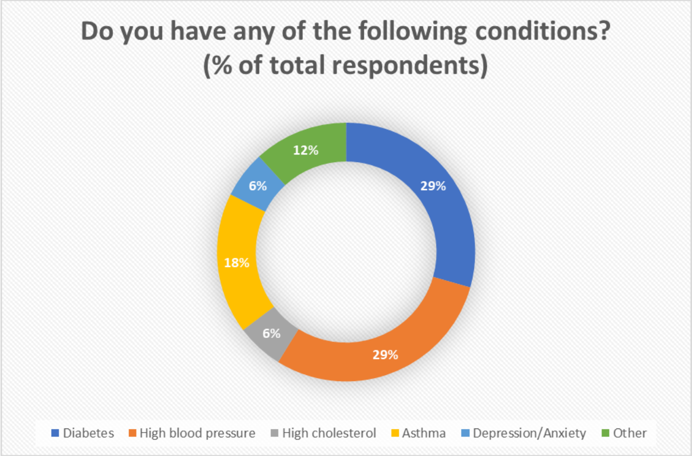
Secondly, in response to the question "When you are ill, where do you go for help?" 44% (11) of health fair attendees overwhelmingly reported "community clinic" as a source of care. 28% (7) reported "care for self at home", 8% (2) reported "emergency room", and another 8% (2) reported "relative/friend".

Figure 2: **Sources of Care When Ill Amongst Health Fair Attendees**



With regards to most prevalent medical conditions amongst health fair attendees, 29% (5) reported "high blood pressure", 29% (5) reported "diabetes", 18% (3) reported "asthma", 12% (2) reported "other", 6% (1) reported "depression/anxiety", and 6% (1) reported "high cholesterol".

Figure 3: Most Prevalent Health Conditions Amongst Health Fair Attendees



Finally, barriers to healthcare were studied. In response to the question "Do you have health insurance?" 72% (13) reported lack of health insurance coverage. Responding to the question "Do you have a primary care physician?" 67% (12) stated they did not have a primary care doctor. Additionally, 24% (5) reported "language barriers" as a difficulty experienced when obtaining healthcare. With regards to knowledge of the presence of our clinic (*AMC*) in the community, only 40% (6) stated "yes", and concern regarding lack of language concordance was cited by 33% (1) as a reason for not using our clinic.

In response to the question "Have you ever not been able to afford your medication?" 50% (7)reported "yes". When asked "In the past 12 months, have you ever had trouble buying food for yourself or your family?" 67% (10) reported a history of food insecurity.

Lastly, when responding to how they heard about the health fair, "friends/family" and "flyers" were the most common answers with 47% (8, 8) of respondents reporting each of these modalities.

Overall, 19 participants started the survey, and 15 completed it (79% completion rate).

4. Discussion

Our study shows that a cross-sectional survey at a health fair is a unique and effective way of studying the demographics, general health characteristics, and barriers to care of a local underserved Hispanic population. Our findings demonstrate that we successfully reached ourtarget sample in terms of demographics (84% of survey respondents identified as Hispanic/Latin, and 79% selected Spanish as their preferred language) and access (72% reported a lack of medical insurance, and 67% lacked a primary care physician).

Concerning general health characteristics of the surveyed group, pertinent findings include 29% each reporting a history of diabetes and high blood pressure, respectively. This is reflective of previous findings, which show a disproportionately high prevalence of diabetes and high blood pressure in the Hispanic population.[8,21] Interestingly, mental health conditions were minimally reported in our survey (6% with depression/anxiety), though studies show that trauma exposure and related psychiatric conditions may actually be disproportionately prevalent and/or underreported in Hispanic individuals as compared to other demographic groups.[23,24] We posit that our findings of low prevalence in the surveyed group may reflect an apprehension to reportsuch history due to stigma, and thus more research is needed to study this topic to identify effective ways of addressing mental health burden in Hispanic patients.

Relevant findings regarding potential barriers to care include the following: while 48% reported going to a community clinic when sick, 30% also reported using self-care at home. Moreover, 50% reported prior inability to afford medication, and 67% expressed difficulty buying food during the preceding 12 months. Lastly, 24% reported experiencing language barriers when seeking care. These are pertinent findings as they all relate to social determinants of health (SDOH) our patients experience. Fortunately, while many patients (44%) may have access to local clinics (with only 9% reporting use of the emergency room), the high proportion of respondents using self-care at home (28%) may reflect a gap in insurance coverage or general reluctance to navigate the local healthcare infrastructure. High levels of medication (50%) and food insecurity (67%) point to compounding social and cost-based barriers. These are important to consider in the context of a community clinic serving a marginalized population. As many high-risk, chronic conditions prevalent in the Hispanic community necessitate both medical and diet-based interventions, such barriers could be detrimental for local patients trying to maintain adequate control of blood sugar, blood pressure, and cholesterol levels among other biomarkers. More research may be necessary to determine how medication pricing disproportionately affects Hispanic patients, in addition to potential solutions, e.g., informing providers regarding effective, cost-friendly alternatives and utilizing discount medication programs such as GoodRx. Additionally, studying what role, if any, community clinics might play in ameliorating food insecurity is needed to improve SDOH that impact Hispanic health.

Interestingly, 47% of health fair attendees heard about the health fair either through “family/friends” or “flyers.” This shows that while flyering is an effective strategy to promote health fairs, word of mouth is also heavily important in the Hispanic community. This has benefits and drawbacks, considering that an inflection point needs to be reached in order for a new clinic serving this population to gain traction and sustainability in the local community.

Finally, with 24% of respondents reporting language barriers as an impediment to their health access, continued emphasis on language-concordant care, as practiced by *AMC*, is essential both locally and nationally for improved Hispanic health outcomes.

In summary, after analyzing these relevant findings gathered from our survey, we identified the following three goals to improve our student-run clinic initiative:

1. *Additional collaboration with local community clinics to ensure continuity of care,*
2. *Connection with local food banks and pantries to combat food insecurity,*
3. *Implementation of a medication subsidization program to alleviate the financial burden of healthcare costs for underinsured residents.*

We have already taken steps to implement goals 1-3 and believe that our efforts have positivelyimpacted the health outcomes of the local Hispanic population. Furthermore, we plan to continuously evaluate such quality improvement projects and reassess pertinent community needs to identify additional areas for growth in our clinic. Overall, we feel that our health fair survey provided an accurate description of the key health characteristics and barriers of the local Hispanic population, and formed a framework by which we plan to continuously investigate and improve the health equity of the Hispanic community of Metro Detroit.

A) Limitations

Our study has several limitations. First, our survey was conducted as a cross-sectional description of a select group of patients attending a health fair at FREC in Southwest Detroit. Itis impossible to describe all of the Hispanic individuals of Metro Detroit using our study; we instead aim to provide an idea of the general needs of this unique population. Given that Southwest Detroit has the highest percentage of Hispanic residents in Metro Detroit, we feel that our study is largely representative of Hispanic residents of Metro Detroit. It is also possible that the individuals surveyed are more likely to engage in health behaviors (i.e, attending a health fair), and thus their needs may differ from those of other Hispanic residents.

Other potential limitations of our study include user fatigue, lack of response, and survey length. While 19 participants began the survey, not all completed it, and some did not answer certain optional questions. Though only 25 questions in length with average time to completion of 5-10 minutes, the survey may have been too long, and it is possible that even amongst those who completed it, the length may have affected their responses (hurried responses, partial comprehension, limited attention, etc.). While it is difficult to assess the validity of these possibilities, future surveys may utilize less overall (but required) questions, less sections, and/or shorter prompts in order to decrease survey length and facilitate completion.

Finally, it is also possible that due to the sensitive nature of certain topics, certain findings weremisrepresented in the surveyed population. For instance, though we suspect that trauma exposure and related mental health conditions may be highly prevalent in the local Hispanic community, it is likely that due to the sensitivity of this topic, survey respondents underreportedtheir experience with these conditions. Though we reassured participants that all survey responses were confidential (as described in a participant information sheet with user consent), it is still possible that those surveyed did not feel comfortable disclosing certain information. More research is needed to determine how to best study and treat mental health concerns in the Hispanic community.

B) Future Directions

Given our findings regarding the prevalence of diabetes and hypertension among health fair attendees (29% each, respectively), further investigation is needed to ameliorate the risk of these diseases in the Hispanic community. Follow-up studies might seek to measure patient knowledge and attitudes regarding these unique conditions to identify areas for improved patienteducation and health outcomes. Additionally, future research regarding the detection and treatment of mental health conditions in the Hispanic community is also warranted. Improvement of survey presentation to better identify and broach these sensitive topics should help fill this knowledge gap.

While 48% of respondents reported going to a community clinic when sick, 30% also reported using self-care at home. Moreover, 50% reported prior inability to afford medication, and 67% expressed difficulty buying food during the preceding 12 months. Based on these findings, more investigation is needed to determine what local community clinics Hispanic patients use, when they use them, and their motivations for doing so. Additional exploration as to reasons for self-care is also warranted, as this finding may relate to personal preference/cultural factors (i.e., for holistic care) over utilizing the typical medicalized framework of local organized healthcare, or may be a necessity due to lack of insurance (considering that 72% of respondents reported lack of health insurance coverage). Follow-up studies regarding food insecurity, medication insecurity, and the benefits of connection with local clinics and community organizations (including food banks) should also be performed to identify the impact both in our local Hispanic community and beyond at a national level.

47% of health fair attendees heard about the health fair either through “family/friends” or “flyers” suggesting the importance of social reach within the Hispanic community. Future research and initiatives should focus on leveraging the social framework of the Hispanic community to promote health behaviors and improve health outcomes. *AMC* has taken steps to this end by establishing relationships with local community organizations including the Community Health and Social Services Center (CHASS) and Detroit Hispanic Development Corporation (DHDC).

Finally, since 24% of respondents reported language barriers as an impediment to their health access, future studies should investigate how to best incorporate Spanish-language services in the medical setting, including the medical school curriculum, to positively impact Hispanic health equity.

5. Conclusion

We report our findings of a health fair survey studying the Hispanic community in Metro Detroit with tangible goals identified for improved health equity and outcomes. Our study shows the usefulness of a health fair in identifying the health barriers experienced by a local Hispanic community and provides insight for improving relevant clinic initiatives and health outcomes. Asthe Hispanic population continues to grow in the United States, more efforts are needed to improve outreach, provide patient education, and promote healthy behaviors within this growing community. Health fairs represent an excellent way to accomplish this goal given the access, convenience, and social milieu they provide. Qualitative research can provide useful insights into the demographics, needs, and barriers of patients attending these events. Future research should reassess the needs of the Hispanic community of Metro Detroit, the success of our initiatives in improving their health outcomes, and the applicability of our findings to other Hispanic populations nationally.

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Ethics Approval

This study was approved by the Institutional Review Board (IRB) of Wayne State University School of Medicine (protocol 23-05-5801).

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Hispanic Breast Cancer Survivors Share Their Perceptions About Endocrine Blocking Therapy Adherence

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1. Introduction

Breast cancer is the second most prevalent cancer among women in the U.S. after non-melanoma skin cancer, and the second leading cause of death in this population[1]. The Hispanic/Latino ethnic group includes any person of Latin American or Spanish culture or origin, regardless of race[2]; this article uses the term Hispanic. Among Hispanic women in the U.S., breast cancer stands as the primary cause of cancer-related mortality, accounting for 14% of fatalities (n = 3100), and the most frequently diagnosed cancer, representing 29% (n = 28,100) of cases[3]. Although breast cancer prevalence is lower in Hispanic than in non-Hispanic White (NHW) women, documented ethnic-based disparities between the two groups affect breast cancer outcomes[4]. Hispanic women tend to be diagnosed with breast cancer at younger ages and at more advanced stages than NHW women[3, 5]. They also experience lower 5-year relative breast cancer survival (88%) than NHW women (92%)[3, 6] and are less likely to receive adequate and timely treatment[3].

Structural socio-economic barriers, limited English proficiency, and cultural beliefs contribute to the challenges and misperceptions of breast cancer among Hispanic women[7,8]. Hispanic women face difficulties accessing quality healthcare due to resource barriers (limited insurance, burden of cost, and lack of information)[8, 9],; also, they often report feeling overwhelmed by medical information and are less involved in decision-making[8]. Moreover, acculturation, the process of individuals adapting to a new society, can influence their healthcare decisions in that, higher acculturation reflects higher assimilation to the new culture and vice versa[11]. Evidence suggests that lower acculturation is associated with a lack of communication or understanding of breast cancer diagnosis and treatment among Hispanic women[12].

Hormone receptor-positive (HR+) is the most common subtype among Hispanic women, accounting for 62.6 % of cases[1]. Oral endocrine blocking therapy (EBT) is a standard adjuvant treatment for HR+ breast cancer, including tamoxifen or Aromatase inhibitors (AIs) that prevent tumor recurrence by blocking estrogen and progesterone hormones involved in cancer growth[13]. EBT is a long-term daily treatment (5 to 10 years); potential side effects include hot flashes, vaginal dryness, changes in the menstrual cycle, bone pain, and secondary cancers among others[14]. Tamoxifen reduced both breast cancer recurrence by 40% and mortality by 34% when compared to patients receiving placebo[15]; additionally, 10-year therapy with Tamoxifen showed lower risk of cancer recurrence as compared to 5-year therapy[16]. In postmenopausal women, AIs compared to tamoxifen led to 33% fewer recurrences and 15% fewer breast cancer deaths during the first decade[17]. Despite proven benefits, many breast cancer survivors do not take EBT as prescribed, leading to risk of recurrence and reduced survival[18, 19]. Factors contributing to non-adherence include side effects, medication safety concerns, limited access to medication, perception of cancer recurrence, and quality of patient-provider relationship.[20, 21]

Compared to other ethnic/racial groups, Hispanic breast cancer survivors have higher non-adherence to EBT and higher discontinuation rates[4, 22]. Only 36% of Hispanic women were adherent to the recommended 5-year long-term EBT treatment[23]. They often unintentionally missed doses and had limited knowledge of EBT benefits[7, 24]. Because non-adherence to EBT has been shown to negatively affect survival outcomes and increase mortality rates[25, 26], differential utilization of EBT may contribute to the disparities in Hispanic breast cancer outcomes. Therefore, it is crucial to have a better understanding of the multi-dimensional factors for EBT non-adherence in Hispanic breast cancer survivors. The study aims to explore the perceptions of Hispanic breast cancer survivors regarding EBT use and factors influencing adherence.

2. Methods

Study Design

This qualitative study explored Hispanic breast cancer survivors' perspectives on EBT adherence. This manuscript followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines[27].

Conceptual Framework

The *Conceptual Model for Medication Adherence* (CMMA) was used to guide the interview script and data analysis[28]. This model describes medication adherence as a phenomenon influenced by the interaction of: *Patient-related factors* (knowledge, attitudes, beliefs, perceptions, and expectations of the patient); *condition-related factors* (severity of symptoms, level of disability, and progression of the disease); *medication-related factors* (side effects, complexity of the treatment, and duration of the treatment); *socioeconomic factors* (poverty, level of education, employment status, social support); and *health system/healthcare provider-related factors* (patient-provider relationship, healthcare characteristics, quality of healthcare services)[29].

Research Team

This study team comprised two Hispanic doctorate-prepared oncology nurses (CGC, ERR); a Hispanic professor of medical oncology and health equity researcher (AML); a population science researcher (KYW); a research coordinator (RS); a research assistant (RP); and a qualitative senior research scientist (RF). All the interviews were conducted by CGC, a doctorate-prepared oncology nurse practitioner and nursing associate professor who was awarded the aforementioned NIH Diversity Supplement grant. CGC 's positionality as a first-generation college graduate, middle-income class Hispanic woman raised in Colombia, fluent in Spanish and English, living in the U.S. for about 30 years, informs her perspective in this study.

Participant Selection and Setting

Participants were female cis-gender women diagnosed with breast cancer who a) self-identified as Hispanic/Latina/Latino/Latinx, b) spoke English and/or Spanish, c) were 18 years old or older, d) had a breast cancer diagnosis, e) were receiving or had received EBT, and f) had access to a cell phone and/or the internet. Recruitment was conducted between April and August 2022 and included social media invitations, email blasts to Hispanic breast cancer survivors at Jefferson Health (Philadelphia region and South New Jersey), and email invitations shared with various Hispanic cancer support groups located in New Jersey, California, and Florida. The first author (CGC) screened potential participants for eligibility. Verbal consent was obtained. Each participant received a $30 gift card at the end of the study to thank them for their participation.

Data Collection

A semi-structured interview guide, informed by CMMA[28] and a literature review, included open-ended questions on participants' EBT experiences (Table 1). The interview guide, written in English and Spanish, was piloted with the Latino Cancer Institute team members. Participants completed a short demographic questionnaire and the Marin Short Acculturation Scale for Hispanics[30]. Interviews, lasting about one hour, were conducted in English or Spanish (participant's preference) by CGC, recorded, transcribed, and de-identified. CGC reviewed the transcripts against the audio recordings for accuracy.

Table 1. Semi-Structured Interview Questions

Type of Question	Questions and Probes
Open-ended	1. Tell me about your experience with hormone therapy for the treatment of breast cancer. Probes: • What things or situation made it difficult? • What was helpful for you? • Who or what supported you during the treatment? • Which type of things did you do to take care of yourself? 2. Are you currently taking hormone therapy for breast cancer? If yes: Which factors made you decide to keep taking the medication? If no: Which factors made you decide to stop taking the medication? 3. If you were to explain to a woman diagnosed with breast cancer about the reasons of why hormone therapy is recommended to treat breast cancer, what would you say to her? 4. Thinking about your experience taking hormone therapy to treat breast cancer, is there anything that your healthcare team could have done differently to make your experience taking the hormone therapy a bit easier?

Data Analysis

Responses to open-ended questions were analyzed using content analysis.[31] Spanish transcripts were reviewed by Spanish-speaking researchers (CGC, ERR). Codes were developed based on the conceptual model and line-by-line reading of a sample of transcripts[28]. Each code was defined to ensure coding accuracy, and data saturation was determined by deployment of a constant-comparison approach. Saturation (no new data emerged from later interviews)[32], was confirmed with a sample of 18 participants. Coding was facilitated using NVivo 20 software[33]. The coding team (CGC, RS, ERR) met and resolved major discrepancies in coding. Final inter-coder reliability was calculated with NVivo (using k coefficient). A mean k value of 1 indicates complete agreement[34]. Inter-coder reliability was found to be near perfect (k=0.95/1.00). The codes were organized into CMMA-informed thematic categories. Descriptive statistics were used for demographic questions and the acculturation scale.

