

Examining the Relationship between Telehealth Utilization and Emergency

Department Utilization across Groups

by

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## Abstract

Telehealth has the potential to transform the delivery of healthcare by broadening access to preventive and non-emergency service. Although there has been some achievement with telehealth, there are still ongoing issues around telehealth in emergency departments and delays of healthcare with specific racial and ethnic populations (Chen et al., 2016; Healthy People, 2020; Heppner et al., 2021). The purpose of this study was to examine the relationship between telehealth and ED utilization across groups. This study employed a cross-sectional design utilizing data from the 2019 California Health Interview Survey (CHIS). A Chi-square test was used to evaluate the relationship between utilization of telehealth services and ED visits. Also examined was the relationship between self-reported delays in care and ED visits. A paired-samples t-test was used to evaluate the differences between the number of emergency departments visits between telehealth services utilized. A one-way analysis of variance (ANOVA) test was used to assess differences in emergency department utilization across races/ethnicities. A Kruskal Wallis test was used to evaluate differences in self-reported delays in care across race/ethnicity categories. There was a significant difference in self-reported delays in care and emergency department visits ( $p < .05$ ), emergency department utilization across ethnicity categories ( $p < .05$ ), and in self-reported delays in care across race/ethnicity categories ( $p < .05$ ). No significant difference was found in the number of emergency departments visits between those who did and did not self-report utilizing telehealth services ( $p > .05$ ). Self-reported delays in care and the number of self-reported emergency department visits were significantly different ( $p < .01$ ).

*Keywords: telehealth, delays in healthcare, ethnicity, emergency department*

*visits*

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## **Introduction**

### **Overview of the Literature**

Telehealth is a revolutionized way to receive adequate healthcare services remotely (Koonin et al., 2020). The term is used interchangeably with telemedicine (Tuckson et al., 2018). Telehealth is defined as the use of medical information and the delivery of healthcare services that are exchanged from one site to another through electronic communication (Tuckson et al., 2018). Telehealth helps in the diagnosis of treatment, prevention of disease and injuries, research and evaluation, and education of healthcare providers to improve a patient's health (Tuckson et al., 2018). The use of telehealth has steadily increased through the years, and the remote administration of health services has become a viable modality for administering patient care in many circumstances (Kruse et al., 2017). According to the Department of Health and Human Services (HHS, 2016), 40% to 50% of all hospitals and more than 60% of all health care institutions in the United States used some form of telehealth in 2015. In 2020, the Centers for Disease Control and Prevention (CDC) stated that telehealth visits increased by 154%. Over the last several years, telehealth services were proven to be successful in filling certain gaps in care, including providing access to services after regular clinical hours, circumventing provider shortages, reducing family and patient travel burdens, and facilitating services such as refilling prescriptions and appointment scheduling (Tuckson et al., 2018). Although there has been some success with telehealth, there are still ongoing issues revolving around trends in telehealth use in emergency departments, along with delays of care among specific racial and ethnic populations (Chen et al., 2016; Healthy People, 2020; Heppner et al., 2021).

## **Emergency Departments**

Since the early 1990s, the number of emergency department (ED) visits has continued to rise nationally (Gindi et al., 2016; Tang et al., 2010). Across the United States (U.S.), most EDs reported experiencing difficulty at some point in providing effective and timely emergency medical care (Taylor, 2006). Patients who cannot obtain timely access to primary care often present to the ED, frequently with high acuity complications and illnesses (Tang et al., 2010). It has also been reported that many ED visits were "resource-sensitive" and could be potentially preventable (Weiss et al., 2014, p. 1). In other words, access to community-based healthcare can prevent the need for ED visits. High ED visit utilization reflects significant health needs of the community, especially in locations where the ED may provide the only readily available health care source for individuals (Weiss et al., 2014). Research also stated racial and ethnic differences are apparent in ED visits (Goyal et al., 2015) and individuals of different race and ethnicity categories have different levels of access. (Rodriquez, 2021).

