

Utilization of Emergency Visits and Sources of Care: Factors Related to Educational Attainment

by

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Abstract

Over 130 million estimated emergency department (ED) visits occur in the United States each year (Vladutiu et al., 2019). A large population of adults who are low income do not have a usual source of health care leading to avoidable ED visits. The purpose of this study was to identify if there was a significant difference in the self-reported usual source of care and the utilization of emergency room visits across educational attainment levels in adults in California. Research showed that educational attainment was associated with a usual source of care and reduced ED visits (Jonassaint, 2016). This study included data from the 2018 California Health Interview Survey (CHIS). Chi-square tests of independence test were used to separately evaluate differences in the self-reported usual source of care and individual visits to the ED in relation to educational attainment. This study's findings determined a statistically significant association between educational attainment and usual source of care ($p \geq 0.05$). No statistically significant association was found between educational attainment and emergency visit ($p \geq 0.05$). Different factors contributed to these findings, including the CHIS sample relying on adults who were home during regular working hours. Therefore, results may not have accounted for a representative sample of all low-income groups who experience disproportionate access to care. Future research to include an evaluation of how to best define categories for capturing different types of usual sources of care. This information was essential to improve health disparities and quality based on educational attainment.

Keywords: level of educational attainment, usual source of care, emergency room visits, misuse of emergency department, income levels CHIS

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Review of Literature

Introduction

Studies showed misuse of emergency department (ED) utilization may be associated with educational attainment and knowledge of usual sources of care services aside from emergency visits. This misuse and overuse of the ED as a primary source of care has also been shown to lead to an increase in medical costs on insurance information needs (Lockwood, 2019).

Researchers from the Agency for Healthcare Research and Quality (AHRQ) performed study and concluded that only 8% of adults age 35 years and older had received all their high priority prevention recommended services (Palmer, 2018). Another study utilizing data from the Centers for Disease Control and Prevention's (CDC) National Hospital Ambulatory Medical Care Survey a statistical survey of ED visits for 2016 and estimated there was a 7% increase in emergency room visits from 2015-2016. In 2016, there were a total of 145.6 million visits, and in the past ten years, it had increased by 61.2%. Overall, ED usage continues to increase for non-urgent visits (Augstine, 2019).

In 2014, there was an estimated 137 million ED visits that occurred across the United States. Patients without a high school education were found to be three times more likely to visit the ED compared to those with post-secondary education. According to Vladutiu et al. (2019), a study conducted found that there was a high utilization of emergency care by pregnant Medicaid in North Carolina. The study demonstrated a need to improved access to care by educating patients of resources to get specialty care, such as pregnant women who do not have a primary obstetric care provider. The researchers concluded it was essential to educate women about available services and how to utilize them appropriately (Vladutiu et al., 2019).

In another study by Jonassaint (2016), it was mentioned that elevated ED visits were linked to patient's lack of knowledge about when to utilize different levels and types of care, such as the emergency room, urgent care, and primary care physician's office. The study also illustrated that those with no high school degree and with a high school degree or GED experienced a higher number of ED visits by three times the amount compared to post-secondary groups (Jonassaint, 2016).

There have been many studies that been conducted to identify the association of ED utilization and usual sources of care with educational attainment. According to the literature, these factors were related to creating more institutional care programs that can be culturally sensitive and relatable. Previous studies determined it is important to provide the resources in order to reduce misuse of ED services and increase the levels of sources of care before a patient goes to the ED.

Education Attainment

A recent study concluded that pediatric emergency visits were frequently used for non-urgent medical complaints. Hospitals and EDs may suffer from overcrowding, which impacts the quality of health care due to the misuse of EDs. In that study, there were 117 participants, and more than half of the sample had less than a high school education. The results of the study demonstrated that participants with caregivers and who had completed high school had lower odds of using the ED for non-emergent services (Lockwood, 2019).

Another study conducted mentioned that patients who had low health literacy and unscheduled returns to the ED reflected a lack of comprehension of medications and follow-up plans. There were 431 patients in the study, including 13.2% who had inadequate health literacy, 76.3% with adequate health literacy, and 10.4% with marginal health literacy. The researchers

concluded that patients with primary care physicians had fewer ED visits than those who did not have a primary care physician available. Also, uninsured patients received the majority of their care from Federally Qualified Health Centers (Griffery et al., 2014).