3. Results

Sample Characteristics

The study participants included 18 Hispanic women mainly aged 41 to 70 and multi-race; incidentally they were split equally between Spanish and English speakers. Tables 2 and 3 display demographic characteristics and acculturation scores respectively.

Table 2. Demographic Characteristics of Participants

CATEGORIES	ENGLISH-SPEAKING (N=9)		SPANISH-SPEAKING (N=9)	
	n	%	n	%
Age				
20-30	0	0	0	0
31-40	1	11	0	0
41-50	3	33	5	56
51-60	4	44	2	22
61-70	1	11	2	22
71+	0	0	0	0
Race				
Black/Afro Hispanic	0	0	5	56
White	2	22	0	0
Mestiza	1	11	2	22
Multi-race	6	67	2	22
Education Level				
Elementary	0	0	4	44
Some high school	0	0	0	0
High school completed	2	22	3	33
Some college	3	33	0	0
Technical	1	11	2	22
College completed	1	11	0	0
Post-college	2	22	0	0
Marital Status				
Single	0	0	4	44
Divorced	0	0	3	33
Widowed	0	0	1	11
Married	9	100	1	11
Continues...				
Income				
0-15,000	0	0	7	78
15,001-30,000	0	0	2	22
30,001-45,000	1	11	0	0
45,001-60,000	3	33	0	0
60,001-75,000	0	0	0	0
75,001+	5	56	0	0
Employment Status				
Retired	1	11	0	0
Full time	2	22	1	11
Part time	1	11	3	33
Homemaker	1	11	1	11
Disability	2	22	4	44
Unemployed	1	11	0	0
Other	1	11	0	0
***Table continues:* EBT**				
Tamoxifen	2	22	8	89
Anastrozole	3	33	0	0
Letrozole	2	22	0	0
Exemestane	0	0	1	11
Taking EBT				
Currently taking	9	100	6	67
Completed treatment	0	0	3	33
Stopped taking medication	0	0	0	0

Note: While the study did not compare the two language-groups due to a small sample size, demographic and acculturation differences were observed. Generally, English speakers showed higher acculturation, education, and income levels compared to the Spanish-speaking group.

Table 3. Marin Short Acculturation Scale in Hispanic Women Diagnosed with Breast Cancer

Category	*English Speaking Mean (SD) n=9*	*Spanish Speaking Mean (SD) n=9*	*t (16)*	*p*
Preferred Language Used in Personal Life	3.22 (0.75)	1.62 (0.57)	5.052	*<.001*
Preferred Language Used for Media	3.92 (0.59)	1.66 (0.92)	6.146	*<.001*
Preferred Language for Ethnic Social Relations	*3.51 (0.58)*	*1.77 (0.86)*	*5.010*	*<.001*

This study found that the English-speaking group of Hispanic breast cancer survivors have statistically significantly higher acculturation levels for each subcategory than the Spanish-speaking group including personal language (3.22 ± 0.75), t (16) = 5.052, p<0.001; media language (3.92 ± 0.59), t (16) = 6.146, p<0.001; and social language (3.51 ± 0.58), t (16) = 5.010, p< 0.001). Higher scores reflect a higher level of acculturation while lower scores reflect lower level of acculturation. Scores in the middle indicate bi- culturalism.

Thematic Categories

Data analysis revealed 9 themes grouped into five categories CMMA-based: Patient factors, socioeconomic factors, medication-related factors, healthcare factors, and cancer-related factors. Below, the themes and subthemes are supported by participant quotes in Table 4.

3.1 Patient Factors

Themes: Cancer survival, self-care, and support system.

Theme: Cancer Survival. The main driving force for all participants to adhere to EBT was to increase their chances of cancer survival and consequently to improve their likelihood of spending more time with their loved ones (Table 5). One participant (P8) said, “Just to know that if I take the pill, it is going to stop the cancer and I am going to continue living.” Several participants wanted to survive to be with their family, especially their children. A participant (P2) said, “My daughter is the biggest factor; she's so young that I have certain milestones set. The first one is making it to that kindergarten graduation.”

Theme: Self-Care. Participants embraced self-care behaviors by making time for themselves post-diagnosis, adopting exercise routines, creating healthier diets, and managing their emotional care by spending time with their families, receiving counseling, or helping others (Table 5). But for most, faith in God was the main approach. One participant (P7) expressed, “First of all, I had God’s support. I felt that He was with me. His support, when we are in the middle of the night and one cries, and one feels asphyxiated, suffering, He is there to support you.”

Participants learned to self-advocate with doctors, some initially feeling intimidated but gaining confidence through peer support. One participant (P14) said, “Talk to your doctors and slowly ease yourself in and ask a ton of questions and don't be afraid to advocate for yourself; and if you're not happy with the answer you have, ask again. If you still don't like the answer, go somewhere else and don't stop.”

Self-accountability was stressed by another participant, who emphasized the patient’s responsibility to take the medication (P7), “You can’t just go and blame the doctor if something happens if you didn’t take the medication. One is responsible for our own decisions, and your decision can take you to survival or to dying. It’s that easy.”

Theme: Support System. Participants valued support from their families, support groups, and various sources (Table 5). Family support varied, with some prioritizing open communication to express their needs while others hesitated to share emotions for fear of invoking sadness in their families. Besides family, support groups were greatly beneficial, but could be distressing when learning of peers experiencing cancer recurrence or death. When participants lacked family support, the group offered them the comfort they needed. Also, support groups were valued as a source of education to learn how to manage certain side effects caused by the EBT, especially for those participants who did not receive information from their doctors about symptom management. Additional support came from church and breast cancer organizations.

One participant (P16) talked about receiving text messages being helpful to not feeling alone,
"One of the ladies that I met through my church group sent me affirmative messages, things like, you can do this. God loves you. Stay strong, little snippets… getting that message. I knew that somebody was thinking of me, that I wasn't alone, that I was loved."

3.2 Socioeconomic Factors

Themes: Hispanic culture; health insurance and financial issues.

Theme: Hispanic Culture. Participants discussed how their Hispanic culture influenced their cancer experience and how they managed their diagnoses and related treatment. They shared their beliefs about natural remedies, family values, female values, and faith in God.

Natural remedies. Some participants reported using home remedies either because they believed these could cure their disease or because they were given the remedy by a friend or family member (Table 5). For example, one participant (P10) reported getting advice from her neighbor, "It's very easy for women in the Hispanic community to take advice from people who are not in the medical field. Your neighbor seems to know more than your doctor does." (P2)

Family values. Participants talked about how their Hispanic culture, involving deep family values, affected their management of cancer treatment. For example, women's strong dedication to their family made them neglect themselves (Table 5). One participant (P11) said, "I think our culture as Hispanics is work, work, provide, and it's not, oh my God, let me stop. Let me take care of myself." Another family value among Hispanics is the influence of men in decision-making. One participant (P9) explained "Well, my husband told me to take it [EBT]. I did it because he told me so. Usually, I do whatever he tells me to do."

Women values. Participants talked about the influence of Hispanic culture on their values as women including how they feel about their femininity, womanhood, and resilience (Table 5). One participant (P13) expressed it emotionally, "It doesn't help me much when I think that Latina women are feminine, very sensual, very sexual; we make ourselves beautiful. Right now, I am not at the best time of my life. It is a disadvantage for me."

Theme: Health insurance and financial issues. While most participants had health insurance and access to medication, they struggled to pay for the costly medication copays. Uninsured participants faced delays in receiving oncology care and limited ability to afford medications. (Table 4).

Table 4. Themes, Subthemes, and Supportive Quotes

Patient-Related Themes	Subthemes	Participant Quote
Cancer survival		"I told the doctor that I wanted to do all I could to prolong my life." (P13)
Self-care	Physical care Emotional care Faith in God Self-advocacy Self-accountability	"I became a little bit selfish. I am a person who always does things for other people and keeps pleasing the entire world. But now with my disease, I am taking care of myself first". (13) "My greatest form of meditation is exercise, and it has to be a somewhat intense exercise so that I don't think of anything else as I'm doing it. That to me is the best form of self-care". (P2) "Now I know how to advocate a little bit more. And I can tell my doctors this is what's happening... I couldn't advocate for myself before, and they [support groups] have taught me. I've just been listening to their stories or them giving me advice of whatever it was like I'm saying." (P3) "A cancer diagnosis is a tragedy, but I prayed and had faith in God." (P6)
Support System	Family Support groups	"I have the support of my family, my children, my grandchildren. They live in another state, but they came to stay with me. They helped me a lot". (P4) "I found them [support groups] very rewarding because I can ask or say anything and then know that there will be no judgment whatsoever because someone more than likely has been there or can relate, and all I'm going to get back is understanding of what I'm going through on whatever given day." (P1) "My church family came together and supported... They cooked meals for my children for three months, which was amazing because that meant that I didn't have to do it. I'm a single mom, obviously, so that was helpful...I also had the Breast Cancer Association that does different things for women that are going through the struggle." (P16)
Socioeconomic Factors		
Hispanic Culture	Natural remedies Family values Women values	"The truth is that I have been taking soursop leaf tea because they say that it helps to reduce the tumors; my sister sent it from Mexico because it is difficult to find it here." (P10) "If you are feeling anything in your body, as a woman, go to the doctor; don't put that behind just because you have to go with your parents or your kids... I did that, I put myself in the back. I have to cancel my appointment because I have to take care of all that stuff." (P3) "There are things that are very painful and will continue to be painful...stop breastfeeding my baby...and my beauty, my body. I am a dancer, and I was very beautiful...now I look at myself in the mirror and I don't recognize myself." (P13) "A woman who is used to fight, and I say this, as Latinas, we move on and always look for alternatives; at least that has always been my case, but when they told me I had cancer, it was devastating." (P8)
Health insurance and financial issues		"My husband had lost his job and because I was self- employed, I didn't have insurance; we had state aid. It took a long time to get to see an oncologist...I was just on my own. (P3) "I'm thankful that I work at a company that allows me to have good health care. It is expensive. It's the most expensive bill in my regimen. So when insurance changes and I have to meet deductibles, it does add up...It is a bit more challenging sometimes." (P16)
Medication-related Factors		
Side effects Impact	Intimacy Mood Swings	"Obviously the dryness, the vaginal dryness and the lack of energy, the lack of sexual energy obviously is no longer there. It completely goes away. And it's very difficult if you are in a relationship, to go through that as a human and as a woman. It's really difficult because you go from not having a perfect relationship by having some sort of like a rapport with your partner and then to completely disengage." (P18)

Table Continues:

		"If you don't take your pills at the same time every day, you get mood swings. Your hot flashes are out of control. You suffer in silence because you're like, I need to take this medicine". (P11)
Healthcare System/ Healthcare Providers Factors		
Communication with doctors	Education or lack of confidence in doctor	"It is pretty horrific…they [doctors] don't tell you that. Nobody told me your vagina is broken until you figure that out and you're just like, what in the world is going on? It's awful." (P14) "Nobody ever told me anything about side effects back then…I just suffered. I just suffered with all, especially the female part or the internals and the problems of the constant urinary infections, of the constant tearing down there that pains and stuff that I felt. It was just me. I didn't know doctors never offered and I never asked at that time." (P3) "God first, but I had confidence in my doctor. If she studied and learned about the medication, I should trust her and take the medication." (P6)
Medical staffing		"I think that in the cancer center where I receive care, there is a shortage of healthcare workers. There is a shortage of administrative staff. I feel that the process to give me a final diagnosis could have been faster, so my doctor could have made a quicker decision about my treatment." (P13)
Cancer-Related Factors		
Cancer recurrence		"Because, it helps you get into a calmer place… Where you know these medications are trying to stop something from happening to you so you get a little peace of mind along with the brutal treatment of it." (P18)

3.3 Medication-Related Factors

Theme: Side Effects Impact. All participants discussed the physical and emotional consequences of side effects from EBT medication (Table 5). Fatigue, hot flashes, and joint pain were described as minimal-to-moderate side effects, but vaginal dryness and mood changes were reported intensely by most participants.

Intimacy. During the interviews, many women reported vaginal dryness as the most dramatic side effect, which made intercourse very painful and affected their intimacy with their husband/partner. The language and emotion these women used reflected the depth and breadth of their suffering. This situation was worsened by their medical teams' failure to inform participants about this side effect and its management. One participant (P1) spoke about how this situation affected her relationship with her husband, "It's still difficult to manage, not just for me. I understand the why, but trying to explain it to my husband—there's nothing to do with you. It's me. Yes, it's just not something that he understands. I mean, he may claim he does, he doesn't, I assure you, he doesn't. I think if he ever actually got to feel what it feels like, he would never once ask for sex ever again, but unfortunately, I can't do more than describe it to him. It feels like they're stabbing you."

*Mood swings***.** Some women felt emotionally unpredictable and conflicted about having to take the medication despite its side effects. One participant (P3) talked about the impact of her mood swings on her child, "I realized that I did have mood swings. I had anger issues, but I didn't associate it with that medication…after the five years … and then one day he goes, 'Mommy, you're not mad anymore.' That's like my poor baby, right? Because it was like I didn't mean to. Nobody tells you that, right? Sometimes you are just in this mode. And for a child to notice."

3.4 Healthcare System/Healthcare Providers Factors

Themes: Communication with doctors, medical staffing.
Theme: Communication with doctors. Participants had mixed feelings about their experience with their oncologists. Some were distressed because of the lack of education by their doctors, while others felt satisfied because they trusted and felt supported by their medical team. Many expressed frustrations with their oncologists over not explaining the EBT side effects, believing proper education about their treatment and symptom management could have alleviated their

suffering.

Some participants felt that patient-doctor communication was vital for treatment adherence, yet some doctors failed in this aspect. One participant (P11) said it clearly, “We are not educated enough…Whether it's in side effects, what to do for the hormones as far as immediate menopause symptoms, diet change, appetite, depression, mood swings—you have so much from the hormone therapy that the doctor doesn't say.”
Another participant felt her doctor did not listen to their symptom-related complaints, reporting (P12) “Even when the cancer was coming back to my bones, he [doctor] didn’t say anything. The doctor in the hospital didn’t help me much, because if he did, he would have ordered an MRI and not wait until I fractured my bones.”
However, other participants felt that their doctors and cancer care team were helpful, particularly that confidence in their doctor was crucial for taking the treatment as prescribed (Table 5). One participant (P16) said, “I didn't know it at the time, but I was not alone. The nurses, for one, and the oncologist were amazing.”

Theme: Medical staffing. Some participants reflected on how the health institution staffing and personnel shortages affected their cancer experience. One participant (P3) said, “We are in a rural area and a lot of these doctors come [and go]. They do their time here, so their debt is lowered or whatever, so we get a lot of turnover doctors ... So, when I had that [cancer], I know that I was just being another number… you know you’re not going to get something that is medically necessary.”

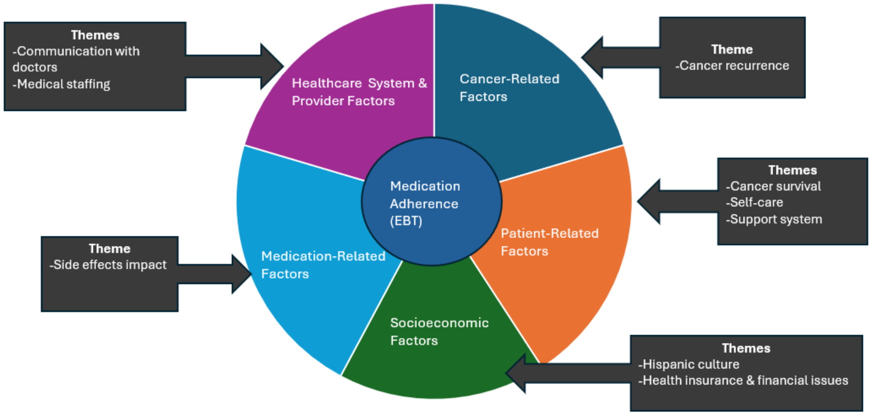
3.5 Cancer Related-Factors

Theme: Cancer recurrence. Fear of cancer recurrence was a major factor for participants to take EBT. One participant (P5) said, “I don’t want to go through this all over again. I take it [EBT] thinking that it [cancer] is not going to return.”

4. Discussion

This qualitative study examined the perceptions of 18 Hispanic breast cancer survivors about taking EBT with emphasis on factors that facilitated and/or obstructed their adherence to treatment. The demographics and acculturation scale data showed that Spanish-speaking women had lower acculturation levels, which is not surprising given that the Marin acculturation scale is based mostly on language. Additionally, Spanish speaking participants were most likely to have lower levels of education and lower annual income than the English-speaking women. Importantly, while there were differences in the demographics and acculturation levels between the Spanish-speaking and English-speaking participants, no qualitative comparisons were made between the groups due to the study’s purpose and the small sample size. This study identified multiple themes and sub-themes that influence the long-term use of EBT to treat breast cancer in Hispanic women. We will use the CMMA classification for this discussion[28] (Figure 1).

Figure 1. Themes using the Conceptual Model for Medication Adherence



Peh KQE, Kwan YH, Goh H, et al. An adaptable framework for factors contributing to medication adherence: results from a systematic review of 102 conceptual frameworks.

Patient-related themes: Cancer survival, self-care, and support system.
Improving cancer survival and being present for their loved ones were principal motivators for taking EBT for all participants, aligning with studies showing better adherence when patients believe in the treatment's benefits[35, 36]. Breast cancer patients who trusted the importance of taking the EBT for their personal benefit were more likely to adhere to the treatment[37].