## **Delays in Care**

Delayed care, also called delay of treatment, is when a patient does not receive timely treatment for physical, mental, or emotional health concerns (The Joint Commission, 2015). Whether it be physical therapy sessions, lab tests, medications, or any other treatment that has been ordered for the patient in a prescribed timeframe (The Joint Commission, 2015). Limited access to health insurance and other cost-associated barriers are driving forces preventing healthcare access for many individuals and populations in the United States (Tolbert et al., 2020; Sommers et al.,

2017). These impediments can delay medical care and increase the mortality and morbidity risks associated with preventable and treatable medical conditions (Marynak et al., 2020). Although healthcare delays have affected many demographics of U.S. patients, research showed that there are disparities in care among racial and ethnic groups (Benjamins & Whitman, 2014). Benjamins and Whitman (2014) also asserted that wait times for hospital visits vary according to race or ethnicity. Racial minorities are 10% less likely to receive emergent or immediate care and be admitted to the hospital following their ED visit (Zhang et al., 2020).

### **Racial Disparities**

Throughout the years, racial disparities in emergency department visits and wait times to see a physician have been demonstrated (Goyal et al., 2015). Black and LatinX/Hispanic individuals face critical differences in healthcare access due to reduced choice of where they can receive care, higher rates of uninsurance, and various cultural and linguistic barriers compared to White individuals (Zhang et al., 2020). Additionally, Hispanic and Black individuals are more likely to seek care in hospital emergency departments because they are less likely than whites to have a primary care provider for preventive and routine health needs (Zhang et al., 2020).

Racial disparities have been recognized in primary care utilization at community health centers and private healthcare offices. Racial minorities have historically used the ED at higher rates than their white counterparts (Arnett et al., 2016). Unfortunately, residential segregation has been identified as a mediator of the race-health relationship, exposing racial minorities and white Americans to social and environmental factors of neighborhood characteristics that influence health behavior

and outcomes (White et al. 2012). These factors include the proximity of healthcare professionals and their facilities as well as the type of insurance that is provided and accepted by each community's healthcare providers (Gaskin et al., 2012)

Historically, there have been significant differences in health insurance coverage among different races and ethnicities in the United States. The African American and Hispanic populations have persistently had lower insurance coverage rates at all ages (Sohn, 2017). They have more significant insurance loss and slower insurance gain than their white counterparts (Sohn, 2017). According to an article from Kaiser Family Foundation (KFF) by Tolbert and Orgera (2020), 28.9 million non-elderly individuals were uninsured in 2019. The Hispanic population uninsured rate was 20%, and the Black population had an 11.4% uninsured rate, while their white counterparts had an uninsured rate of 7.8% (Tolbert & Orgera, 2020). These results showed that the Hispanic and black population have a higher rate on being uninsured (Tolbert & Orgera, 2020). Having no insurance creates considerable barriers to receiving healthcare services. Having inconsistent patterns of being uninsured and insured at various points of a person's life can negatively impact their overall health status and quality of life (Zhang et al., 2020). Uninsured patients experience more interruptions in their care and have a lower chance of establishing a relationship with their primary care providers (Zhang et al., 2020).

Although general access to healthcare resources and insurance status have been demonstrated to be factors in racial disparities in healthcare, language barriers also interfere with health care experience and receipt of high-quality care. In the United States, there are over 25.6 million people with limited English proficiency

(Rodriguez et al., 2021). Having a limited English ability can significantly affect a patient's number of hospitalizations, length of stay, readmissions, emergency department visits, and access to preventative care (Rawal et al., 2019). Rodriguez et al. (2021) found that patients with limited English proficiency had lower rates of telehealth use (4.8%) compared with proficient English speakers (12.3%).