According to *The Open Diabetes Journal* by Alguwaihes and Shah (2009), one study examined the association between educational attainment and utilization of the health care system and self-care behaviors by individuals with diabetes with equal access to a physician and hospital care. The report also indicated that, among the 578 participants, 56% reported high school education or less, which was classified as low educational attainment. Individuals with high educational attainment were more likely to report that a specialist or paramedical practitioner was their most responsible provider. Additionally, they were more likely to follow a meal plan and less likely to smoke cigarettes. Those with low educational attainment were more likely to rely on their primary care physician for care, while high educational attainment was reliant on specialists because of patient request or physician recommendations. Individuals with higher educational attainment reported a greater understanding of the importance of preventive care, such as screening tests or as self-management for preventive measures. They were also shown to have a greater awareness of, motivation for, and ability to implement healthy behavior for better diabetes care. Individuals with low educational attainment were found to be more likely to make clear decisions based on income and insurance status and coverage as factors for barriers to care (Alguwaihes & Shah, 2009).

Chang, Patherg, Cueto, Li, Singh, Kenya, Alonzo, and Carrasquillo (2018) studied the results of a one-year community health worker intervention to improve access to care and service utilization among Latinos with diabetes. Interventions included health education, counseling, navigation assistance, social services, and social support. They showed that 30% of participants

reported inability to access care, 28% reported inability to access medication, and 28% had an inpatient stay during the yearlong study (Chang et al., 2018).

According to a report published in *Geriatric Nursing* in 2017, differences in education were identified as a strong predictor associated with inadequate health literacy for both sicker and healthier populations. An education session focusing on educating individuals with various health literacy levels about consent forms, health plan choices, medication labels and instructions, and advance directives with simplified reading materials was recommended to improve the knowledge of reading health-related material to make decisions about patients' health (MacLeod, 2017).

Additionally, it has been shown that lower levels of education and income are related to reduced usage of preventive care in China (Huang et al., 2016). Almost 60% of the participants involved in a study by Huang had completed middle school or high school, which was significant to the study, in comparison to university. The results showed less educated participants were less likely to use preventive care services. In the study, education attainment was positively related to preventive care utilization. According to this study, current health insurance arrangements may fail to reduce inequalities relating to preventive care because the level of preventive care usage was low in those that had low income and did not have university-level education (Huang et al., 2016).

Usual Source of Care

Bustamante et al. (2012) examined responses from 3,638 participants based on the California Health Interview Survey (2007) and found that doctor visits and having a usual source of care showed a statistically significant difference between documented and undocumented immigrants from Mexico. Undocumented immigrants from Mexico were found to be 27% less

likely to have visited a doctor with 35% reporting no usual source of care in the previous year as compared to documented Mexican immigrants. Seventy-eight percent of documented immigrants in the study and 60% of undocumented immigrants had a doctor's visit in 2007. The average number of physician visits for documented immigrants was 3.24, which was significantly greater compared to 2.26 in those undocumented immigrants (Bustamante et al., 2012).

According to Cutilli, Simko, Colbert, and Bennet (2018), it is important for healthcare providers to educate older adults in method to seek care. The researchers emphasized older adults with low health literacy were at a higher risk for health disparities. Additionally, they found individuals with lower-income and educational attainment have lower health literacy and experience health disparities. It was proven that a low health literacy score means less knowledge, skills and health education as a selection for sources of care. In order to reduce the ability to experience health disparities, there needs to be more knowledge to improve patients' health literacy (Cutilli et al., 2018).

A study conducted in New York City among Asian immigrant nail-salon workers focused on understanding healthcare utilization for that population. Nail salon workers in the United States are more likely to have poor access to healthcare services, resulting in serious health consequences. They often have delayed or underutilized healthcare services and depend more on informal health services. The research surveyed 148 Asian immigrant women, and 77% had obtained at least a high school diploma, while 75% mentioned they had some form of health insurance. Within one year of the study, more than 80% of the participants utilized more than one type of health service, including primary care provider, women's health, ED or urgent care, hospital and/or traditional provider of Eastern medicine. The researchers concluded that due to

accessibility of access to care for the patients of Korean- or Chinese-speaking providers were able to receive needed care in New York City (Seo et al., 2019).