Self-care is the individual's ability to promote their own health and to cope with illness, with or without professional healthcare support[38]. In this study, women demonstrated strong self-care abilities. Some adopted new routines of exercise and nutrition while others reinforced or discovered their capacity to advocate for themselves. These coping strategies and self-care behaviors are beneficial to improving medication-adherence particularly in patients with chronic illnesses[39]. Considering faith is significant for most Hispanics, many participants relied on spirituality, viewing it as a source of strength and resilience.[40] Some participants spoke about being Catholic, the main faith among Hispanics in the United States.[41]

Family members were a major support system for many participants, while peer support groups were essential for others. Similar to our findings that either in-person or online peer support groups were a safe environment for sharing experiences and learning, those from a systematic review in which cancer peer-support groups were perceived useful by cancer survivors because of the opportunities for helping others, sharing information to manage the symptoms, and promoting humor[42]. Additionally, peer-support groups have been found to enhance patients' empowerment, leading to increased medication adherence and patient-provider communication[43]. However, participants found it distressing when confronted with peers' death or suffering, and some online groups pose risks of information and financial exploitation[44].

Socio-economic Themes: Hispanic culture (natural remedies, family values, women's values), and health insurance and financial issues.

Hispanic culture was reflected in the use of natural remedies, family values, and women's values. Some participants attributed consuming natural remedies as part of their Hispanic heritage, though not all did. Those who did so paired them with prescribed medications without informing their healthcare providers. Similarly, results from the Study of Women's Health Across the Nation (SWAN) reported that 88.8% (n=107) of Hispanic women used herbal remedies for their overall health and only 14% (15) of them reported their use to their doctors[45].

Some participants expressed family values, such as familismo and machismo. *Familismo* is a core Hispanic value that emphasizes the family unit in terms of support, respect, and obligation, and as such, it can be both a protective factor and a risk factor[46, 47]. Most participants in this study felt supported and protected by their families, yet some expressed frustration when, on a daily basis, they neglected their own care by putting their family first, as expected in Hispanic families. *Machismo*, more common among less acculturated Hispanics, promotes male dominance and was noted by one participant who spoke about taking EBT because her husband told her to do it[48]. Despite this, many participants in our study spoke about the relevance of adopting self-care and self-advocacy behaviors after being diagnosed with cancer.

Femininity and *hembrismo* are significant gender-role values in Hispanic culture. For Hispanic women, *femininity* emphasizes power through physical beauty, and motherhood, expressed through love, breastfeeding, and biological reproduction[49]. One participant felt that the cancer-related body changes she experienced robbed her not only of her beauty but also of the experience of breastfeeding and having children. Among Hispanic women, this sentiment is augmented by conflicting changes between traditional and modern definitions of femininity[49]. For example, the current ideal of Hispanic beauty, the 'Maja,' is a Hispanic woman with curvy but thin features[50]. This idyllic image of the Hispanic woman challenges the realities of Hispanic women physically affected by breast cancer and its treatments. Another participant spoke about the resilience and strength traditionally present in Hispanic women. Described in the literature as *hembrismo*, this participant's stand explains how Hispanic women historically have lived through socio-political injustices, oppression, and marginalization and have overcome the challenges through empowerment and leadership[49].

Health insurance and financial factors included difficulty navigating the health system to access medications at lower prices and experiencing lack of health insurance. Evidence shows Hispanic women with breast cancer often receive inappropriate care due to limited access to healthcare and socio-economic barriers[51, 52].

Medication-related Themes: Side effects impact

Consistent with the literature, all our study participants experienced EBT-induced side effects, ranging from mild to severe, such as joint pain, vaginal dryness, fatigue, hot flashes, and/or mood changes[20]. These symptoms, when severe, can affect mental wellbeing[53]. Aligning with other studies, some participants adhered to their medication, but some reported conflicting feelings about balancing improved survival with a lower quality of life[20].

Vaginal dryness and mood swings emerged distinctly among the side effects. Several participants shared how severely vaginal dryness affected their sexuality and intimacy with their partners. This is consistent with research reporting high rates of sexual dysfunction in Hispanic and non-Hispanic breast cancer survivors (26%)[54], which often goes underdiagnosed because they do not report their symptoms or undermanaged because symptoms are poorly managed by their medical providers[54, 55]. Overall, reporting of sexual dysfunction tends to be higher in younger women and in early cancer stages[54].

Similar to other findings in a qualitiative review, mood swings impacted the participants' relationship with their children, with some distressed by unintentional emotional interactions and being unaware of them. This highlights the daily challenges EBT side effects have on relationships[53].

Healthcare system/Healthcare Providers Themes: Communication with doctors and medical staffing.

Although several participants were satisfied with communication with doctors and the information they offered, many were not. They were surprised when experiencing intense side effects and receiving minimal guidance to manage them.

Other studies reported women's struggles to understand the severity of menopausal symptoms induced by EBT[53]. Similarly, women in other studies felt well-informed about their treatment but received insufficient support when managing EBT on their own[53, 56]. Like some of our participants, women in other studies felt that their concerns were minimized or ignored by their doctors[53]. A good patient-physician relationship is crucial for improved medication adherence[57]. In our study, all participants adhered to their treatments, but better communication would have minimized uncertainty and suffering.

The medical staffing theme in our study reflected how structural issues and personnel shortages in the healthcare system impacted participants' care, with doctor rotation creating fragmentation of care and feelings of depersonalization in patients. Another study reported that women who received breast cancer care mainly by one physician were most likely to adhere to EBT and experience continuity of care[20]. While some participants in our study experienced this, others perceived their care as fragmented.

Cancer-related themes: cancer recurrence

Several participants reported fear of recurrence as a motivator to adhere to EBT despite its side effects. Similarly, a systematic review found that individuals who were fearful of cancer recurrence were more diligent following cancer care recommendations[58].

Limitations

There were limitations to this study. The sample size was not large enough to generalize the findings to all Hispanic women; however, recruiting from four different regions in the U.S. made the sample diverse. Selection bias may have occurred as many participants were recruited from one cancer center where care was provided by one well-recognized Hispanic provider in the region, potentially influencing their similar experiences and the study results.

5. Conclusion

Guided by the CMMA, this study identified multiple factors that influence EBT adherence in Hispanic breast cancer survivors. These findings reflect pervasive gaps in care in this patient population. Persistence in these gaps suggests that the interventions provided to improve education, symptom management, and support to Hispanic breast cancer survivors are not effective, or that their needs are not being addressed. This study reported the participants' strong desire for a reliable relationship with their doctors that for many was not met. Structural health system issues are difficult to tackle but lack of education and support by their medical providers are not. It is essential that medical providers build a strong and trustworthy patient-provider relationship by providing the appropriate information about EBT side effects and symptom management, including referring to a sexologist when appropriate, regularly assessing patient's needs, and having relevant conversations about medication adherence.

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Ethics Approval: This study was approved by Thomas Jefferson University Institutional Review Board (IRB) (45 CFR 46.101 Control #19F.265-1). The approval verifies that the IRB operates in accordance with applicable federal, local, and institutional regulations that govern IRB operations.

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A Dual Diagnosis of Myasthenia Gravis and Sjogren’s Syndrome in a Hispanic Patient: A Case-based Discussion of Clinical Findings, Therapeutic Implications, and Culturally Competent Care

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ABSTRACT
The co-occurrence of myasthenia gravis (MG) and Sjogren's syndrome (SS) in a young, Hispanic, female patient underscores the diagnostic and therapeutic complexities inherent in autoimmune disorders. MG, a rare neuromuscular disorder characterized by autoantibodies impairing neuromuscular transmission, leads to variable muscle weakness and fatigue, notably affecting ocular and bulbar muscles. SS, an autoimmune condition with systemic manifestations, primarily affects secretory glands, resulting in symptoms such as xerostomia and xerophthalmia. Both conditions have higher prevalence rates in females, with MG particularly affecting young women under 40. Herein we present a case report and case-based discussion on diagnostic and management challenges of these two autoimmune conditions while highlighting issues specific to the Hispanic and underrepresented populations. Our goal is to highlight the intricate interplay between these two autoimmune pathologies to allow for more rapid recognition and reduce delay in diagnosis.

Keywords: *Muscle weakness, Myasthenia gravis (MG), Autoimmune Disorders, Sjogren’s Syndrome (SS), Autoantibodies, Diagnostic challenges*

1. Introduction

1.1 Muscle weakness in the primary care clinic:

True muscle weakness, in contradistinction to fatigue or pain or joint-related motor impairment, is a common presenting complaint to the primary care physician. While the differential diagnoses are broad and include electrolyte deficiency, endocrine, rheumatologic, genetic, medication or toxin-related, infectious, and neurodegenerative disorders,[1] a careful history noting the distribution of the weakness and physical examination provide diagnostic clues. For example, bulbar weakness, defined as oral and pharyngeal muscle weakness and characterized symptomatically by dysphagia, dysarthria, and dysfunctional mastication,[2] may be caused by neurologic etiologies like myasthenia gravis (MG), amyotrophic lateral sclerosis (ALS), syphilis (bulbar variant), and also endocrine pathologies like hyperthyroidism.[1] Herein we aim to provide an overview of two relatively rare causes of bulbar muscle weakness co-presenting in a single patient along with their clinical manifestations, diagnostic criteria, and treatment rationale. Our rationale for evaluating them together in the context of this case study is to increase clinical awareness and improve diagnostic efficiency as delayed diagnosis of one or both of these has clinical and psychological import.

1.2 Myasthenia gravis: epidemiology and classification:

Myasthenia gravis (MG) is a complex autoimmune neuromuscular disorder characterized by the production of autoantibodies directed against the acetylcholine receptor (AChR) or other proteins critical for neuromuscular signaling. This disease affects the neuromuscular junction, leading to profound muscle weakness and fatigue, especially in the ocular, bulbar, and proximal muscles of the extremities.[3] Its incidence per year is estimated to be between 8 to 10 cases per million, with an approximate prevalence of 150 to 200 cases per million in the United States.[4] According to the National Institute of Neurological Disorders and Stroke this condition is more likely to affect young women under 40 years of age and men over 60 years of age.[5]

In Central and South America, prevalence figures are much lower than those mentioned above, generally less than 100 cases per 100,000 habitants. Given that figures from the Iberian Peninsula are generally consistent with other reported prevalence rates, the low rates in Central and South America are likely from underreporting[6]. Regardless of where the statistics are derived from, epidemiological data consistently show a higher incidence in women, with a peak between 20 and 40 years and another between 60 and 80 years, while in men it predominates at advanced ages with a sustained increase from 60 years.[6]

The diagnostic nomenclature of myasthenia gravis is complicated and can be intimidating to the most seasoned clinician. Given that it is based on clinical, epidemiological, immunological, and genetic findings, as well as thymus pathology, it can quickly become confusing by its overlap and redundancy. We suggest first sub-classifying myasthenia gravis (MG) as to antibodies against acetylcholine receptors (AChR-MG) which are found in approximately 80% of MG patients. Within this sero-positive-AChR-MG category, further classification is based on both the location of the affected muscles and the timing of onset; pure ocular MG (OMG), early-onset MG (EOMG, onset <45 years), and late-onset MG (LOMG, onset >45 years).[3,7]

EOMG typically presents with lymph follicular hyperplasia of the thymus. In contrast, LOMG is characterized by an age-dependent involution of the thymus.[7] Additionally, 10–15% of all patients within this AChR-MG classification are affected by thymoma.[7] When MG occurs together with a thymoma, MG is considered a paraneoplastic syndrome. Though the presence of antibodies to the AChR is the main cause of weakness in these patients, they often have other antibodies to the striated muscle protein titin or to a calcium channel in the sarcoplasmic reticulum known as RyR.[8]

In the OMG subtype most of the patients with ocular symptoms at onset will progress to generalized forms of the disease, usually within two years of onset,[3] with 90% of the remaining continue to have ocular manifestations only.[3] Hence, ocular MG is defined by isolated extra-ocular involvement for a period of ≥2 years. Over half of the patients in this group have antibodies against AChRs.

In addition to anticholinergic antibodies, other subtypes include antibodies to a muscle specific tyrosine kinase (Anti-MuSK-Ab-associated MG) (MAMG). MAMG is found in approximately 7–10% of all MG patients and up to 40% of patients with generalized MG who are seronegative for anticholinergic receptor antibodies (AchR Abs). This variant often has an acute onset affecting the facial and bulbar muscles. There is an 85% female predominance.[3] More rarely antibodies directed against the low-density lipoprotein receptor -related protein 4 (Lrp4 Antibody-Associated MG) (Lrp4-MG), are present in 2–50% of the so-called double seronegative MG cases.[3,14] “Seronegative” MG (SNMG) is a heterogeneous group of patients who share negative results for AChR and MuSK antibody testing. It is likely that this subgroup of patients has some other yet undetected antibodies.[7]

Clinical classification of MG is based on the Myasthenia Gravis Foundation of America’s Clinical Classification[9]: Class I: Any eye muscle weakness, possible ptosis, no other evidence of muscle weakness elsewhere. Class II: Eye muscle weakness of any severity, mild weakness of other muscles • Class IIa: Predominantly limb or axial muscles •

Class IIb: Predominantly bulbar and/or respiratory muscles Class III: Eye muscle weakness of any severity, moderate weakness of other muscles • Class IIIa: Predominantly limb or axial muscles • Class IIIb: Predominantly bulbar and/or respiratory muscles Class IV: Eye muscle weakness of any severity, severe weakness of other muscles • Class IVa: Predominantly limb or axial muscles • Class IVb: Predominantly bulbar and/or respiratory muscles (Can also include feeding tube without intubation) Class V: Intubation needed to maintain airway.[9]

These classification systems, though unwieldy, offer therapeutic and prognostic clues like the likelihood of response to steroids, probability of remission, relapse, exacerbation, generalization in the first six months and appearance of other autoimmune diseases.[10]

1.3 Sjogren's Syndrome:

Sjögren's syndrome (SS) is a chronic, autoimmune and multisystem disorder that affects the secretory glands, in particular, the lacrimal and salivary glands, producing xerophthalmia and xerostomia, respectively, which can lead to symptoms like dysphagia, difficulty articulating, dysphonia and flaccid dysarthria.[11] Additionally patients can present with a variety of extra glandular (systemic) manifestations such as arthralgia or arthritis, Raynaud's phenomenon, lymphadenopathy, lung disease, vasculitis, kidney disease, lymphomas, splenomegaly, peripheral neuropathy and myositis. This wide variety of signs and symptoms are due to autoimmune lesions of multiple organic systems such as the central nervous, vascular, joint, muscular, skin, lung, and kidney systems.[11]

Global incidence rates range between 3 and 11 cases per 100,000 patients, while the prevalence is around 0.01-0.72%.12 There is a 10:1 (women: men) prevalence ratio. Severe ocular involvement predominates in men, while systemic manifestations are much greater in women.[12]

Anti-SSA/Ro (anti-Sjogren's syndrome related antigen A autoantibodies) and Anti-SSB/La (anti Sjogren's syndrome type B) antibodies are distinctive markers in primary Sjögren's syndrome (pSS), found in 40–80% of patients.[12] Individuals with these antibodies, particularly anti-Ro/La, exhibit the highest prevalence of various systemic, hematologic, and immunologic alterations. Immunological studies commonly detect antinuclear antibodies (ANA), with anti-Ro/SSA being the most specific marker. Notably, anti-SSA/Ro and anti-SSB/La autoantibodies may be present in the serum long before the clinical manifestation of Sjögren's syndrome.

Genetic susceptibility to SS is linked to HLA class II markers. The association with HLA-DRB1*03 suggests that HLA alleles predispose individuals to autoantibody secretion, though without a clear connection to clinical outcomes. HLA-DR15 promotes the production of anti-SSA, while HLA-DR3 is linked to both anti-SSA and anti-SSB production. In a cohort of 400 SS patients, Garcia-Carrasco et al. demonstrated that antinuclear antibodies, anti-Ro/SSA antibodies, rheumatoid factor (RF), and anti-La/SSB antibodies are the most prevalent immunologic patterns.[13]

Both SS and MG are illustrative examples of diseases of dysfunctional self-recognition often producing multiple and heterogeneous autoantibodies against both nuclear and peripheral targets.

2. Case Report

extremities both proximally and distally. She was able to sustain a posture in the upper and lower extremities for 60 seconds indicating no fatigability. Fine motor movements were normal bilaterally. Sensation was intact to light touch, pinprick, vibration, and proprioception throughout. Reflexes were symmetrical in all muscles bilaterally. No dysmetria was noted on finger-nose-finger or heel-knee-shin. She had normal rapid alternating movements and fast finger tapping with normal amplitude and speed was able to be demonstrated.

Her single-count breath test was 26, which was normal.[14-1]*[1] Repetitive stimulation of the right abductor pollicis brevis was performed and found normal. Trains of six square wave pulses were applied through bipolar stimulation electrodes at a 3Hz frequency. No decrement in amplitude was observed in the compound motor action potentials, which is a normal result.[1]

Differential diagnoses were carefully considered. A normal creatine kinase level made muscular dystrophies less likely ruled out myopathiesA 26-year-old Hispanic female previously healthy and independent in her activities of daily living (ADL), with no past medical history or known family medical history, presented to the neurology department with the chief complaint of 6 months of gradual loss of voice, nasal speech, difficulty swallowing both solids and liquids and blurred vision. She denied aspiration events but admitted to occasionally choking on food. She denied weight loss and other constitutional symptoms like fever or night sweats. The patient reported that the symptoms started suddenly and gradually worsened over time. She denied any precipitating triggers like recent infection, surgery, or stress. She also denied known exposures to organophosphates or other chemicals, had not taken any recent medications, and no exposure to tick bites.

Upon admission, the physical examination revealed the patient to be a well-dressed, engaging woman, alert and oriented to person, place, and time. Her vital signs were all normal and she was breathing comfortably at 16 breaths per minute. Initially in the interview, it was noted that her speech was fluent, but she had mild difficulty articulating certain words and had difficulty controlling the pitch of her voice. She demonstrated a nasal quality to her speech. Over the course of the interview, her speech became more fatigued with an increased breath and nasal quality. The hoarseness of her voice was evident when asked to make a high pitched “eeee” sound. No anatomic abnormalities in the pharynx or larynx were visible. She was able to sustain a lateral eye gaze for 60 seconds and an upper eye gaze for 60 seconds without demonstrating fatigable diplopia or ptosis. Eyelid closure strength was normal. The visual acuity exam and fundoscopic evaluation were normal. Pupils were equal, round, and reactive and extraocular movements were intact.