## **Conclusion**

Telehealth use has slowly increased throughout the years with a sharp increase in the availability and use of these services during the onset of the COVID-19 pandemic in 2020 (CDC, 2020). In 2020, telehealth services increased over 50%, and Centers for Disease Control and prevention determined that this emerging technology could address healthcare disparities (CDC, 2020). Telehealth services are a great tool for aiding preventable health problems and are more helpful for urgent care situations than true medical situations (Tuckson et al., 2018). Although evidence suggested telehealth improves access to care, patient satisfaction, and outcomes to preventable diseases, current literature emphasized that there were still gaps revolving around trends in telehealth use in emergency departments as well as delays of care for specific racial and ethnic populations (Chen et al., 2016; Healthy People, 2020; Heppner et al., 2021). Essentially, the goal of this study is to examine these health care disparities, promote telehealth equity, and improve patients' quality of visits and their needs. While there are always going to be challenges in health care, telehealth has the potential to address some current disparities (Heppner et al., 2021).

## **Purpose of the Study**

The purpose of this study was to examine the differences between telehealth and its trends of use within emergency departments and different racial and ethnic backgrounds. More precisely, the objective was to determine if there was a lower visit rate to EDs among the use of telehealth services and user delays in care in among patients of different races and ethnicities. The outcomes of this study could promote telehealth programs to improve the quality of visits, reduce visits to the emergency department, and enhance knowledge of the different races/ethnicities that use telehealth. This study could also provide awareness to telehealth access inequalities among underserved populations.

## **Research Questions**

The following research questions were answered in this study:

1. Is there a relationship between self-reported outpatient telehealth utilization and self-reported visits to the emergency department in the last year (12 months)?
2. Is there a difference between the number of self-reported Emergency Department visits in the last 12 months for patients who report using telehealth and those who report not using telehealth during that same timeframe?
3. Is there a difference between self-reported utilization of the emergency department (as measured by ED visits in the 12 months) across race/ethnicity categories?

4. Is there a relationship in self-reported delays in care (such as not being able to see a doctor, specialist, or healthcare provider) and emergency department visits in the last 12 months? (People who aren't able to see their PMD, do they go to the ER instead?)
5. Are there statistically significant differences (disparities) in delays in care across race/ethnicity categories?

### **Hypotheses**

H1: There is a relationship between self-reported telehealth visits and ED visits (Y/N in last year)

H2: There is a relationship between number of ED visits and telehealth usage

H3: There is a difference between self-reported utilization of emergency department visits across race ethnicity categories.

H4: There is a relationship in self-reported delays in care and emergency department visits.

H5: There is a statistically significant difference in delays of care across race/ethnicity categories.



## **Method**

### **Design**

A cross-sectional design study was utilized to explore the relationship between telehealth and delays in care disparities, including emergency department visits and among specific racial and ethnic populations. Publicly available secondary data for the year 2019 were obtained from the California Health Interview Survey's (CHIS) public use files. The CHIS provides researchers open access to data regarding a variety of health indicators on an annual basis, free of charge, via public use files and their online webtool, AskCHIS (UCLA Center for Health Policy Research, 2020).

The CHIS is one of the nation's largest state health web and telephone surveys in the United States (UCLA Center for Health Policy Research, 2020). It was developed by the UCLA Center for Health Policy and Research, California Department of Health Care Services, and the California Department of Public Health (UCLA Center for Health Policy Research, 2020). SQL Server Reporting Services (SSRS), an independent research firm specializing in innovative methodologies to reach a highly diverse population size, collaborated with UCLA in the methodology and collected data for CHIS 2019 (UCLA Center for Health Policy Research, 2020). SSRS randomly interviewed one adult, adolescent, and child, if present from each sampled household (UCLA Center for Health Policy Research, 2020). The CHIS survey covers dozens of essential health topics like health insurance coverage, telehealth, and care delays. It also provides an abundant source of data on Californians and other various racial and ethnic groups (UCLA Center for Health Policy Research, 2020).