Purpose of the Study

The purpose of this study was to identify if there were significant differences in the self-reported usual source of care and the utilization of emergency department visits across educational attainment levels in adults in California. It was hypothesized that there was a difference in self-reported usual source of care across educational attainment categories. It was also hypothesized that there was a difference in whether or not an individual visit the ED was room based on education attainment.

Research Questions

In this study there were two research questions:

1. Is there a difference in self- reported usual source of care across educational attainment categories?
2. Is there a difference in whether or not an individual visit the emergency room based on educational attainment?

Hypotheses

It was hypothesized that there was a difference in self-reported usual source of care across educational attainment categories. It was hypothesized that there was a difference between individuals that visit the ED based on educational attainment.

Method

Design

This study used a cross-sectional design. Data were drawn from the 2018 California Health Interview Survey (CHIS), a cross-sectional study of California residents. CHIS is the largest state-based health information survey that provides essential data on people who live in California. The survey covers information regarding health status, health conditions, health-related behaviors, health insurance coverage, access to health care services and other health, and health-related issues (CHIS, 2018).

Focus in this study was on QA 18_H1 on, “Is there a place that you usually go to when you are sick or need advice about your health?”, and QA18_H3 on “During the past 12 months, did you visit a hospital emergency room for your health?” These questions were selected in order to understand participants' choice of usual source of care and how frequently the ED was used due to not having an usual source of care. The CHIS was developed by the UCLA Center for Health Policy Research, California Department of Health Care Services, and the California Department of Public Health (CHIS, 2018).

Procedures

Data was collected with SQL Server Reporting Services (SSRS), which is an independent research firm which continuously is a rolling timeframe with CHIS 2018 data being collected between June 2017- January 2019 (CHIS, 2018). CHIS fulfill their objective of capturing a statewide representative sample by using a dual-frame, multi-sample design, the random-digit dial (RDD). Data are collected via RDD using a blended home line and cell phone sample on a continuous basis to gather data and further research regarding a variety of different health topics. For the RDD interviews, about 50% of participants were contacted via cell phone while the

others were contacted on landlines. Cell phone numbers that were associated with children under 18 years old were deemed ineligible for participation in the survey (CHIS, 2018). For the purposes of the survey, the state is divided into 44 county categories, including 41 strata. Each county category is comprised of a larger, single county and three strata created by multiple smaller counties. Forty-two minutes was the average time required to complete the adult interview for the CHIS Survey, and children took about 19 to 24 minutes to complete it.

Due to the various cultural identities of residents living in California, the survey was conducted in different languages, including English, Spanish, Chinese (Mandarin and Cantonese dialect), Vietnamese, Korean, and Tagalog. To gain more sample coverage of California residents, the sample of individuals was chosen based on zip code limits. Also, to increase the sampling coverage across age groups, the data collection included oversampling of residents under the age of 65 years old to increase the likelihood of contacting families and gathering information from teens and children (CHIS, 2018).

Participants

The data used for this study included CHIS participants ages 18 years and older who were residents of the State of California in 2017. The sample size was calculated using G*Power Software, Version 3.1.9.2. Based upon the statistical tests performed, with a medium effect size of 0.03, an alpha level of 0.05, and a power of 80%, a minimum sample size of 108 participants was required. The survey conducted had a large sample size of adult respondents provided by the CHIS data; therefore, a 10% random sample was extracted from the original sample three times. The outputs presented by each random sample of the three random samples conducted were all similar and appropriate to represent the larger sample size. In order to assure a large enough sample in each of the categories and variable levels in the Chi-square analysis, the random

sample used for this study was 499 respondents, male ($n = 248$) and female ($n = 251$), from different ethnic backgrounds. The random sample was used to analyze the both research questions: “*Is there a relationship between usual source of care and educational attainment?*” and “*Is there a relationship between utilization of emergency room and education attainment?*” Participants were from a range of different age groups, ethnicities, English proficiency, and educational attainment levels.

Independent Variable

The independent variable for the first research question was participants’ level of educational attainment. This was measured by the CHIS question, “*Which is the highest grade of education you have completed and received credit for?*” Response options included no formal education, grade school, high school or equivalent, four-year college or university, graduate or professional school, two-year junior or community college, vocational, business, or trade school, refused, and don’t know (out of range). For this study, the data were recoded, and categories collapsed to represent low educational attainment (high school or below) and high educational attainment (some college and above) in alignment with the thresholds used in the literature and to combine the multiple aspects of life. These aspects included no formal education, grade school, high school or equivalent, which were labeled as high school or under, while four-year college or university, graduate or professional school, two-year junior or community college, vocational, business or trade school were labeled as some college or above.