Muscles of facial expression were symmetrically intact with normal sensation throughout the three branches of the trigeminal nerve, movements of the tongue were present without fasciculations, no lip trembling or drooling found positive during examination, gag reflex was present and normal, bedside swallowing test was normal with no choking present, there was no fatigability on the temporalis and masseter muscles. Hearing was intact bilaterally. Her neck flexor strength was normal indicating minimal risk for respiratory symptoms.

Peripheral muscle bulk and tone were normal, and strength was 5/5 in all four. The absence of weight loss and other systemic symptoms suggested the unlikely presence of an underlying neoplasm, while no history of skin rash eliminated dermatomyositis and lupus from consideration. She also denied any recent viral infections and episodes of diarrhea. Space-occupying lesions in the brainstem and Chiari malformation were ruled out by MRI and CT scans. Similarly, demyelinating diseases such as multiple sclerosis were excluded. A normal electromyography ruled out amyotrophic lateral sclerosis.

Furthermore, leptomeningeal carcinomatosis or lymphomatosis were also considered unlikely, due to the absence of pain and other related symptoms, and a normal cerebrospinal fluid analysis.

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[1] The single-count breath test (SCBT) is a bedside and inexpensive test in which the examiner asks the patient to take a deep breath and to count starting with the number one at a pace of approximately 2 numbers per second. The score is the last number counted before the patient had to take a second breath. It has shown moderate correlation with the forced vital capacity measured in spirometry. A score of 25 is considered normal but the ideal is to have a baseline score specific to each patient and measure it at every encounter.

Pertinent findings among the laboratory tests, (Table 1), included a negative test for Lyme's disease antibodies. Systemic connective tissue diseases were investigated, with an antinuclear antibody (ANA) test at a 1:320 dilution and Sjogren's SS-A/Ro were positive. Anti-SSB/La, rheumatoid factor, and anti-CCP were all negative. Antibodies to the acetylcholine receptor and blocking antibodies were both positive, confirming a diagnosis of Myasthenia Gravis. A computed tomography scan of the chest revealed normal thymus structures without evidence of thymoma or thymus hyperplasia.

In summary, we present a 26-year-old Hispanic woman with progressive bulbar symptoms exhibited by mild dysphagia, fatigable dysphonia and flaccid dysarthria with positive antibodies to the AChR in the setting of ANA and SSA/Ro positivity. A diagnosis of early onset myasthenia gravis and Sjogren's syndrome was made.

Hydroxychloroquine was initially started at 200mg when her antibodies for Sjogren's were reported as positive. However, within a few days it was discontinued after the acetylcholine receptor antibodies were reported, because of the potential impairment of neuromuscular conduction and muscle toxicity that may occur with hydroxychloroquine.15 Prednisone 40 mg daily was also prescribed until improvement was observed. For symptomatic treatment of her bulbar symptoms, the cholinesterase pyridostigmine bromide was initiated at a dose of 60 mg, two to three times a day.

Six weeks after initiation of treatment, the patient reported significant improvement in phonation and in nasal speech. However, a recess from steroids was attempted but aborted due to the return of symptoms and fatigue. As a result, prednisone was restarted at 60 mg daily, and mycophenolate was initiated at a dose of 500 mg, twice a day. She remains minimally symptomatic and much improved.

3. Discussion

Herein we report a case of a young Hispanic female patient with no previous medical history or family history of autoimmune diseases who co-presented with Type IIb generalized ACR Ab positive MG and SS.

This case illustrates the most common subtype of MG presenting in a young female patient with acetylcholine receptor binding and blocking antibodies. She is thus further categorized as generalized AChR Ab positive MG EOMG. This represents approximately 85% of MG patients. There is no apparent correlation between the level of antibodies and the severity of the disease.[17] While it is known that patients in this category have a higher incidence of thymic hyperplasia it was not detected in this case. Among the published literature, some articles says iIt is estimated that 50% of patients with a thymoma will eventually develop positive AChR antibodies without clinical manifestations, while approximately 30% will develop clinical MG,. while others says thymoma occurs in 10% to 12% of patients with MG, and 15% of thymoma patients have MG. Conversely, 10 to 20% of patients with MG either have at the time of diagnosis or will develop thymomas.[3] It is for these reasons that it is recommended that the thymus undergo surveillance every five years with imaging.[15]

As was evident in this case, the diagnosis of MG is mostly clinical with laboratory and imaging being confirmatory. The anti-AChR Ab test is very specific, and it confirms the diagnosis in patients with classical clinical findings.

Electrophysiologic tests are relevant in patients who are seronegative for antibody testing. Commonly employed tests for MG are the repetitive nerve stimulation test and single-fiber electromyography.[16] Both tests assess for conduction delays in the neuromuscular junction. Routine nerve conduction studies are usually performed to determine the functioning of the nerves and muscles before undertaking these tests.[16] Although these tests are relevant, they have limited sensitivity and specificity, especially in the cases where symptoms are limited to bulbar involvement, as they were in our patient's case.

Particularly relevant for ocular MG, the Edrophonium (Tensilon) Test is indicated. Edrophonium is a short-acting acetylcholinesterase inhibitor that increases the availability of ACh in the NMJ. Electrophysiologic testing is not applicable for ocular MG, so edrophonium is administered intravenously, and the patient is observed for improvement in symptoms of ptosis or diplopia. It has a sensitivity of 71% to 95% for MG diagnosis.[16]

Myasthenia gravis commonly coexists with other autoimmune disorders. Patients with MG may have inherited genes that make them more likely to develop other autoimmune conditions.[18] Worldwide, about 5 out of every 100 people have one or more autoimmune disorders while in patients with MG, 13 to 22 out of every 100 people have a second autoimmune condition indicating an underlying systemic immune disorder.[18] Autoimmune conditions like lupus, multiple sclerosis, and rheumatoid arthritis are much more common than MG. Out of 100,000 people with any autoimmune condition, only 35 will have MG.

In the case of the patient presented, who had generalized EOMG, other autoimmune pathologies include thyroiditis, lupus, type 1 diabetes, alopecia, giant cell myocarditis, myositis, red cell aplasia, autoimmune hepatitis, Sjogren's syndrome, Addison's disease, and Guillain–Barre syndrome must be considered and sought for.

Thyroiditis is the most common secondary autoimmune condition that people with MG have. Approximately 1 in 10 people with MG also have thyroiditis. Lupus occurs in between 1 and 8 out of 100 people with MG. Rheumatoid arthritis, dermatomyositis/polymyositis, and Addison's disease follow.[18, 19]

Treatment of MG must be individualized; however, the overall goal of treatment is to restore normal function and to minimize adverse effects of the disease. Treatment selection depends on many factors, including the distribution, duration, and severity of the disease. Among the most important factors to consider is patient preference. Guided shared decision making should consider the dosing schedule, route of administration e.g., infusion, costs, and insurance coverage.[28] The first-line medication used to treat MG patients is an inhibitor to acetylcholinesterase. Pyridostigmine is the most used acetylcholinesterase inhibitor, it works as a symptomatic therapy by increasing the amount of ACh in the synaptic cleft of neuromuscular junction, with a starting dose of 30 to 60 mg every 4-6 hours. Doses beyond 120 mg every 4 hours are not often effective and are more likely to cause cholinergic side effects, which include diarrhea, sweating, bradycardia, stomach cramps, and increased secretions. [17]

Immunotherapy is used to induce and maintain remission of symptoms, being considered the definitive form of treatment for MG. It aims to suppress the production of antibodies or the damage caused by them. Corticosteroids, such as prednisone, are a priority in treatment due to their high response rate, although their initiation may cause a temporary worsening of MG, so it is recommended to start with low doses and increase gradually.[29,30]

Retrospective studies have revealed a corticosteroid response rate between 70% and 80%, underscoring their importance and priority in the treatment of MG. Its use is recommended in combination with a corticosteroid-sparing agent. It is important to note that some patients may experience a temporary worsening of MG when high-dose corticosteroids are initiated. This worsening usually occurs between 4 and 10 days after the start of treatment and can sometimes trigger an attack.[29,30] It is recommended to closely monitor liver function, kidney function, blood count, and urinary biochemistry during treatment.[29,30]

Azathioprine and mycophenolate are considered the first-line immunosuppressive agent for MG, supported by evidence from randomized clinical trials and expert consensus. However, it is important to note that some patients treated with azathioprine may develop deficiency in the enzyme thiopurine methyltransferase (TPMT), which exposes them to an increased risk of adverse effects and may require the use of lower doses.[2] Rituximab, a monoclonal antibody directed against B cells, is used in patients with MG refractory to other treatments or in severe cases where conventional treatments have failed. Intravenous immunoglobulins are also used to suppress the immune response and may be effective in reducing mechanical ventilation time during myasthenic crises. [30,31]

Therapeutic plasma exchange (TPR) is used for seronegative MG and anti-MuSK MG, although its repeated use is not recommended to achieve prolonged immunosuppression in MG. [29,30,31] As in many cases, our patient initially responded with steroids and anticholinesterase therapy, but symptoms returned soon after reducing the dose of steroids, reason why. Reason why the final therapy consisted of pyridostigmine, corticosteroids and mycophenolate.

Interestingly, the patient was diagnosed simultaneously with Sjogren's syndrome (SS), which resulted in changes in her initial management since, paradoxically, hydroxychloroquine, used to treat SS symptoms, can exacerbate symptoms, unmask previously undiagnosed MG or precipitate MG. Chloroquine, a precursor of hydroxychloroquine, might stimulate the production of AChR antibodies, which act as immune checkpoint inhibitors (ICI), thereby exacerbating MG through a direct impact on neuromuscular transmission.[8] This overlap between MG and SS emphasizes the complexity of autoimmune diseases and the importance of considering coexisting conditions in patient evaluations.

Sjogren's syndrome (SS) is considered a complex disorder affecting multiple systems and presents diverse neurological manifestations. The documented occurrence of neurologic manifestations in SS varies between 5% to 57%.[20] About 36% of cases might solely involve the nervous system. Intriguingly, neurological signs may manifest before characteristic symptoms appear by as much as 6 years in 47% of cases and can overlap with other autoimmune pathologies like Myasthenia Gravis or Guillain Barre Syndrome. The neuropathy linked to SS often goes unnoticed, despite its prevalence.[20]

Delays in diagnosis are common as the nerve-related symptoms may appear before the broader systemic signs. Utilizing a minor salivary gland biopsy proves more effective in diagnosis compared to presently available blood markers.[20] However, the prognosis for those diagnosed with SS-associated neuropathy is not typically unfavorable in the future.[20]

Multiple simultaneous autoimmune disorders present challenges in treating MG due to overlapping symptoms and the need for multiple immune system drugs.[18, 21]

In the case discussed, the patient was initially administered hydroxychloroquine. However, this treatment was halted immediately after a diagnosis of Sjögren's syndrome (SS) was made. Consequently, the patient exhibited only mild symptoms of SS, which were primarily neurological, such as dysphagia and difficulties in swallowing. These symptoms are common in MG as well. Notably, the patient did not experience symptoms related to the secretory glands, such as xerostomia or xerophthalmia, indicating she did not need any other treatment. This allowed for the successful management of SS with steroids and mycophenolate mofetil. Fortunately, these medications are also used in the treatment of MG, which eliminated the need for multiple drugs.

Most patients with MG have a near-normal lifespan with the current treatment modalities. Morbidity results from the intermittent muscle weakness leading to aspiration pneumonia and the adverse effects of medications. Age of onset (<40 years), early thymectomy, and administration of prednisolone are found to be associated with reduced risk of relapse.[22] However, patients with concomitant autoimmune disease showed a high rate of relapse.[22] Severe morbidity due to Sjogren's syndrome is uncommon in patients with both diseases. Thus, controlling MG is the critical aspect of treatment.

Considering the findings presented by Pierce et al. in their epidemiological investigation of swallowing disorders in Sjogren's Syndrome (SS), it is plausible to consider that the patient's symptoms were a result of both diagnosed pathologies. The prevalence of a current self-reported swallowing disorder in SS patients, as reported, was 64.4%. Notable symptoms associated with this include taking smaller bites, thick mucus in the throat, difficulty placing food in the mouth, and wheezing while eating. Furthermore, additional risk factors such as the presence of a voice disorder, frequent neck or throat tension, and frequent throat clearing could have compounded the patient's dysphagia.[23]

Considering these factors in conjunction with the patient's MG, which itself can cause muscle weakness affecting swallowing, it becomes increasingly evident that her symptoms likely stem from a complex interplay of both conditions.

A comprehensive literature review was done to contextualize our patient's case within the broader landscape of concurrent MG and SS. As of 2020, there have been approximately 20 case reports documenting the co-occurrence of these two conditions. Notably, most of these cases have been reported in countries like China, India, Germany, and the United States.[24] In India, while there have been multiple reports of Myasthenia overlap, only one case has been definitively identified as MG coexisting with Sjogren's.To the best of our knowledge, there have been no reported cases of patients of Hispanic origin with this particular combination of diagnoses in the existing literature.

The most recent contribution to this field is a 2022 report indicating an ongoing interest and recognition in the medical community regarding the intersection of these two diseases titled "Association of early-onset myasthenia gravis and primary Sjögren's syndrome: a case-based narrative review," published in the Clinical Rheumatology journal.[26] This indicates an ongoing interest and recognition in the medical community regarding the intersection of these two diseases.

This article highlights the rarity and complexity of managing a patient with both Myasthenia Gravis and Sjogren's Syndrome, particularly in underrepresented populations given that these communities often encounter various obstacles in obtaining health care and medical treatments, it is important to note that Hispanic adults generally have lower rates of health insurance coverage and access to preventive medical services compared to other American groups.[27] Barriers related to language and culture, along with issues like increased poverty rates, especially among recent immigrants from Hispanic backgrounds, play a significant role in the differing health results observed within the Hispanic population in America.[27] Disparity outcomes are well known between Hispanic Americans vs. other groups and it is estimated that 44% of this is related to communication and cultural barriers.[27] It is interesting to note that this patient drove from over 500 miles away to our clinic because she heard that care was rendered in Spanish in a culturally sensitive manner.

Table 1: Patient's laboratory results:

Laboratory	Patients Results	Reference Interval
Acetylcholine Receptor Ab, All	-	-
AChR Binding Abs, Serum	3.65	Negative: 0.00 - 0.24 Borderline: 0.25 - 0.40 Positive: >0.40
AChR Blocking Abs, Serum	68	Negative: 0 - 25 Borderline: 26 - 30 Positive: >30
Lyme Total Antibody CIA	Negative	Negative
ANA Direct	Positive	Negative
Anti-DNA (DS) Ab Qn	1	0 - 9
RNP Antibodies	<0.2	0.0 - 0.9
Smith Antibodies	<0.2	0.0 -0.9
Sjogren's Anti- SS-A	>8.0	0.0 - 0.9
Sjogren's Anti-SS-B	0.2	0.0 - 0.9
Phosphorus	4.5	3.0 - 4.3
PTH	34	15 - 65

Laboratory	Patients Results	Reference Interval
Cell Count, CSF	-	-
Color	Colorless	Colorless
Clarity	Clear	Clear
Nucleated Cell	1	0 - 5
RBC	650	None Seen
Comment	Rare lymphocyte seen	

Preexisting health conditions are also seen as a factor: 40% say a major reason for worse health outcomes is that Hispanic people are more likely to have preexisting conditions.[27] Also, health care providers being less likely to give Hispanic people the most advanced medical care and that hospitals and medical centers giving Hispanics' well-being lower priority are a major reason for health disparities.[27] All these underscore the need for continued reporting of such cases to enhance our understanding and improve the diagnostic and therapeutic approaches for similar patients in the future.

Laboratory	Patients Results	Reference Interval
Glucose, CSF	61	49 – 73
Protein, Total, CSF	12.1	0.0 - 44.0

Table 2: Differential Diagnosis of MG

Diagnosis	Differentiating clinical features
Thyroid eye disease	Exophthalmos
Motor neuron disease	No ocular involvement, upper motor neuron features, muscle wasting.
Botulism	Pupillary involvement
Congenital cranial nerve palsies.	In distribution of cranial nerves
Myopathies	Muscle weakness, including ocular or bulbar muscle weakness that can mimic MG.
Myositis	Muscle weakness with common constitutional symptoms such as fever and weight loss.
Guillain-Barre Syndrome	Muscle weakness shown with an ascending pattern. Autonomic nervous system involvement, diminished or no reflexes, sensory signs and symptoms
Lambert-Eaton myasthenic syndrome	Spared ocular muscles. Hyporeflexia and involvement of autonomic nervous system.
Cytopathies (mitochondrial)	There can be fluctuations in mitochondrial disorders e.g. with increase in metabolic demands, such as in illnesses. Clinical features that can help differentiate with MG, is the involvement of other systems such as cardiac, ocular (other than extraocular muscle and eyelid motility), GI, cognitive impairment and neuropsychiatric symptoms, and seizures.
Oculopharyngeal muscular dystrophy	Tongue weakness or atrophy. Dysphagia (with solid foods)
Congenital myasthenic syndromes	No response to immunotherapy. Onset in childhood. Seronegativity

Adapted from Sathasivam S. Diagnosis and management of myasthenia gravis. Prog Neurol Psychiatry. 2014;18(1):6-14. doi:10.1002/pnp.315, table no. 2.

Table 3: Etiology of Oropharyngeal Dysphagia

Category	***Diseases / Conditions***
Neurologic	Stroke, Parkinson's, MS, ALS, Alzheimer's, Huntington's
Myopathic	Myositis, Dermatomyositis, Muscular dystrophies
Metabolic	Hyperthyroidism, Advanced diabetes
Inflammatory/Autoimmune	Amyloidosis, Sarcoidosis, SLE, Sjogren's, Myasthenia Gravis, Rheumatoid arthritis
Infectious	Meningitis, Diphtheria, Botulism, Lyme, Syphilis, Various viral infections, HIV/AIDS

Structural	Inflammatory (Pharyngitis, Abscess, Tuberculosis), Congenital Webs, Zenker Diverticulum, Neoplasms, Compression, Eosinophilic esophagitis, Bullous Skin Diseases.
Iatrogenic	Drug side effects, Radiation, Corrosive injury

Adapted from Gasiorowska, Anita & Fass, Ronnie. (2009). Current Approach to Dysphagia. Gastroenterology and Hepatology. 5.

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Protection of human and animal subjects. Informed consent was obtained from the patient for publication of this case report.
Confidentiality of data. No data that identifies patients are revealed.