## **Procedures**

In partnership with SSRS, the CHIS has been conducted bi-annually, and the 2019 CHIS was collected between September 2019 and November 2020 (UCLA Center for Health Policy Research, 2020). In previous years, CHIS was a telephone survey that used a dual-frame random digital (RDD) technique (UCLA Center for Health Policy Research, 2020). To better address and meet objectives, CHIS now uses a mixed-mode (telephone and web) survey that utilizes an address-based sampling (ABS) frame (UCLA Center for Health Policy Research, 2020). The ABS is generated through the United States Postal Service's Computerized Delivery Sequence File (CDS), which includes addresses serviced by the USPS and has near-complete coverage of the household population in the United States (UCLA Center for Health Policy Research, 2020). After randomly selecting the address within the CDS, CHIS mailed out invitation letters to the household inviting one adult member of the home to complete the survey online or with a trained telephone interviewer (UCLA Center for Health Policy Research, 2020).

The survey consisted of questions regarding individuals' overall health condition, health insurance coverage, health-related behaviors, access and utilization to health services health status, and health conditions (UCLA Center for Health Policy Research, 2020). Approximately 80% of the questions from CHIS 2018 continued to CHIS 2019. Other substance use, COVID-19, healthcare/insurance utilizations questions were added to the adults and adolescents survey, and child development questions were added for the children survey (UCLA Center for Health Policy Research, 2020). Geographic stratum were created to divide the 58 counties

in the state to allocate an adequate number of adults in each stratum group.

Computers randomly drew addresses in each of 44 geographic areas representing 41 individual counties and three groupings of the remaining 17 counties with smaller populations together to represent areas in the entire state (UCLA Center for Health Policy Research, 2020).

In collaboration with UCLA Center for Health Policy and Research, SSRS staff randomly contact households each year to participate in the survey. When the SSRS-trained interviewers contact a home, one adult is randomly selected to participate in the survey. Depending on the household's composition, an adolescent (ages 12 to 17) and/or a child (ages 11 and under) may be randomly selected if the sampled adult was their parent or legal guardian. The average interview takes about 40 minutes to complete, and English interviews are shorter than the other languages. To ensure meeting and obtain the complex demographics of people living in California, six different languages were available to use when the interviews were conducted: English, Spanish, Vietnamese, Chinese (Mandarin and Cantonese dialects), Tagalog, and Korean (UCLA Center for Health Policy Research, 2020).

### **Participants**

The 2019 CHIS surveyed a total of 30,072 households, comprising of 22,160 adults who lived in the State of California. The ethnicities represented in the CHIS 2019 collected data cycle were 11.5% Hispanics, 14.7% Korean, 13.2% Vietnamese, and 15.9% other Asian. Out of those 1,000 in the sample size, 17.7% were Hispanic, 66.6% were White, 3.6% were African American, 0.4% were American Indian/Alaskan Native, 9.4% were Asian, and 2.3% were other race.

## **Independent Variable and Dependent Variable**

This study consisted of five questions. The independent variable for the first research question was telehealth visits (Y/N) labeled as variable AJ152V2. This variable was measured by the question, "*During the past 12 months, did you receive care while in a health facility, from a doctor at another location, by use of a video device?*," followed by the options of "Yes," "No," "Refused," and "Don't Know" (CHIS 2019 Data Dictionary, 2020). The dependent variable for the first research question was emergency department visits. This variable labeled AH12V2 was measured by the question, "*During the past 12 months, did you visit a hospital emergency room for your own health?*," followed by the options of "Yes," "No," "Refused", and "Don't Know" (CHIS 2019 Data Dictionary, 2020).

The independent variable for the second research question was telehealth visits (Y/N) labeled as variable AJ152V2. This variable was measured by the question, "*During the past 12 months, did you receive care while in a health facility, from a doctor at another location, by use of a video device?*" followed by the options of "Yes," "No," "Refused," and "Don't Know" (CHIS 2019 Data Dictionary, 2020). The dependent variable for the second question was the self-reported number of emergency department visits in the last 12 months. The question used to measure variable AH95\_P1 was, "*During the past 12 months, how many times did you visit a hospital emergency room for your own health?*," followed by the option to input any value of 0 to 200 (CHIS 2019 Data Dictionary, 2020).