Note from authors: In addressing the dual diagnosis of Myasthenia Gravis and Sjogren's Syndrome in our Hispanic patient, we, as a predominantly Hispanic group of authors, bring a personal and professional understanding of the ethical, legal, and cultural dimensions critical to providing effective and empathetic care. Ethically, we prioritize culturally competent care, ensuring our approach respects the patient's cultural values and beliefs, thereby enhancing patient trust and treatment adherence. Legally, we adhere to informed consent and confidentiality, employing language services and culturally tailored materials to ensure the patient's full understanding and participation in their care.

Culturally, we recognize and address the barriers Hispanic patients often face in healthcare, such as language barriers and cultural stigmas, through empathetic engagement and integrating traditional health practices where appropriate. Our shared cultural background with the patient enriches our perspective, allowing us to navigate these complexities with sensitivity and insight, aiming to reduce health disparities and promote equitable care. This commitment reflects our dedication to advancing health equity and underscores the importance of culturally informed research and practice in medicine.

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A Case of a 65-year-old woman with Vitiligo and Diabetes presenting with Severe Autoimmune Hepatitis

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ABSTRACT
Autoimmune hepatitis (AIH) is a chronic liver disease with diverse clinical presentations and significant global variation in prevalence. AIH predominantly affects females and commonly manifests with nonspecific symptoms such as fatigue and malaise, often accompanied by extrahepatic autoimmune disorders. Here, we present the case of a 65-year-old Hispanic woman with vitiligo, type II diabetes mellitus, and severe AIH. Despite extensive diagnostic workup, including serological testing, the cause of this patient's hepatitis proved to be a challenge. Eventually, autoimmune testing revealed positive anti-smooth muscle antibodies and an elevated IgG, prompting percutaneous liver biopsy, which confirmed mild to moderate active hepatitis with mixed inflammatory infiltrate. Despite there not being a standardized diagnostic criterion for autoimmune hepatitis, the interdisciplinary hospital team agreed that the most likely diagnosis was autoimmune hepatitis, given her constellation of symptoms, serologic testing, and liver biopsy results. Treatment with prednisone was initiated, leading to clinical improvement. This case underscores the importance of a thorough diagnostic workup in suspected AIH cases, especially in patients with concomitant autoimmune conditions, to facilitate timely management and improve patient outcomes. It also highlights the need for a consensus among diagnostic criteria for autoimmune hepatitis.

Keywords: *Autoimmune Hepatitis, Vitiligo, Jaundice*

1. Introduction

Autoimmune hepatitis is a chronic immune-mediated liver disease that presents with a variety of clinical presentations ranging from asymptomatic to fulminant hepatic disease.[1,2] It is a relatively rare disease with significant worldwide variation, with a global prevalence of 15.65 cases per 100,000 inhabitants.[2] While groups of patients have been reported in other countries, such as South America, these patients have not been sufficiently studied to determine the prevalence of the disease.[1,2] The disease predominantly affects females with a 3:1 female-to-male ratio, and the average age of diagnosis occurs around 40 years old1. If untreated, the 5-year survival rate is less than 25%; if appropriately treated, the 10-year survival rate is approximately 90%.[3]

Clinically, one-third of patients present with acute icteric hepatitis and cirrhosis, while the majority present with mild or subclinical disease.[1] Many patients report associated symptoms of fatigue, malaise, loss of appetite, and arthralgias1. Patients may present with extrahepatic autoimmune disorders such as Hashimoto thyroiditis, vitiligo, type 1 diabetes mellitus, systemic lupus erythematosus, and rheumatoid arthritis–the strongest association being Hashimoto thyroiditis.[1]

In 2008, the International Autoimmune Hepatitis group developed a scoring system for clinical practice, which included four key features of the disease: hypergammaglobulinemia, autoantibodies, histology, and the absence of viral hepatitis. Characteristically, patients present with elevated IgG and normal IgM and IgA1. Patients may have positive antinuclear antibodies (ANA), smooth muscle antibodies (SMA), and antibodies to liver-kidney microsomes (LKM), all of which are not disease-specific.[1,4] On the other hand, antibodies to soluble liver antigen/liver-pancreas (SLA/LP) are disease-specific but are only present in a small portion of adult patients.[1]

On histology, typical autoimmune hepatitis includes interface hepatitis, portal, and periportal inflammation, presence of plasma cells, rosetting of hepatocytes, and emperipolesis (i.e., active penetration by one cell into and through a larger cell)[5,6] While vitiligo has been associated with autoimmune diseases, including type 1 diabetes mellitus, thyroiditis, and inflammatory bowel disease7,8, the association between type 2 diabetes mellitus and autoimmune hepatitis has not been adequately examined. Here, we present a case of a 65-year-old female with vitiligo, type 2 diabetes mellitus, and autoimmune hepatitis.

2. Case Presentation

The patient is a 65-year-old Hispanic female with a past medical history of diabetes mellitus II, vitiligo, hypertension, coronary artery disease, and dyslipidemia. She presented to the emergency department complaining of dizziness, nausea, non-bloody emesis for the past three days, and scleral icterus. On admission, the patient had a temperature of 36.7, pulse of 105, respiratory rate of 18, and blood pressure of 122/74. On physical exam, she had scleral icterus and diffusely jaundiced skin without bronzing or malar rash. The rest of the physical exam, including a neurological exam, was unremarkable. Initial labs showed anemia with a hemoglobin of 10.9, hematocrit of 32.5, WBCs of 6.7, and regular coagulation studies. Initial BMP showed hyponatremia at 130, creatinine at 1.09, and elevated glucose at 176. Hemoglobin A1C was 8.6%. Liver function studies were significant for ALT of 1504, AST of 1768, alkaline phosphatase of 837, total bilirubin of 8.5, direct bilirubin of 6.9, indirect bilirubin of 1.6, LDH of 497, and ammonia level of 57. TSH and ceruloplasmin were normal. Her brain CT was normal. An abdominal pelvic CT with IV contrast demonstrated right upper quadrant fat stranding adjacent to the gallbladder, possibly representative of cholecystitis, duodenitis, or peptic ulcer disease. There was a markedly enlarged porta hepatis with retroperitoneal lymph nodes, which were nonspecific. A right upper quadrant ultrasound revealed findings of possible cholecystitis. A HIDA scan demonstrated non-visualization of the small bowel, which raised suspicions about possible common bile duct obstruction.

MRCP showed acute hepatitis/acute hepatocellular disease with signs of periportal edema, gallbladder wall edema, and a trace amount of perihepatic fluid, negative for choledocholithiasis, and enlarged portocaval and porta hepatic lymph nodes, which were likely reactive. There was no evidence of obstructive cholangiopathy or choledocholithiasis. Portal hepatic Doppler showed slowed velocity in the main portal vein with mild splenomegaly, suggesting mild portal hypertension. The echocardiogram showed an ejection fraction of 55-60%. The hepatic synthetic function was well-preserved. Several days after admission, the patient's liver enzymes remained elevated, although they seemingly had plateaued. Antibody and antigen studies for CMV, EBV, Hepatitis C, B, and E were negative. HIV and QuantiFERON TB testing were also negative. Acetaminophen, salicylate, and alpha-1-antitrypsin were all negative. Copper levels were slightly elevated.

Since initial studies for the etiology of the elevation in LFTs and hyperbilirubinemia had been negative thus far, autoimmune testing was done. The patient had positive anti-smooth muscle antibodies, antimitochondrial antibodies, and elevated IgG, so there was high suspicion of autoimmune hepatitis. She underwent percutaneous liver biopsy by interventional radiology. An emphasis was placed on testing for cell inclusions/heme deposits, specific immune testing for HSV, autoimmune hepatitis, and Prussian blue staining for hemochromatosis. Results of the biopsy showed mild to moderate active hepatitis with mixed inflammatory infiltrate (Figure I, II). There was no iron deposition or minimal fibrosis, but many inflammatory cells, including plasma cells, could indicate an autoimmune etiology (Figure III, IV). There were also eosinophils present. DNA testing for the most common HFE mutations for hemochromatosis was also negative. The differential diagnosis included autoimmune hepatitis versus drug-induced liver injury secondary to glipizide versus hemochromatosis. The patient was started on prednisone 40 mg daily following recommendations from the gastroenterology team and was discharged with the plan for her to have an outpatient follow-up with a gastroenterologist, ideally with a hepatologist.

Four months after the patient's discharge, she is feeling better. She was initially treated with prednisone 20 mg two tablets twice a day for a month. Then, one month and a half later, she was switched to azathioprine 500 mg oral daily. Her jaundice has resolved and her right upper quadrant abdominal pain has improved.

Figure 1: Liver biopsy showing portal plasma cell-rich inflammation, interface hepatitis, and lobular chronic inflammation typical of autoimmune hepatitis.

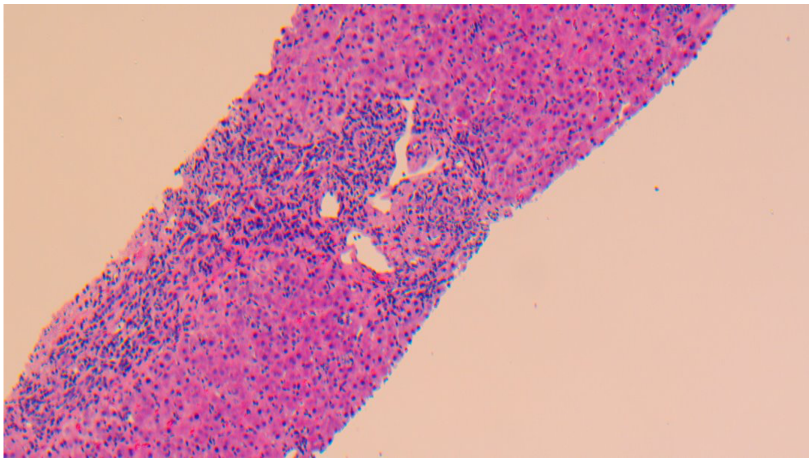


Figure 2: Closer magnification portal plasma cell-rich inflammation, interface hepatitis, and lobular chronic inflammation typical of autoimmune hepatitis.

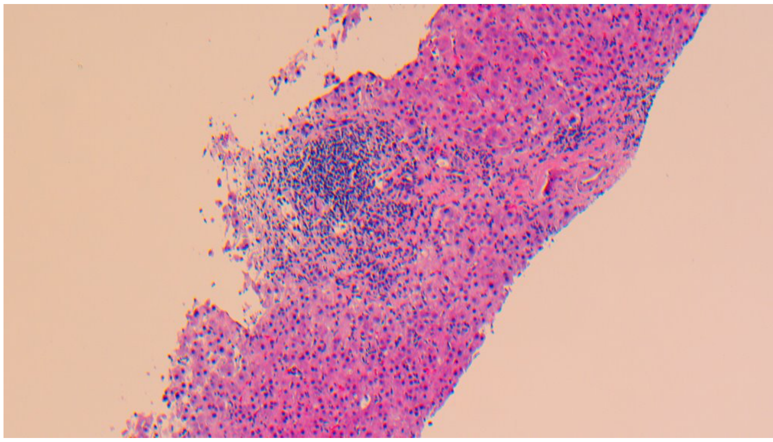


Figure 3. Closer magnification of portal area with lymphocytic infiltrate and interface hepatitis with multinucleated giant cell (arrow).

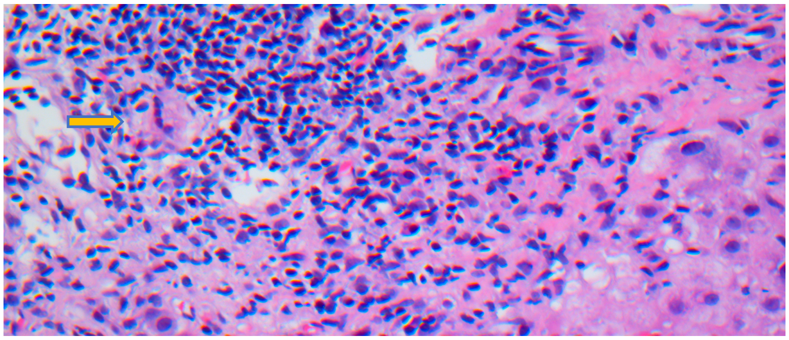
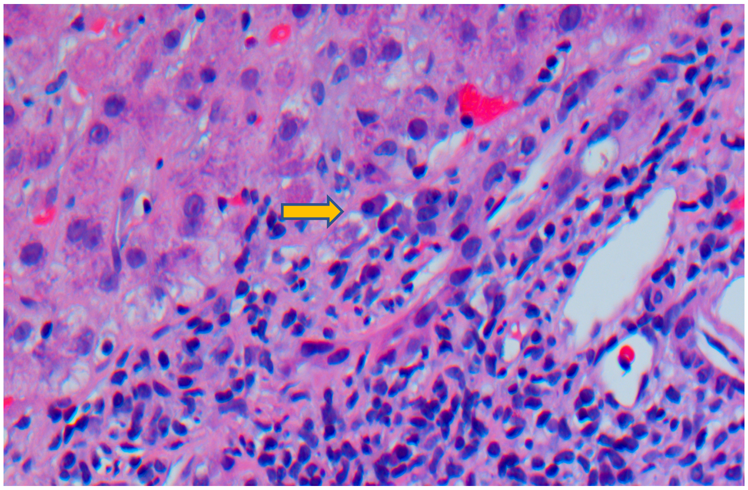


Figure IV. Plasma cells (arrow)



3. Discussion

Autoimmune hepatitis is a rare autoantibody-mediated inflammatory disease of the liver.9. While practical therapeutic guidelines have been clinically demonstrated for 60 years, AIH remains a diagnostic challenge. AIH can be divided into types 1 and 2.[10] Type 1 is associated with ANA, ASMA, and IgG antibodies and is typically diagnosed in the fifth or sixth decade of life11. Type 2 is associated with anti-liver-kidney microsomal antibody type 1 (anti-LKM1) and anti-liver-cytosol type 1 (anti-LC1) and is commonly diagnosed in children.[11-13] Histology and liver enzymes are frequently required to exclude other causes of liver disease. While AIH is associated with a variety of histologic findings, there are no pathognomonic features6. Instead, clinicians must rely on clinical, serological, and pathologic features to diagnose AIH. Histologic findings of AIH include portal lymphoplasmacytic inflammation, lobular hepatitis, emperipolesis, and rosettes[5-14]. Liver enzymes are significantly elevated, with aminotransferases being disproportionately elevated[15,16]. AIH has been associated with other autoimmune conditions, including psoriasis, rheumatoid arthritis, Sjogren's, IBD, hypothyroidism, and SLE[7,8,15,17]. The pathogenesis of AIH has been hypothesized as a result of several mechanisms, including autoantigen exposure, genetic predisposition, and defective immunoregulatory mechanisms[18]. Czaja specifies that class II major histocompatibility complex (MHC) with lysine at position Drbeta71 is the culprit of autoantigen presentation in AIH. Lohse1 demonstrated different HLA subtypes associated with AIH based on geographic and ethnic groups. First-line treatment is a glucocorticoid with or without azathioprine until the patient improves clinically and liver enzymes return to baseline[1,11] The clinician should decide on the length of treatment based on remission and complete resolution of symptoms.

Vitiligo, a skin condition caused by selective loss of epidermal melanocytes, is the most common depigmentation disorder worldwide, with a prevalence of 0.5-2%[19,20]. Vitiligo is a multifactorial disorder associated with a variety of etiologies, including stress, family history, and autoimmune disorders[19-22]. Cumali et al. reported two patients with vitiligo and AIH and primary biliary cirrhosis overlap syndrome (AIH/PBC)23. Seiglie et al.,[24] also examined the relationship of AIH/PBC to vitiligo, emphasizing the need to investigate this variant form and underlying pathogenesis further. The incidence of AIH/PBC23-25 overlap and its distant association with extrahepatic conditions may warrant further workup to determine the etiology and possible association with vitiligo and other conditions. Kern et al. reported on a T2DM patient with vitiligo who developed autoimmune hepatitis secondary to initiation of liraglutide therapy[25.]

While some studies have shown an association between AIH and both types of diabetes mellitus26,27, the relationship between vitiligo and autoimmune hepatitis with type 2 diabetes mellitus has not been adequately studied. This triad of conditions could be causally linked based on the autoimmune hypothesis of the conditions.

The prevalence of AIH is 38.7 per 100,000 cases in Caucasian patients and 41.5 per 100,000 cases in Hispanic patients28. The odds of AIH diagnosis are higher in Latinx patients compared to the White patients reference group (OR 25, $P < 0.05$)29,30. Additionally, upon initial presentation, Latinx patients have more severe disease and a higher prevalence of cirrhosis30. Furthermore, a systematic review and meta-analysis conducted by Chang et al. demonstrates that vitiligo is significantly associated with both type 1 and 2 diabetes mellitus (OR 2.899, $P = 0.001$ and OR 2.371, $P < 0.001$, respectively)31. The association between vitiligo and type 1 DM is likely due to autoreactive cytotoxic T-cell-mediated destruction31. The pathogenesis for the association between vitiligo and type 2 DM is not very clear, but one hypothesis is that the oxidative stress from type 2 DM may cause apoptosis of melanocytes and lead to the development of vitiligo31,32. Vitiligo is also associated with autoimmune hepatitis3. In a systematic review of cutaneous diseases related to AIH, Beretta-Piccoli et al. concluded that the most common skin conditions in AIH patients are vitiligo, psoriasis, and alopecia areata3. Kern et al. reported on a T2DM patient with vitiligo who developed autoimmune hepatitis secondary to initiation of liraglutide therapy[25]. While some studies have shown an association between AIH and diabetes mellitus,[26,27] the relationship between vitiligo and autoimmune hepatitis with type 2 diabetes mellitus has not been adequately studied.

In this patient's case, there was a question of whether this was truly AIH versus drug-induced hepatitis due to the findings of eosinophils in the biopsy. For autoimmune hepatitis, the diagnostic criteria include autoantibodies, hypergammaglobulinemia, and interface hepatitis on histology[27,28]. The patient had autoantibodies, elevated IgG, and mild interface hepatitis on the pathology report. The report also noted a high presence of inflammatory cells, including significantly elevated plasma cells, indicating autoimmune hepatitis. Although eosinophils were present, which could indicate drug-induced hepatitis, other etiologies, including autoimmune hepatitis, need to be ruled out before diagnosing drug-induced hepatitis[27,29]. This patient’s medications were also discontinued during her hospitalization, and her LFTs never reached normal or near normal levels, which also decreases the likelihood of this being a drug-induced hepatitis.

4. Conclusion

Identifying autoimmune hepatitis presents a challenge to clinicians due to the diversity of hepatic etiologies that need to be excluded and the constellation of symptoms that can initially present. This case demonstrated the complexity of the workup required to diagnose someone with autoimmune hepatitis. This patient had significantly elevated LFTs, LDH, alkaline phosphatase, and bilirubin, which prompted the workup for a hepatic versus cholecystic origin. The patient underwent extensive testing to rule out infectious, genetic, and autoimmune etiologies for hepatitis. All other etiologies must be excluded before diagnosing autoimmune hepatitis, including drug-induced hepatitis. Clinicians need to do a thorough workup to exclude underlying causes such as tuberculosis, HIV, and viral hepatitis and to do a rigorous medication review also to rule out drug-induced hepatitis. When trying to make the final diagnosis of autoimmune hepatitis, it was noted that there is no set diagnostic criteria or consensus on how to make a diagnosis. Several diagnostic recommendations are in place; however, many of them conflict with one another. Future recommendations would be to create a consensus using a combination of expert opinions and existing evidence to formulate a standardized diagnostic criterion for autoimmune hepatitis. This could make the diagnostic process more accessible and streamlined for clinicians and patients and decrease the chances that patients with this condition will be missed.

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Hispanic Faculty Trends in U.S. Medical Schools: A 50-Year Perspective

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ABSTRACT

The U.S. Hispanic population has grown substantially over the past 50 years, and simultaneously, the number of U.S. medical schools and medical school faculty has increased. This study examines the trends for Hispanic faculty in clinical and basic science departments at U.S. medical schools.

Method

This retrospective, cross-sectional observational study analyzed data from the Association of American Medical Colleges Faculty Roster for faculty at all LCME-accredited medical schools from 1973 to 2022. Proportions of faculty were compared according to department, sex, rank, and Hispanic status using a 2-independent-sample t-test and simple linear regressions.

Results

The percentage of Hispanic medical school faculty increased from 1.7% in 1973 to 5.4% in 2022, with similar rates of increase in basic science and clinical departments. In 2022, departments with the highest representation of Hispanic faculty included family medicine and obstetrics and gynecology. The departments with the lowest representation of Hispanic faculty were orthopedic surgery and otolaryngology. In 2022, only 1.5% and 3.1% of all full professors were Hispanic females and males, respectively.

Conclusion

There was a minimal increase in the percentage of Hispanic faculty in medical schools over the last 50 years, and the rank was disproportionally higher at the Assistant Professor level, particularly for females. The combination of a rapid increase in the U.S. Hispanic population and a slow increase in Hispanic faculty has resulted in Hispanic medical school faculty being more underrepresented in academic medicine in 2022 than in 1973.

1. Introduction

Fifty-three percent of the U.S. population growth in the last decade was attributable to the Hispanic population.1 One in six individuals, or 19% of the U.S. population, is Hispanic.2 Meanwhile, health disparities among Hispanics continue to increase, with Hispanics having higher rates of diabetes, hypertension, and uninsured status compared to White adults.3 In 2022, the American College of Physicians and the American Medical Association called for increasing racial diversity in the physician workforce as one crucial strategy to promote health equity.[3,4] Efforts to increase the racial diversity of physicians date back to the 1970s.[4] It is uncertain what impact these initiatives have had on the representation of Hispanic faculty in U.S. medical schools.

The racial demographics of medical school faculty are closely tied to the racial demographics of trainees. Unfortunately, Hispanics are significantly underrepresented among medical school applicants and matriculants, lagging nearly 70% behind the age-adjusted U.S. population.[5] An analysis by Martinez et al. in 2022 demonstrated a severe shortage of Hispanic resident physicians. Hispanic resident physicians comprise only 6% of the resident physician workforce, translating into 14 Hispanic resident physicians for every 100,000 Hispanics in the U.S. population compared to a national average of 37 residents for every 100,000 population.[6]

There are several reasons why Hispanic faculty are crucial for medical education. First, Hispanic faculty are vital for mentoring trainees. Hispanic trainees report that having mentors with a shared sense of history is essential and that they have a difficult time finding Hispanic faculty mentors.[7] Second, Hispanic faculty are essential for addressing the pressing issue of health disparities, as minority physicians are more likely to work in underserved areas.[8] Third, Hispanic physicians are more likely to speak Spanish than non-Hispanic physicians.[9] In 2010, 9% of the U.S. population had limited English proficiency, and two-thirds spoke only Spanish.[10] Improved patient communication has been demonstrated with race and ethnic concordance.[11]

Many programs have been launched to increase the number of minorities in medicine. [12-14] Fifty years have passed since President Nixon's administration passed the first legislation to promote diversity in medicine.[15,16] Over this period, preexisting and new medical schools significantly expanded in the 1960s and 1970s and from 2002 to 2018. Understanding the impact of the expansion in the number of medical school faculty and the numerous initiatives to increase the number of Hispanic physicians is critical.

Given the dynamics of rapid growth in the U.S. Hispanic population and the increase in the number of U.S. medical schools, in this study, we examined trends among Hispanic faculty in clinical and basic science departments at U.S. medical schools. We asked how rapidly the numbers of male and female Hispanic faculty are increasing, how this compares between departments, and whether appointments in academic rank are similar to non-Hispanic faculty. The definition of equal representation is that a workforce's racial makeup mirrors that group's representation in the population. The U.S. population is 19% Hispanic. Therefore, we asked how close we are to having 19% Hispanic medical school faculty.

2. Method

This retrospective observational study did not involve human research participants and was deemed exempt from review by the University of Chicago Institutional Review Board. We examined the racial diversity of all full-time faculty in basic science and clinical departments at every Liaison Committee on Medical Education (LCME)-accredited U.S. medical school. We chose 50 years (from 1973 through 2022) to include periods of expansions of pre-existing and new medical schools.

2.1 Data collection

For this cross-sectional study, we used data from the Association of American Medical Colleges (AAMC) Faculty Roster, a comprehensive national database of all full-time faculty in clinical and basic science departments at LCME-accredited U.S. medical schools. We obtained this data in October 2023 through the FAMOUS (Faculty Administrative

Management Online User System) online portal. Variables extracted from the FAMOUS dataset included race/ethnicity, gender, academic rank, and medical specialty. We examined trends in Hispanic and non-Hispanic faculty by obtaining these variables for each faculty member for every year between 1973 and 2022. We divided faculty into four demographic groups: Hispanic males, Hispanic females, non-Hispanic males, and non-Hispanic females. In the AAMC Faculty Roster, Hispanics are self-reported as being of Hispanic or Spanish origin. The Roster does not allow the designation of a specific nationality and groups all the following together: Argentinean, Colombian, Cuban, Dominican, Mexican, Mexican American, Chicano/Chicana, Peruvian, Puerto Rican, Other Hispanic, or another Spanish origin. Due to the limitations of the data source, for this analysis, all Hispanics were combined in one category, including those of White and Black races. Sex is used to classify a person as male or female according to the reproductive organs and chromosome complement. In this study, we use gender to refer to a person's self-representation as male or female, as the dataset variable is self-reported. Non-full-time faculty (e.g., part-time or volunteer faculty) were excluded from this analysis because this information was considered incomplete and unreliable. We also excluded the small number of faculty members whose gender was not reported, or the department was not identified.

2.2 Outcome measures

The primary outcome measures were the numbers and proportions of faculty by gender, ethnicity (Hispanic, non-Hispanic), and academic rank (Assistant Professor, Associate Professor, Full Professor) yearly between 1973 and 2022. Through this 50-year analysis (from 1973 to 2022), we aimed to identify long-term trends during substantial faculty expansion nationally.

2.3 Statistical analysis

We performed a 2-independent sample *t-test* to compare faculty subgroup proportions for each department for 1973, 1997, and 2022. A simple linear regression model was fitted for each department, where the year was an independent variable. We used regression slopes to capture annual rates of change in the proportions of faculty by gender and rank. The 95% confidence intervals (CIs) for the slopes allowed us to determine statistically significant differences across departments over the years. All P values were 2-sided, and we considered a $P < .05$ statistically significant. We conducted statistical analyses with SAS version 9.4 (SAS Institute, Cary, North Carolina). We determine the representation of Hispanic faculty compared to Hispanics in the U.S. population using a representation quotient (RQ) adapted from the work of Lett and colleagues.[5] An RQ of 1 suggests equitable representation of Hispanic faculty relative to their representation in the U.S. population; an RQ greater than 1 indicates overrepresentation, and an RQ less than 1 indicates underrepresentation.

3. Results

3.1 Rise in Hispanic faculty

Expansion of pre-existing and new medical schools led to a 483.0% (from 34,380 to 200,551) increase in all medical school faculty from 1973 to 2022. During the same time, Hispanic faculty increased in the basic science (from 126 to 931; 638.9%) and clinical (from 381 to 9,861; 1950.1%) departments. This percentage increase in Hispanic faculty was significantly higher than that of non-Hispanic faculty in basic science (from 7,339 to 17,129; 133.4%) and clinical (from 20,324 to 147,677; 626.6%) departments. However, although the raw numbers of Hispanic faculty increased, as a percentage of all faculty, Hispanic representation increased during this period in basic science from only 1.7% to 5.2% and in clinical departments from 2.3% to 6.3%.

3.2 Increasing underrepresentation of Hispanic faculty

In 1973, 5% of the U.S. population was Hispanic, and 2.1% of medical school faculty were Hispanic, giving a representation quotient of 0.42. In 2022, 19% of the U.S. population was Hispanic, and 6.3% of medical school faculty were Hispanic, giving a representation quotient of 0.33. The lower the representation quotient, the more underrepresented a population is. Therefore, a decrease in the RQ from 0.42 to 0.33 indicates that Hispanic faculty are more underrepresented in 2022 than in 1973.

3.3 Gender distribution of Hispanic faculty

Hispanic faculty in basic science departments were predominately males in 1973. Growth in the number of Hispanic faculty led to more Hispanic females becoming basic science faculty, although the entry of new female faculty remained lower than males. By 2022, the percentages of Hispanic faculty in basic science departments remained slightly higher for males than females (2.9% versus 2.3%; $P < .001$).

Fig. 1 depicts changes in the percent (**Fig. 1A**) and number (**Fig. 1B**) of male and female medical school faculty yearly from 1973 to 2022. The annual number of Hispanic faculty who were males increased slightly more than for females (+ 110.5 Hispanic males versus +90.7 Hispanic females per year; trend $P < .001$). By 2022, the percentage of all faculty who were Hispanic males was slightly higher than Hispanic females (3.4% versus 2.8%, $P < .01$).

3.4 Hispanic faculty in specific departments

The number of Hispanic faculty increased in all medical school departments. The distribution of Hispanic faculty in departments is compared for 1973, 1997, and 2022 (**Fig. 2**). Since 1973, all clinical and basic science departments significantly increased Hispanic faculty. In 2022, the clinical departments with the highest percentages of Hispanic faculty were family medicine, obstetrics and gynecology, and pediatrics, while the lowest rate of Hispanic faculty was in orthopedic surgery, otolaryngology, radiology, and ophthalmology. The distribution of Hispanic faculty was similar in all basic science departments. In 2022, Pathology had the most Hispanic faculty among basic science departments, and biochemistry had the least.

3.5 Academic ranks of Hispanic faculty

Fig. 3 depicts academic rank (Assistant Professor, Associate Professor, and Full Professor) among Hispanic and non-Hispanic faculty in U.S. medical schools from 1973 to 2022. Since 1973, there has been an increase in Hispanic female Assistant and Full Professors and a decrease in Hispanic male and female Associate Professors. Hispanics are more likely to hold the rank of Assistant than Associate or Full Professors. Hispanic males were more likely to have a higher rank than Hispanic females. Compared to non-Hispanic males, Hispanic males were consistently more likely to be Assistant Professors and less likely to be Full Professors. In 2022, only 3.1% of all Full Professors were Hispanic males (n=1,263), and 1.5% were Hispanic females (n=601).

4. Discussion

The growth of the U.S. Hispanic population has outpaced that of all other ethnic groups, increasing from 5% to 19% over the last 50 years.[1] Therefore, we comprehensively analyzed trends among Hispanic faculty in U.S. medical schools. Fifty years was chosen to include times of expanding faculty at new and pre-existing medical schools and to capture the effects of Affirmative Action. Our results indicate that the number of Hispanic medical school faculty members grew in all basic science and clinical departments during this period. However, the percentage increase in Hispanic faculty over 50 years was slow (from 1.7% to 5.2% for basic science departments and 2.3% to 6.3% for clinical departments). The representation quotient for Hispanic faculty is worse in 2022 than in 1973. At this rate, the representation of Hispanic faculty is unlikely to ever reach parity with Hispanics in the U.S. population.

Our findings concerning Hispanic faculty are consistent with those of Mora et al. regarding medical students, who reported that it would take 92 years of sustained doubling of the number of enrolling Hispanic students to correct the deficit of Hispanic physicians in 2015.[17] The low Hispanic representation amongst basic science faculty is equally concerning. Given these minimal rates of increase in Hispanic faculty compared to the growth in the U.S. Hispanic population, we must reconsider our efforts to increase the number of Hispanics in academic medicine and critically evaluate which strategies have worked and which have not.

4.1 Variation between departments

It was encouraging that all departments demonstrated increased Hispanic faculty members during the 50-year study period. However, the representation of Hispanic faculty across clinical and basic science departments was highly variable. Our results indicate that two of the largest specialties (pediatrics and internal medicine) contributed nearly half of the overall pool of Hispanic faculty in clinical departments. Our data analysis shows that three specialties (ophthalmology, otolaryngology, and dermatology) had less than 85 Hispanic faculty members each. Obstetrics and Gynecology is one of the specialties with the most significant increase in the percentage of Hispanic female faculty, with an over 5-fold increase in 30 years.[18] Similar variation has been reported in graduate medical education, with psychiatry having the highest representation of Hispanic residents and ophthalmology having the lowest.[19] In otolaryngology in 2017, among 1,596 residents, only 98 were Hispanic.[20]

Several specialties with low representation of minority physicians have put forth targeted strategies to increase the recruitment of Hispanic physicians. In orthopedic surgery, V.H. Hernandez et al. advocated for early exposure to the specialty in medical school and collaborative advancement and mentorship activities for trainees and faculty. [21] In ophthalmology, several national research and career mentorship programs spanning from high school to junior faculty have been launched to increase diversity in the field. [22]

4.2 Strategies for recruiting more Hispanic faculty

A diverse faculty cohort is essential to recruiting and mentoring underrepresented minority (URM) students and residents. The data reported here demonstrate that recruiting Hispanic faculty to join medical schools has been a long-standing challenge. Strategies by de Jesus Perez et al. aimed at recruiting more Hispanic faculty members include addressing bias and discrimination in the workplace, increasing mentorship, and reducing the financial burden, among others.[23]

Table 1 shows examples of national, institution-level, and department-level strategies to increase Hispanic faculty. One national strategy is the founding of the Hispanic Association of Colleges and Universities (HACU) in 1986. This resulted in the federal recognition of institutions with high Hispanic enrollment as Hispanic Serving Institutions (HSIs). Twenty-four of these institutions have medical schools.[24] Also, in 1994, the National Hispanic Medical Association was launched to empower Hispanic physicians.[25] Initiatives explicitly focused on increasing the number of Hispanic medical students began when medical students created regional organizations, which laid the foundation for the Latino Medical Student Association (LMSA), launched in 2009.[26]

National strategies aimed at increasing racial and ethnic diversity among medical students date back to the 1970s when the AAMC officially recommended increasing enrollment of URM students and created a task force charged with this goal.[4,27] Despite this effort, the under-representation of minority medical students worsened between the mid-1970s and 1980s.[28] In 1990, HW Nickens led a renewed effort by the AAMC entitled Project 3000 by 2000, an initiative with the explicit goal of enrolling 3000 URM medical students per year by the year 2000; this resulted in a 27% increase in URM students over three years.[29] Twenty years later, in 2009, the LCME implemented a medical school accreditation standard focused on policies that attract URM students, faculty, and staff. Ten years after implementing the LCME standard, enrollment of Hispanic medical students increased from 6% to 9%.[30] The Accreditation Council for Graduate Medical Education (ACGME) followed suit with a similar initiative in 2020 when workforce diversity was added to the Common Program Requirements.[31] These efforts focused on trainees could ultimately increase Hispanic medical school faculty.

Disheartening trends of a continuous low representation of Hispanics among medical school faculty are reported here and by others.[9,32] These findings support the urgency of national policies to increase Hispanic enrollment in higher education. Historically, one strategy to achieve this goal has been emphasizing minority student enrollment through affirmative action.[33] Research has shown that when bans on Affirmative Action were instituted, enrollment of URM medical students decreased from 14.8% to 10.8% within five years.[34] It remains to be seen what impact the 2023 U.S. Supreme Court ruling ending affirmative action initiatives will have on Hispanic medical student enrollment and, ultimately, Hispanic representation among medical school faculty.