The third research question's independent variable was self-reported number of emergency department visits in the last 12 months. The dependent variable for the

third research question was race/ethnicity (OMBSRR\_P1). Race/ethnicity was measured by the following question, "*Please tell me what you identify yourself as,*" followed by the options of "Hispanic," "non-Hispanic White," "African American," "American Indian/Native," "Asian only," and "Other/two or more ethnicities" (CHIS 2019 Data Dictionary, 2020).

The fourth research question's independent variable was self-reported delays in care. This variable (AH22) was measured by the following question, "*During the past 12 months, did you delay or not get any other medical care you felt you needed—such as seeing a doctor, a specialist, or other health professional?,*" followed by the options of "Yes", "No", "Refused", and "Don't Know" (CHIS 2019 Data Dictionary, 2020). The dependent variable was emergency department visits (Y/N) in the last 12 months.

The fifth research question's independent variable was race ethnicity (OMBSRR\_P1). The dependent variable for this research question was also variable AH22, self-reported delays in care (CHIS 2019 Data Dictionary, 2020).

### **Data Analysis**

The study population included in this survey comprised individuals of 18 years of age or older who were both male and female. This study's independent variable was telehealth visits (Y/N), telehealth usage, and delay in care, while the dependent variable was emergency department visits and race/ethnicity.

A Chi-square was used for question one to analyze the relationship between utilization of telehealth services (Y/N) and utilization of emergency department visits (Y/N) in the last 12 months. A paired samples t-test was used to examine research

question two and evaluate the differences in between the number of emergency departments visits in the last 12 months between those who did and did not utilize telehealth services. A one-way analysis of variance (ANOVA) was used to analyze the third research question exploring differences in emergency department utilization (# of visits in the last 12 months) across races/ethnicities. A Chi-square test was also used to evaluate research question four and examine the relationship between self-reported delays in care (Y/N) and emergency department visits (Y/N) in the last 12 months. Lastly, a Kruskal Wallis test was used to answer research question five and to evaluate differences in self-reported delays in care (Y/N) across race/ethnicity categories.

The minimum sample size for the research questions was determined by G\*Power Software, version 3.1.9.2. The sample size calculation used a medium effect size of .3, an alpha level of 0.5, and power of 80% to determine a minimal sample size of 150 for the one-way ANOVA, the test with the highest sampling requirement of those used in this study. However, due to of the need to capture a diverse sample with adequate numbers of participants across race/ethnicity categories and within subsamples of participants responding to each survey question included in the analysis, a total sample size of 1,000 was used. The data were downloaded into SPSS version 26 for statistical analysis.

## Results

### Participant Demographics

Of the 1,000 participants, 66.6% (n = 666) were non-Hispanic Whites, 17.7% (n = 177) were Hispanic, 9.4% (n = 94) were Asian only, 3.6% (n = 36) were African Americans, 0.4% (n = 4) American Indians/Alaskan Native, and 2.3% (n = 23) were other/two or more races/ethnicities (see Table 1).

### Major Findings

#### *Relationship between Use of Telehealth Services and ED Visits*

The relationship between utilization of telehealth services and the utilization of emergency department visits in the past 12 months was calculated by a Chi-square test of independence. The Chi-square of independence compared the frequency of emergency department visits to those who did or did not use telehealth services. A highly significant interaction was found ( $X^2 = 8.478$ ,  $p = .005$ ). Patients who used telehealth services (30.8%) were more likely to go to the emergency room than patients who did not use telehealth services (16.6%) (see Table 2).

#### *Differences in ED Visits and Telehealth Use*

An independent samples t-test was calculated to compare the mean score of patients who used telehealth services and patients who did not use telehealth services in the past 12 months. No significant difference was found ( $t(989) = .670$ ,  $p = .248$ ). The mean of patients who used telehealth services ( $M = .12$ ,  $sd = .451$ ) was not significantly different from patients who did not use telehealth services ( $M = .08$ ,  $sd = .462$ ). See Table 3 for results.

### ***Differences in ED Visits across Race/Ethnicity***

In order to analyze the differences of the number of times visited the emergency department the past 12 months among race/ethnicities, a one-way ANOVA was used. The results indicated that there was a significant difference emergency department visits across race/ethnicities, ( $F(5, 994) = 2.76, p = .017$ ). Hispanic participants ( $M = .11, sd = .494$ ) had a relatively high mean value on the number of times visited the emergency department the past 12 months compared to non-Hispanic white ( $M = .08, sd = .448$ ), African American ( $m = .03, sd = .167$ ), American Indian/Alaskan Native ( $M = .00, sd = .000$ ), and Asian respondents ( $M = .01, sd = .103$ ). Participants who identified as other or two or more races/ethnicities had the highest mean value and greatest variation in the amount of visits to the emergency room ( $M = .39, sd = 1.196$ ). See Table 4 for results.

### ***Relationship between Self-Reported Delays in Care and ED Visits***

A chi-square of independence was calculated comparing the frequency of emergency department visits to patients who they did or did not have delays in medical care. A highly significant interaction was found ( $X^2 = 13.891, p < .001$ ). Patient who did not have delays in medical care were more likely to visit the emergency room (73.1%) than patients who did have delays in medical care (26.9%). See Table 5 for results.

### ***Differences in Self-Reported Delays in Care across Race/Ethnicity Categories***

A Kruskal Wallis test was used to answer the last research question to compare self-reported delays in medical care across race/ethnicity categories. The number of individuals in each race category was Hispanic ( $n = 177$ ), non-Hispanic



white (n = 66), African American (n = 36), American Indian/Alaskan Native (n = 4), Asian (n = 94), and other/two or more races/ethnicities (n = 23). Results indicated significant differences in compare self-reported delays in medical care across race/ethnicity categories ( $H(5) = 12.318, p = .031$ ). Delays in medical care did vary among ethnicities. See Table 6 for results.

## Discussion

### Summary of Major Findings

The purpose of this study was to explore trends and relationships between self-reported telehealth utilization and emergency department utilization across race ethnicity categories. In addition, this study sought to determine if there were differences in delays in care among different racial and ethnic backgrounds.

The first research question analyzed the relationship between the utilization of telehealth services and utilization of emergency department visits using a Chi-square. According to the results, the null hypothesis was rejected, indicating a significant interaction between telehealth services and emergency department visits. These results were consistent with previous research regarding telehealth being correlated with emergency department visits. According to Perry et al. (2010), telehealth visits that are associated or lead to emergency department visits can be used to estimate future visits to the emergency departments. However, according to recent research, telehealth services have led to a decline in emergency department visits (Boserup et al., 2020; Pulcini et al., 2021). Despite the results not aligning with prior research, the results are still essential to make improvements in health equity.

A paired sample t-test was used to help evaluate the differences between the number of emergency department visits in the last 12 months between those who did and did not use telehealth services and answer the second research question. It was hypothesized that there would be a relationship between the number of ED visits and telehealth usage. Results indicated that there wasn't a statistical significance in the number of ED visits and telehealth usage. These results were inconsistent with the

first research questions findings, indicating the number of ED visits is not related to telehealth utilization. However, utilization of both services in general may be blamed for higher number of emergency department visits due to outside factors such as insurance.

The third research question sought to identify a difference in emergency department utilization across races and ethnicities using a one-way ANOVA. According to the results, the null hypothesis was rejected, indicating a significant difference in emergency department utilization across races and ethnicities. In prior research, racial and ethnic disparities in delays in care were demonstrated in emergency department visits (Rodriguez, 2021; Goya et al., 2015). More specifically, delays in care were shown among Hispanic and Black populations (Zhang et al., 2020). These groups have historically experienced decreased health care access overall and have had disproportionately higher mortality and morbidity (Lowe, 2021).

The fourth research question examined if there was a relationship between self-reported delays in care and emergency department visits in the last 12 months. The results indicated that there was a significant relationship between self-reported delays and emergency department visits in the last year. The null hypothesis was rejected.