A second crucial national policy that impacts Hispanics in medicine is the Deferred Action for Childhood Arrivals (DACA) program, which protects eligible individuals from deportation and grants them work permits.[35] After the implementation of DACA, the AAMC reported an 8-fold increase in the number of medical students indicating DACA status.[36] By some estimates, DACA has the potential to contribute up to 31,860 new, predominantly Hispanic, physicians in the coming decades.[37] Other strategies that could efficiently increase the number of Hispanic medical school faculty include increasing the number of residency slots and recruiting Hispanic international medical graduates to these positions.[38]

Retention and promotion of Hispanic faculty members

Retention is critical for sustaining and ultimately increasing the number of Hispanic faculty. In this analysis, we were unable to determine the attrition of faculty. Others have reported a higher attrition rate from academic medicine for URM physicians due to financial debt, lack of engagement, and other career intentions.[39] Academic promotion is essential for faculty retention. The probability of promotion is lower for URM faculty.[39] Supporting this, our findings show that male and especially female Hispanic faculty were likelier to be at the Assistant Professor rank. While this may be due to Hispanic faculty being recruited more recently, it is discouraging that in 2022, only 1.5% and 3.1% of all Full Professors were Hispanic females and males, respectively. These results demonstrate the importance of intentional and longitudinal mentorship and sponsorship for Hispanic faculty. Based on a national survey of medicine departments in U.S. medical schools, Vela et al. outlined critical strategies for retaining and promoting URM medical faculty, including an explicit commitment to workforce diversity from leadership and establishing infrastructure and mentorship to advance URMs to senior leadership positions.[40]

Limitations of the study

A limitation of this study is the terminology used to define this ethnic group. Hispanic is a term that the U.S. Census defined as Americans who trace their origin to Spanish-speaking countries.[39] Although commonly used in research, this term is sometimes confusing and problematic for individuals to whom it applies and can lead to inaccuracies in reporting.[31] For example, by the fourth generation, half of Americans with Hispanic ancestry do not identify as Hispanic.[40] A second limitation of the study is that it included only full-time Hispanic faculty. Therefore, the results do not provide insight into Hispanic physicians who work part-time or volunteer faculty or those who changed careers or moved to nonacademic settings.

Table 1 National and Institutional Strategies to Increase Hispanic Faculty at U.S. Medical Schools

National Strategies	Institution and Department Strategies
Increase medical school enrollment at Hispanic Serving Institutions.	Establish early formalized mentorship programs for Hispanic clinical trainees focused on transitioning to academic medicine after training.
Reinstate Affirmative Action legislation.	Deploy targeted initiatives in subspecialties with low numbers of Hispanics.
Continue and expand DACA and establish routes for permanent legal citizenship.	Protect the ability of DACA and undocumented students and residents to study and practice medicine in the U.S.
Continue and expand LCME and ACGME accreditation standards.	Decrease financial burden through loan repayment and other measures.
Launch a new national goal of recruiting 4,000 Hispanic medical school faculty by 2040.	Launch programs focused on early mentorship of Hispanic undergraduate students toward medical school.
Increase the number of residency slots and fill the slots with Hispanic international medical school graduates.	Institute holistic review for medical school admissions that considers various factors when evaluating applicants.
Increase the college attendance rate and science focus in K-12 education systems in Hispanic communities.	Implement department-level accountability plans for the recruitment and retention of Hispanic faculty.
Increase scholarships, clinical exposure, and research opportunities for community college students.	Establish formal longitudinal mentorship and sponsorship programs to advance Hispanic faculty members to senior leadership and full professor rank.
Expand support for Centers of Excellence, funded by the Health Resources and Services Administration, demonstrating growth in Hispanic faculty.	Provide support for chapters in the Latino Medical Student Association (LMSA) and the Society for the Advancement of Chicano/Hispanics and Native Americans in Science (SACNAS)
Advocate for the continued support of Diversity, Equity, and Inclusion offices in higher education.	Demonstrate allyship and advocacy for those holding diversity, equity, and inclusion leadership roles.

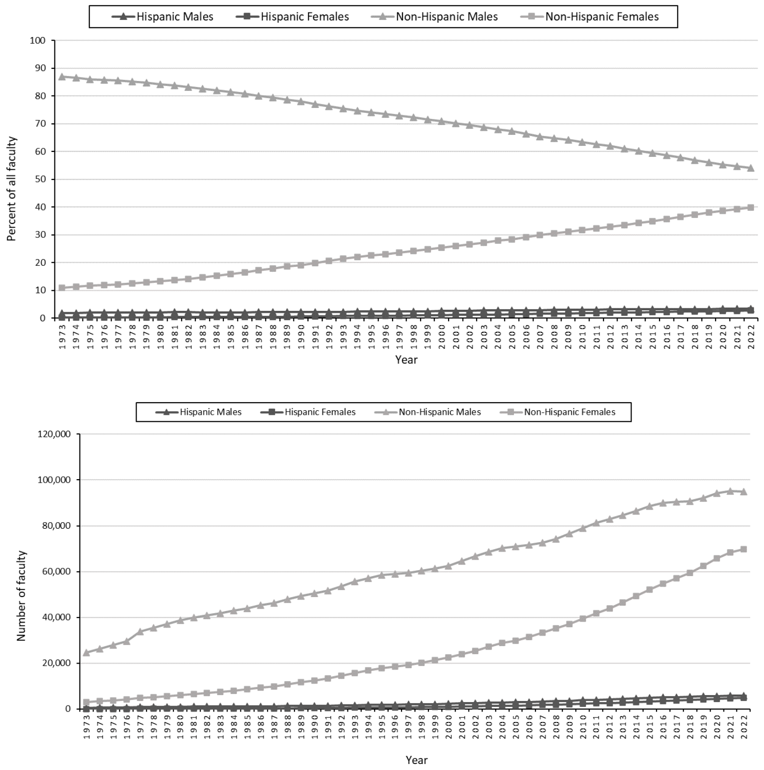
Abbreviations: DACA, Deferred Action for Childhood Arrivals; LCME, Liaison Committee on Medical Education; ACGME, Accreditation Council for Graduate Medical Education.

1. Conclusion

In summary, this study shows that over the last 50 years, there has been only an incremental increase in the representation of Hispanic faculty in basic science and clinical departments of U.S. medical schools. Representation at the senior academic ranks is particularly striking as our results show that of Full Professors in U.S. medical schools, only a tiny percentage are Hispanic. These incremental increases in Hispanic faculty are in the backdrop of a dramatic increase in Hispanics in the U.S. population over the same period. This dynamic has resulted in Hispanics being more under-represented in academic medicine in 2022 than in 1973.

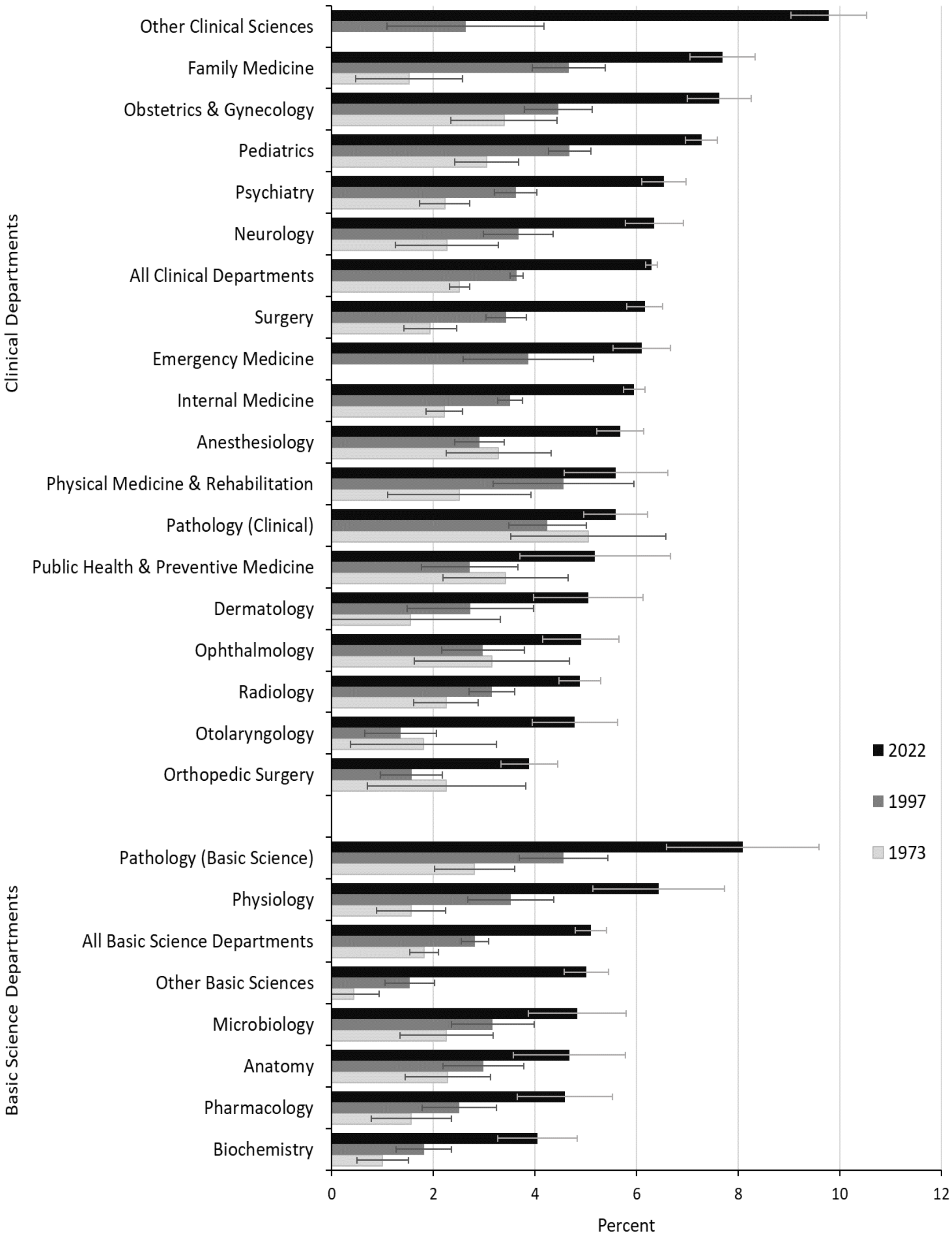
In 1990, HW Nickens et al. concluded that American medicine had yet to reach the goal of population racial parity, so hopefully, set out decades beforehand and that medicine would fall even further behind in achieving this goal without a remarkable increase in the participation of underrepresented minorities in medicine.[26] More than thirty years later, the findings reported here and elsewhere regarding Hispanic medical school faculty demonstrate that a remarkable increase in Hispanic faculty did not occur. At this point, it is no longer sufficient to continue defining the diversity problems in medicine; instead, it is time to implement tangible, bold, and high-impact solutions, including those outlined in **Table 1**. The findings of this study serve as a call to action for members of the academic medical community to understand that the rapidly expanding Hispanic population in the U.S. compels us to redouble our efforts to increase recruitment, retention, and promotion of Hispanic faculty members.

Figure 1 (a & b)



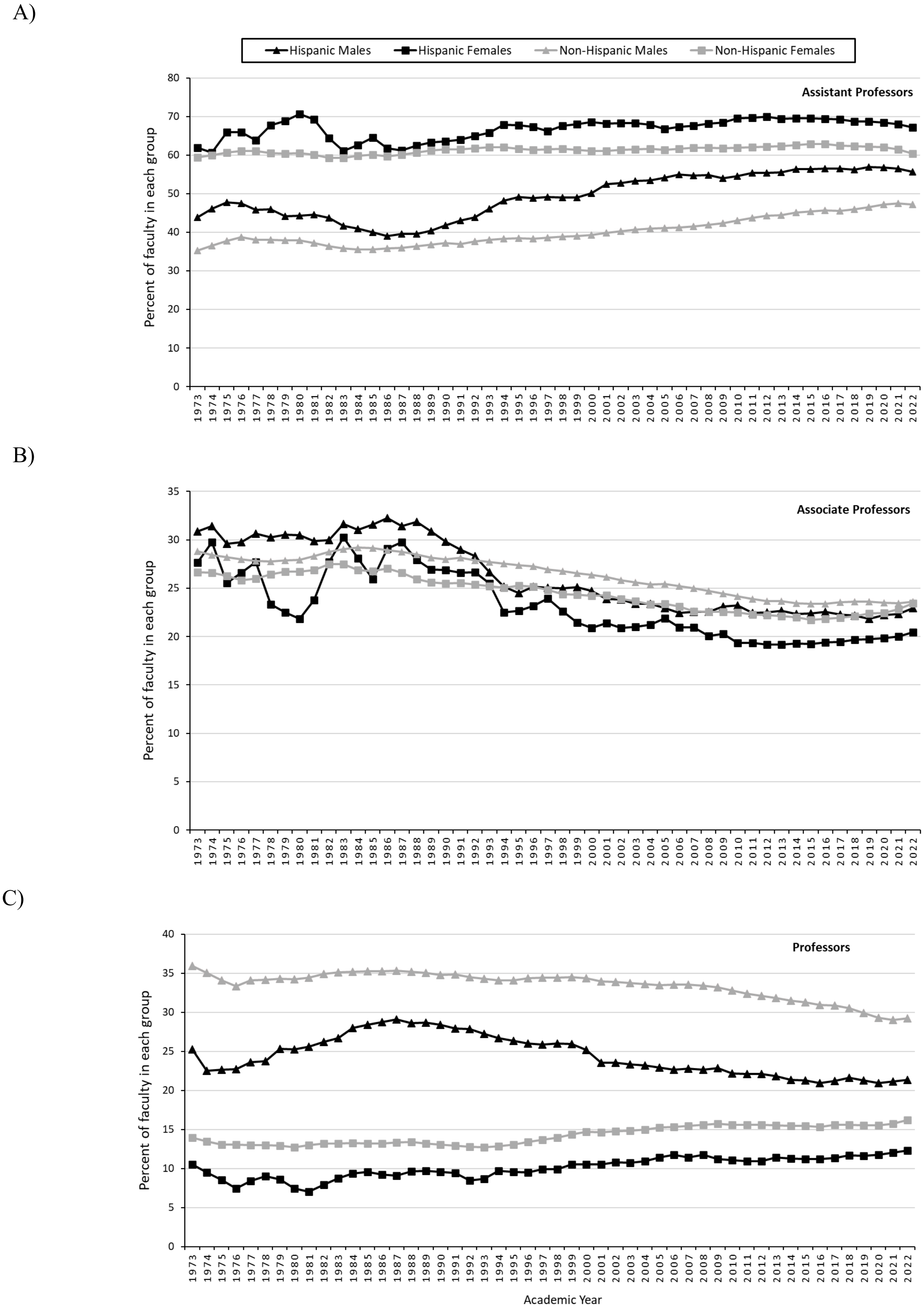
Numbers of all full-time Hispanic and non-Hispanic male and female faculty in all U.S. medical schools, 1973 – 2022. All trendline *P* values were < .001. Data from the Association of American Medical Colleges Faculty Roster.

Figure 2



Department-specific comparisons between the percentages of all full-time Hispanic faculty in 1973, 1997, and 2022. Error bars represent 95% confidence intervals for means. Overlapping error bars represent insignificant differences between percentages—data from the Association of American Medical Colleges Faculty Roster.

Figure 3


A)
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Assistant Professors
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Associate Professors
Percent of faculty in each group
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C)
Professors
Percent of faculty in each group
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2022
Academic Year

Academic rank (Assistant Professor, Associate Professor, and Full Professor) among Hispanic and non-Hispanic faculty in U.S. medical schools, 1973-2022. All trendline P values were < .001. Data from the Association of American Medical Colleges Faculty Roster. Colleges Faculty Roster.

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Can AI Hear Me? Nine Facts About the Artificial Intelligence Scribe

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ABSTRACT

This article summarizes important features of artificial intelligence scribe (AIS) and its application as a digital scribe through the utilization of voice recognition as it is integrated into the clinical practice of medicine. This discussion will include 1) digital scribe technology, 2) practical utility, 3) liability, 4) privacy, 5) integration to electronic health records (EHR), 6) technology burden, 7) case use, 8) AIS documentation styles, and 9) cost. The use of AIS technology in healthcare is a promising tool and will result in variability applications requiring healthcare providers to be aware of the complexities of the tool before utilization, during implementation, the effect of it on workflow, and its acceptance by the patients we serve. AIS technology promises to decrease the cognitive workload of the healthcare provider, through application by relieving the ever-increasing burden of documenting the medical record, organizing, and capturing relevant medical data, by improving integration of this data into cumbersome EHRs, thus providing better work life balance. The authors piloted a version of an AIS in a primarily Spanish patient population. This article provides a unique perspective towards the usability of an AIS in a Hispanic patient population.

Keywords: *digital scribe, artificial intelligence, virtual scribe, speech recognition, voice recognition, e-scribe, EHR integration*

1. Introduction

As the documentation burden has increased so has the demand and pressure for healthcare providers to provide evidence of the care being provided. The need to document the level of care, the quality measures being applied, patient education, orders for ancillary services, referrals, and the integration of multiple sources of medical information all being used in decision making model for payment has made it imperative that healthcare providers seek alternative ways to capture and document the care they provide. These dynamics place healthcare providers into a documentation paradox; to document a medical encounter comprehensively and ethically, bill correctly, avoid potential liabilities, all in an efficient and timely manner that allows the provider to interact and bond with the patient.

There have been several solutions initiated to address this issue, for example the use of transcription, while it made the charts more comprehensive and easier to read, it did little to reduce the burdens described. More recently was the integration and use of human scribes as a methodology initiated to address this demand, and while the overall application of this methodology has found that use of human scribes can be effective, that many providers like the premise and the intended relief offered due to more face time with the patient, less time spent documenting; however, the application and wide utilization are limited because of cost and potential return on investment (ROI).[1,2]

This article will focus on the use of the AIS. This virtual scribe is a scribe that utilizes speech/voice recognition technology to "listen" to in-clinic conversations utilizing artificial intelligence to organize the conversation into data format that is useful medical data: (history of present illness, review of systems, physical exams, treatment plan, and diagnosis). Gellert wrote that evolving artificial intelligence will help make the practice of medicine more satisfying and can potentially eliminate the EHR as a contributor to burnout.[3] A national poll revealed that AI-assisted documentation may be beneficial in that it frees clinicians from less cognitively useful tasks.[4] Ghatnekar, Faletsky, and Nambudiri cited barriers to this technology including upfront costs, time-intensive training, linguistic variations, medical-legal compliance, and interoperability with existing computer systems.[5]

The authors of this article piloted an AIS in two clinics in Texas with approximately 120 + patients a week and with Telemedicine visits. The authors work in primary care and deliver patient care to family practice patients and have an opportunity to utilize an AIS during busy days with acute and chronic cases. Since the population was largely Hispanic (and the authors are two native Spanish speakers) the entire article stems from the authors' experience with a pilot of an AIS in a Hispanic population. Therefore, the article provides a unique perspective regarding the clinical utility of the AIS when working with Hispanic patients.

1.1 Technology

Speech recognition (SR) and Voice Recognition (VR) as an input mechanism that translates speech into text.[6] AISs are intelligent documentation assistants that utilize SR and VR, natural language processing, machine learning (ML), and large language models (LLM) to document clinical encounters. Tran et al share that Ambient clinical documentation technology uses automatic speech recognition (ASR) a combination of SR/VR and natural language processing (NLP) to transform patient–clinician conversations into clinical documentation.[7] NLP is a technology that allows computer software to understand human language. Powered by ambient technology the digital scribe can provide a documentation recommendation after 'listening" to a clinical encounter with a patient. A digital scribe has been defined by Falcetta et al as an automated clinical documentation system that capture the physician–patient conversation and then generate the documentation for the appointment, enabling the clinician to engage with the patient entirely.[8] The speech and voice recognition program can differentiate and understand who is speaking (provider patient/caregiver) and has the capacity to understand multiple languages including Spanish, translating the entire clinic visit into an English format for EHR records. Additionally, the use of the AIS is efficient in translating Spanish. Artificial intelligence driven digital scribes have the ability to listen, "understand," and translate a visit conducted in Spanish into English. Furthermore, in a situation where a human translator is involved, the clinician has AIS functions as a tool to check the veracity and or accuracy of the human translator. AIS may improve the quality of translation in addition to scribing and medical note creation. This is an important aspect of the technology that is useful for the Hispanic population.

1.2 Practical Utility

The AIS concept is presenting itself at a time when documentation requirements are increasing, EHR learning curves are becoming more complex, and change is part of the clinician job description. According to the American Academy of Family Practice, there are different methodologies to assist clinicians in completing documentation: dictation systems, transcription services, ambient systems, virtual human scribes, live human scribes, and artificial intelligence assistance. [9] The task of AIS is to essentially reduce the clinicians' burden of documentation while meeting the complexities and needs of healthcare providers in the medical industry. This basic process could be easily accomplished by non-medical systems such as a dictation service or a transcription service. However, the potential benefit of artificial intelligence scribing is that it can organize the accrued data into medical notes. This digital scribe aims to meet the challenge of emerging divergence of many patient complaints and assist the healthcare provider in completing the documentation requirements while reducing the burden.

The AIS intends to both reduce the documentation burden of the clinician and facilitate efficiency in completing the notes. Another benefit of the AIS is its availability for clinician use, it does not require paid time off and is available whenever the clinician is providing care (evenings, weekends, and holidays) and may provide as significant ROI. Last, the digital scribe may function as a memory aid, Wang et al highlight that "using the digital scribe to document information during patient encounters, providers may more easily recall encounter events when editing multiple notes."[8,10]

1.3 Clinician liability

EHRs are riddled with opportunities for errors. A clerical error may be a precursor to a wrong diagnosis and consequent plan including erroneous medications._Template utilization allows for preselected answers that clinicians may need to take the time to correct. A similar situation may occur for the AIS_if there is an error in the format process resulting in something erroneously being heard, recognized, or translated. Similarly, errors may occur when the AIS does not distinguish who is the speaker in the recording (clinician, family member, or patient). The errors that may occur due to the AIS, speech recognition and or voice recognition can be a precursor to clinician liability.

Further,_Azamfirei, et al highlighted that LLMs are prone to hallucinations, where the AIS generates data based on data sets and probabilities and cannot verify when it is wrong.[11] Therefore, in programs like Chat GPT, the AI may" hallucinate" or compose erroneous data. The authors wrote that the LLMs may not have "an output to verify correctness."[11] Also, Azamfirei, et al emphasize that it is important to recognize the limitations of all medical tools including the limitations of the AIS.[11]

In 2023, Tang et. al conducted a systematic study of large language models (LLM) the potential and possible limitations of zero-shot prompt-based LLMs on medical evidence summarization using GPT-3.5 and ChatGPT models.[12] The authors explored the summarization of medical evidence findings in the context of evidence synthesis and meta-analysis evaluated systems such as Chat GPT for errors in language models by completing a large review of medical summaries and sub-divided the errors into the following categories:

- **Factual consistency** - measures whether the statements in the summary (made by the AI) were supported by the systematic review.
- **Medical Harmfulness or Risk** - refers to the potential of a summary that leads to physical or psychological harm or unwanted changes in therapy or compliance due to the misinterpretation of information.
- **Comprehensiveness** - evaluates whether a summary contains sufficient information to cover the objectives of the systematic review.
- **Coherence** - refers to the ability of a summary to build a coherent body of information about a topic through sentence-to sentence connections.[12]

Other authors have evaluated error margins of AI-driven systems. In 2015, Hodgson and Coiera completed a study comparing speech recognition (SR) to dictated transcription (DT) evaluating document turnaround time (TAT) and error rates.[6] SR consistently improved TAT compared to DT at a greater level (16.41% to 82.34%), across all studies the improvement was 0.90% per year.[4] SR accuracy was reported in ten studies (88.90% to 96.00%) and appears to improve by 0.03% per year as the technology matured, meaning the longer it was used the greater the efficacy.[1] However, the mean number of errors per report increased using SR (0.05 to 6.66) compared to DT (0.02 to 0.40).[6]

Non-AI driven transcription services may have errors as well. Zhou et. al completed a cross-sectional study evaluating how accurately clinical documents are dictated by speech recognition software (Dragon Medical 360) edited and reviewed by both medical transcriptionists and physicians.[13] Their findings demonstrated an overall error rate greater than 7% (7 errors per 100 words) and supported the importance of review and editing.[13] In addition, the healthcare provider should be cautious concerning automatization bias, where the information produced by a machine is not verified and it is trusted as truth.[13,14] Given the above, the clinician should always verify the accuracy of the recommendation by the digital scribe. An example is that the healthcare provider may say they are going to the Y (referring to a gym), and the AIS may type that the patient is going to Hawaii. Healthcare providers must be prudent to verify the accuracy of output of the digital scribe to be most successful. Although this type of mistake may not occur frequently the astute clinician must be aware of the possibility of this type of error. As the AIS continues to evolve the premise is that errors of transcription are possible depending on the speaker's accent or dialect, however it is anticipated that the overall the error rates will remain low and will continue decline over time with improvement technologies and application. It is possible that AI and the AIS will continue to be adopted over time.[15]

1.4 Privacy

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) a federal law required the creation of national standards to protect sensitive patient health information from being disclosed without the patient's consent or knowledge. Before this period, medical records were the purview of the clinician and patient and relied on paper files to be maintained and secured by the provider. The digitization of information; word processing, faxing, EHRs, and the evolution of the World Wide Web made it necessary to create a standardized method for protecting personal information. The advent of third-party AI adds complexity to the nature and essence of the documentation of the medical visit raising concerns that include access, use, and control of patient data in private hands. These public–private partnerships for implementing AI have resulted in poor privacy protection.[16]Another concern relates to the external risk of privacy breaches through AI-driven methods, even with the ability to de-identify or anonymize patient health data it may be compromised or even nullified with new algorithms that have successfully reidentified such data which increases the risk to patient data under private custodianship.[17]

Other related concerns of privacy are the issues of a digital presence in the healthcare setting because of previous medical atrocities such as the Guatemalan Syphilis Study in 1946 by the U.S. Government that resulted in a higher level of distrust in the Latino community of the medical community than Caucasians counterparts.[18,19] Hispanics may perceive a breach of confidentiality, that somebody is listening and will use the information against them for other reasons than providing care. This is particular the concern is for patients that may be undocumented and may cause Hispanics to avoid seeking medical care. This will require organizations such as National Hispanic Medical Association (NHMA), American Medical Association (AMA), National Medical Association (NMA) and other professional groups to educate providers and the lay community about the evolution of the AIS, and its' utilization and integration into the clinical setting.

1.5 Integration to EHRs

Developing the AI systems underpinning digital scribes will require access to clinical datasets for machine learning. SR works well for note dictation, however, it is less effective when used with modern EHRs, introducing errors with the potential for patient harm. The question regarding integration directly correlates with the usability

of the tool. If the integration feature is not seamless then the clinician will spend more time migrating the AI data, increasing interactions with technology, and decreasing time spent with patients. Therefore, the integration workflow is an important consideration when considering different versions of digital scribes.

Appropriate integration of SR/VR will be a must and the need for standards will need to be established. Also, clinicians may consider "optimizing ambient AI scribe output for accuracy, relevance, and alignment in the physician–patient relationship."[20]

1.6 Technology requirements

The efficient use of the AIS requires a laptop, or applicable mobile device/tablet. This device must be durable (transported from room to room), highly mobile (small and lightweight), cost-effective, Wi-Fi and software compatible, HIPPA compliant and have long-life batteries. A high bandwidth quality internet connection is essential to efficient workflows without affecting productivity. Lieberman et al suggest that there is a need to "improve digital tools to facilitate family history collection."[21.]

There are implications with technology, cost, and computer resources in poor or rural communities. Specifically, there may be a large digital divide for access to high quality internet infrastructures (computers/laptops/electronic pads) for the Latino community. Clinicians that provide care to these populations have increased limited financial resources and challenges to provide a high level of computer generated EHR or AI supported software. Cost is a significant barrier as costs to EHRs may be limiting, for example the cost of an Epic System or similar may prevent the Latino community from access to helpful technology as the digital scribe.

1.7 Case use

There are variable applications of case use for the AIS including utilizing it as a dictation device. This speech recognition system transcribes information and functions as an artificial assistant. Utilized as an artificial assistant, the AIS may be able to complete many of the tasks the provider typically completes directly. However, the technology burden may push the clinician to choose to utilize the digital scribe in only selected instances. Further, the clinician may utilize some instances as a dictation device (speak to the AI after the patient encounter) or have the AIS listen to the entire clinical encounter to create a medical note. For example, the clinician may choose to utilize all the features of the digital scribe with a new patient or a wellness exam and may choose not to utilize the software for straightforward cases acute cases (acute nasopharyngitis). Therefore, the clinician has flexibility with regards to how and when to utilize the AIS.

1.8 Documentation styles with AI Scribing

Some versions of the allow for different formatting of notes-narrative, bulleted, or a combination. Prior notes may have been short to increase efficiency or relied heavily on templates. The new AIS notes may be too detailed, capture irrelevant facts, or document too many complaints or errors, which may affect the care being delivered. Over-documenting may in fact- increase the risk and responsibility of the clinician. Essentially, this may increase the clinicians' stress level and inadvertently increase the number of demands necessary in documenting and caring for the patient. Therefore, the clinician may choose to utilize all or only a portion of the AIS potential recommendation for documentation. Or the clinician may choose to utilize different styles of notes depending on if the AI brand/type and type of patient visit (acute/chronic).

1.9 Cost

The upfront costs associated with implementing an AIS platform in healthcare can vary widely based on the complexity and scope of the AI project. Stokes discussed several upfront costs however also discussed potential cost savings and long-term return on investment (ROI) and revenue enhancements:[15]

- **Technology Acquisition:** This includes the purchase or development of AI software and hardware infrastructure, including specialized AI algorithms, computing resources, and data storage systems.
- **Data Preparation:** Preparing and cleaning healthcare data for AI analysis can be labor-intensive. Data preparation costs may include data extraction, cleansing, and transformation.
- **Staff Training:** Healthcare professionals and IT staff may require training to effectively use AI systems. Training costs include workshops, courses, and time away from regular duties.
- **Integration**: Integrating AI systems with existing healthcare IT infrastructure, such as Electronic Health Records (EHR) systems, may require significant resources and expertise.
- **Regulatory Compliance:** Ensuring that the AI implementation complies with healthcare regulations, such as HIPAA, may entail additional costs for legal and regulatory consulting.
- **Pilot Programs:** Running pilot programs to test the AI system in a real healthcare setting may involve costs related to trial implementation and monitoring.[15]

Despite the initial cost investment, the AIS may produce savings by increasing efficiency, improving the billing process, and decreasing the costs of human scribes which can be a significant expense at $50K per application annually.[5] Ghatnekar, Faletsky, and Nambudiri discuss the high cost of in person live scribes.[5] Administrators must carefully consider the cost of the AIS vs the costs of a human scribes in the overall evaluation on the ROI. The reduction in cost of implementing an AIS savings versus cost of human scribe can include time intensive training, high turnover rates,-and other HR issues such as missing work, benefits, overtime, and paid time off.[5]-

There are some negative consequences of the AIS that include loss of function that current AIS platforms cannot perform and that human scribes can fulfill writing prescriptions, making referrals, and completing complex coding requirements that easily flow from gathered data in its current capacity. Additionally, human scribes may be able to assess the patient/provider interaction and determine authenticity and body language that affects the consultation that cannot be seen or captured by a digital platform. Over time these specific limitations may be negated with improvements in technology.

2. Discussion

Incorporating the AIS and digital scribing with SR/VR into healthcare can be transformative, however, it requires careful planning and consideration. A robust AIS decision framework serves as a guide to help healthcare stakeholders navigate the complex terrain of the AIS implementation. Considerations include addressing data quality, ethics, clinical validity, integration, cost-benefit, and training. Healthcare providers must make informed decisions about AIS's suitability for their healthcare infrastructure. The digital transformation of healthcare is inevitable. Since the AIS allows for more robust notes, utilization of this technology may (in time) become the standard. Therefore, the clinician of today may consider early adoption as a proactive approach to the possible pending avalanche of AIS ubiquity in healthcare.-Integrating the AIS into practice promises to decrease the clinician's burden of documenting the EHR record and will allow the clinician to focus more time on building patient-clinician rapport during patient encounters.

According to the author's experience with the AIS, the AIS is useful in providing care for Hispanic patients. A positive factor includes allowing the AIS to formulate a comprehensive medical report. The primary care clinician of today is tasked with increasing administrative burdens which is increasing the imbalance of work life balance. Although, the

AIS does not eradicate this burden it may reduce workflow pressures. Hispanic patients have higher burden of comorbidities such as diabetes mellitus, chronic kidney disease, hypertension, and obesity the care of this population requires significant time. Although there is a benefit to the AIS in the Latino population, cost is a barrier and may prohibit access to an AIS in underserved settings. Despite these barriers, the need for the AIS is imperative for future growth and application due to its inherent properties of increasing face to face time with the clinician that will allow more time to provide medical education to the Latino population.

Clinician liability may be decreased by clarifying to the AI who is in the room. In order to assist the AIS in distinguishing the speaker during clinical encounters through speech/voice recognition the clinician may consider introducing the participants of the encounter to the AIS in the following manner, “I am Dr. Ramirez, I will be caring for you today, and you are Mrs. Garcia the mom, and you Maria are the patient.” Then, the clinician may conduct the interview.

The AIS may not necessarily improve productivity; however, studies demonstrate that there is a significant increase in quality of notes, and clinical care.[20] AIS may improve clinician satisfaction, reduce in administrative burden, and improve patient satisfaction.[20] Additional outcomes may improve value-based care and quality metrics. Future development and ongoing development of the AIS should include standardized methodology for application of the AIS modality. This may include creating a standardized level of accuracy, including a certain panel of languages, and uniform language model training. Further development of the AIS could include a robust artificial intelligence platform to create a more comprehensive standard AIS and standard medical artificial intelligence.

3. Conclusion

In conclusion, the AIS is an effective tool although it is in early development it is promising for widespread applications and clinical utilization. In our pilot project, we discovered that the AIS has comprehensive speech and voice recognition abilities that can be useful for transcription, translation, and documentation purposes when treating the Latino population with limited English-speaking abilities. In order to make AIS accessible for clinicians treating Latino and other underserved populations the AIS will require cost effective applications that provide quality and accessible care. Further studies AIS and the use of AI in clinical applications are necessary to meet the needs of the growing Latino population.

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Unsettled: Migrant Health in the US (Podcast Series)

Judith Flores, MD, FAAP, CHCQM; **Roberto Johansson** MD**,** PhD, FAAP; **Lila Cherkasskly,** MD**;**
Benard P. Dreyer MD, PhD, FAAP

This podcast provides a forum where those involved in caring for and providing services to newly displaced persons can share their experiences, learn from each other, and avoid feeling isolated in this important work. The goal is to create a space for shared experiences and lessons learned on migrant health in the U.S.

Objectives

1. To build community through continued meetings and to develop new contacts and ideas for content and education.
2. To develop written summaries of each episode to be used as educational tools, helping to expand the knowledge base in medical health and education for the community at large.
3. To develop partnerships in fields such as economics, criminal justice, and others by identifying individuals who are working on issues that impact the health and well-being of newly displaced persons in the U.S.

New Episodes:

Lessons in Advocacy:

In this episode, we had the privilege of speaking with Dr. Benard Dreyer, a tireless advocate for children affected by inequity, poverty, and migration. Dr. Dreyer, an academic pediatric leader, past president of the American Academy of Pediatrics, and 2024 recipient of the Joseph W. St. Geme Jr. Lifetime Achievement Award, has significantly influenced health equity, child poverty, diversity, child development, and pediatric research. Leading the conversation is Dr. Bert Johanson, a pediatrician and researcher working on the U.S. southern border, who highlights Dr. Dreyer's impact in pushing for safer, more equitable policies for unaccompanied minors at the border.

Migrants in Nebraska:

Today's episode of Unsettled shifts focus from sanctuary cities like New York and Chicago to Nebraska, one of the latest U.S. destinations welcoming new migrants. We're joined by Dr. Cherkasskiy, a family practitioner who came to the U.S. from Ukraine as a child and now provides care to some of Nebraska's newest arrivals while training future physicians. Dr. Cherkasskiy holds a PhD in Social Psychology from Yale, a medical degree from UC San Diego, and completed her residency in Family Medicine at Creighton University, where she is now an Assistant Professor and Associate Program Director. She shares her unique perspective on how her immigrant journey compares with the experiences of Omaha's migrant community.

**Refer to JNHMA Volume 2, Issue 1, April 2024 for introductory episodes in this series*

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The Journal of the National Hispanic Medical Association (JNHMA) provides a forum for researchers, physicians and other healthcare professionals to share the unique and important issues that affect the Hispanic/Latino communities. The Journal's mission is to serve as an educational hub for topics regarding public health, health equity, and the health of Hispanics and other underserved communities in the United States and abroad.

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The National Hispanic Medical Association works to improve the health and well-being of the Hispanic populations locally, regionally, and nationally through mentorship, educational resources, improving healthcare access, and advocacy. In accordance with NHMA's overall mission, this journal provides a forum for idea sharing, research findings, and advocacy tools for everyone interested in advancing health equity through public advocacy, academic research, and education.

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