Lastly, when looking at the differences in self-reported delays in care across race/ethnicities, it was hypothesized that there was a difference in delays in care across race and ethnicities. Results indicated that there was a difference in self-reported delays of care across racial categories. To illustrate, those who reported higher accounts of delays in care were Hispanics, people of other/two or more races,

and Blacks. Zhang et al. (2019) stated that Blacks and Hispanics experience longer wait times and overall visits than their White counterparts. The evidence has suggested this disparity occurs because, historically, Hispanics and Blacks are uninsured and have significantly limited access to healthcare services (Lowe, 2021).

### **Public Health Implications**

This study compared healthcare disparities across race and ethnicities, delays in care, emergency department visits, and telehealth visits. The results portrayed a gap in the self-reported utilization of healthcare services among the Black and Hispanic population. The information obtained from the study can be helpful to public health professionals, public health agencies, community members, and policymakers seeking to understand the trends in utilization and mobilize health professionals to reduce health care disparities and increase access to healthcare resources.

Although there are some programs which in the U.S. that offer access to affordable healthcare services, there are still individuals who do not seek or receive treatment. These affordable health care services cause barriers to participation and barriers that limit the adoption of telehealth (AHA, 2019). The American Hospital Association (AHA, 2019) stated that there is limited coverage and payment options for many telehealth services. There are also few rural facilities that deploy telehealth services (AHA, 2019; Koma et al., 2021). Public health agencies and insurance companies should implement and broaden the marketing and advertising for telehealth services to their communities. Awareness should be brought that these services come with little to no cost and they offer access a variety of specialties in

multiple departments. Although there are limited specialties and departments in hospitals and health clinics, insurance companies should collaborate with public health agencies and professionals to determine patient demographics, community-based literacy, linguistics, and needs of some geographical regions and specialties within specific communities. Having these community demographics in geographical areas in need can help the overall communities health equity and provide better services for these areas.

Although there have been significant benefits of telehealth services in the United States, there are language barriers that pose a substantial challenge to 25.6 million people with limited English proficiency (Rodriguez et al., 2021). National and local policymakers should collaborate with health organizations to implement a thorough approach that promotes digital equity. Having some interpreters with some medical backgrounds in telehealth services could benefit the overall experience and outcome for the patients. Patients will feel more comfortable talking about their health problems and there will be less miscommunication issues that could have potentially lead to misdiagnosis. The Department of Health and Human Services could modify the National Standards for Culturally and Linguistically Appropriate Services guidelines on language equity to include provisions of an interpreter in telehealth visits. This change will help with any misunderstandings in telehealth visits patients may have with their doctors and make patients comfortable that their health problems are being taken care of effectively.

Being able to have access to telehealth services requires patients to have access to the internet and internet-capable devices. Access to internet and internet-

capable devices disproportionately affect minorities, such as Hispanics and Blacks (Jain et al., 2021). These minorities also often report lower rates of health care literacy (Zhang et al., 2020). That is why it is crucial to imply programs that provide these minorities with internet access and devices, because this could increase primary care visits within minorities and decrease non-emergent visits to the ED.

Public health agencies and hospitals should further expand telehealth access to minorities in need by ensuring patients can access telehealth services from their homes. Allowing the use of audio-only phone telehealth visit. Public health agencies should invest in infrastructure for less-resourced sites of care in specific demographic areas in need and provide internet access to those infrastructures.

### **Study Limitations**

This study had several limitations. CHIS 2019 data were collected using a self-reported questionnaire, so responses may involve recall bias. The answers to the questions asked are reflective, and the accuracy of the participants' responses could be associated with respondent bias. In addition, the interviews were done by telephone or online questionnaires, which include the possibility of having a weak connection between the participant and the interviewer. The discussion could have led to misunderstandings of the questions being asked due to service connection or language barriers.

Another limitation was that the CHIS interview was only conducted in California, limiting the sample to one geographic location. Given the participants included in the sample size for this study, there was unequal participation of individuals representing each race/ethnicity. The sample did not represent the entire

ethnic and race demographics in the State of California. More precisely, 17.7% were Hispanic, 66.6% were White, 3.6% were African American, 0.4% were American Indian/Alaskan Native, 9.4% were Asian, and 2.3% were another race. California's demographics consist of 39.4% Hispanic, 71.9% White, 6.5% African American, 1.6% American Indian/Alaskan Native, 15.5% Asian, and 4.0% another race. ("U.S. Census Bureau QuickFacts: California," 2019)

Finally, blank responses to questions in the questionnaire resulted from the ability for participants to skip questions. Having these empty responses to the questionnaire resulted in having a smaller sample size. A type II error could have been caused due to the sample size.

## **Conclusion**

This study aimed to identify differences between telehealth and its trends of use within emergency departments visit. In addition, this study sought to determine if there were differences in delays in care among populations of different racial and ethnic backgrounds. Results illustrated that participants from different races and ethnicities had different amounts of emergency department visits and delays in medical care. The Hispanic category reported having more emergency department visits compared to other ethnicities and race groups. Patients who used telehealth services were more likely to go to the emergency room than patients who did not use telehealth services. Also, patients who did not have delays in medical care were more likely to visit the emergency room than patients who did have delays in medical care. There was no difference in patients' telehealth utilization.

According to previous research and results from this study, people from different ethnicities have reported varying delays in medical care (Zhang et al., 2020). As previously mentioned in the study, public health should focus on assessing, identifying, and monitoring healthcare disparities in telehealth and emergency department visits. This vital information can help populations receive the adequate care they deserve and bring new tactics and resources to vulnerable people and situations.



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## Appendix A: Tables

**Table 1**

*Demographic Characteristics of California Health Interview Survey*

Variable	Study Participants (n=1000)	
	n	%
Gender		
Male	465	46.5
Female	535	53.5
Race/Ethnicity		
Hispanic	177	17.3
White, Non-Hispanic	666	66.6
African American	36	3.6
American Indian/ Alaskan Native	4	0.4
Asian	94	9.4
Other/Two or More Races	23	2.3
Age		
18-29 Years	71	7.1
30-39 Years	103	10.3
40-49 Years	112	11.2
50-59 Years	206	20.6
60-69 Years	247	24.7
70-79 years	184	18.4
80-84 Years	38	3.8
85+ Years	39	3.9

Note. N= sample size, %= Valid percentage. Data Source 2019 California Health Interview Survey



**Table 2**

*Frequencies and Chi-Square Results for Emergency department Visits and*

*Telehealth Utilization*

Telehealth Utilization	Visited ER		Did Not Visit ER		X <sup>2</sup> (1)
	n	%	n	%	
Used Telehealth Services	20	30.8	45	69.2	8.478
Did Not Use Telehealth Services	155	16.6	780	83.4	

\*p<.05

**Table 3***Telehealth Visits by the Number of Times of Emergency Room Visits*

Emergency Room Visits				t (989)	p
	<u>n</u>	<u>M</u>	<u>SD</u>		
Yes	65	.12	.451	.670	.248
No	935	.08	.462	.684	

**Table 4**

*Means, Standard Deviation, and One-Way Analyses of Variance in Emergency*

*Department Utilization across Race/Ethnicities*

Race/Ethnicity				F (5, 994)	p
	n	M	SD		
Hispanic	177	.11	.494	2.761	.017
White, Non-Hispanic	666	.08	.448		
African American	36	.03	.167		
American Indian/Alaskan Native	4	.00	.000		
Asian	94	.01	.103		
Other/Two or More Races	23	.39	1.196		

\*p<.05

**Table 5**

*Frequencies and Chi-Square Results for Emergency department Visits and Delays in Medical Care*

Delays in Medical Care	Visited ER		Did Not Visit ER		X <sup>2</sup> (1)
	n	%	n	%	
Had Delays	47	26.9	125	15.2	13.891
Did Not Have Delays	128	73.1	700	84.8	

\*\*p<.001

**Table 6**

*Kruskal-Wallis H Test Comparing Delays in Care Across Race/Ethnicity*

	<u>N</u>	<u>df</u>	<u>p</u>
Self-reported delays in care across Race/ethnicities	1000	5	.031

\*p<.05