Dependent Variable

There were two independent variables in this study. The dependent variable for the first research question was the usual source of care and frequency of visitations in the ED. The CHIS question used to measure the usual source of care was, “*What kind of place do you go to most*

often- a medical/is your doctor in a private doctor's office, a clinic or hospital clinic, an emergency room, or some other places?" Response options included doctor's office/ Kaiser/ other HMO, clinic/ health center/ hospital clinic, emergency room, some other place (specify: _____), no one place, refused, don't know. For this study, the data were recoded, and categories collapsed comparing those with a usual source of care of a doctor's office/HMO/Kaiser and community clinic, and others compared to those using the ED as a usual source of care or having no source of care. The other categories were combined into one.

The second dependent variable in this study was ED visits. The CHIS question used to measure utilization of the ED was, *"During the past 12 months, did you visit a hospital emergency room for your own health?"* Response options included yes, no, refused, and don't know. When calculating the Chi-square, only the responses of yes and no options were included.

Data Analysis

The first research question was answered using a Chi-square test of independence to determine if there was a relationship between the usual source of care and educational attainment. A Chi-square test of independence was also conducted to answer the second research question to determine if there was a relationship between self-reported ED utilization in the last 12 months and educational attainment.

Results

Participant Demographics

The random sample utilized for this study included data from the 2018 California Health Interview Survey (CHIS). The goal of the study was to explore the relationship between educational attainment and usual source of care as well as educational attainment and self-reported visits to the emergency room in the past 12 months. There was an equal balance of both genders among the study participants with male participants making up 49.7%, and female participants making up 50.3%. Most participants in the study classified themselves as White Non-Hispanic (59.5%) followed by Hispanics (22.2%), Asian (8.8%), African American (4.8%), other/two or more races (3.0%), and American Indian/Alaskan Native (1.6%). From the study, most of the participants had some college or above educational attainment (69.5%) (See Table 1).

Table 1*Demographic Characteristics of 2018 California Health Interview Survey Sample (n=499)*

Variable	<i>n</i>	%
Gender		
Male	248	49.7
Female	251	50.3
Race/Ethnicity		
Hispanic	111	22.2
White (Non-Hispanic)	297	59.5
African American	24	4.8
American Indian	8	1.6
Asian	44	8.8
Other/Two or More Races	15	3.0
Age		
0-64	154	80.2
65 and older	38	19.8
Annual Family Income		
\$0 to \$19,000	81	16.2
\$20,000 to \$39,000	95	19
\$40,000 to \$79,000	111	22.2
\$80,000 to \$99,999	37	7.4
Over \$100,000	175	35.2
Educational Level		
High School and Under	153	30.5
Some College or AA Degree	347	69.5

Note. N= sample size, %= Valid percentage.

Major Findings

For the first research question, a Chi-square test of independence was calculated to evaluate the relationship between educational attainment and self-reported usual source of care. The data were recoded for the usual source of care variable to combine the variable levels from: doctor's office/ Kaiser/ other HMO, clinic/ health center/ hospital clinic or community clinic into one category with all other categories being combined into one. A statistically significant association was found between educational attainment and usual source of care ($\chi^2(1) = 3.98, p \geq 0.05$). (See Table 2.) There is a 42% chance that if the participants have low education, they will have no usual source of care.

Table 2*Comparison of Educational Attainment and Usual Source of Care (n = 499)*

Variable	Usual Source of Care		Adjusted OR (95% CI)
	Yes	No	
Educational Attainment			
HS or under	126 (25.3%)	26 (5.2%)	*.578
Some college or above	310 (62.1%)	37 (7.4%)	(.336-.995)

Note. N = Total Number, % = Valid Percent; OR, odd ratio; CI, confidence interval. Chi-square test was used to assess the relationship between educational attainment and usual source of care * $p < 0.05$.

For the second research question, a Chi-square test of independence was calculated comparing the relationship between educational attainment and visits to the ED in the past 12 months. No statistically significant association was found between educational attainment and emergency visits ($\chi^2(1) = 0.23, p \geq 0.05$). (See Table 3.)

Table 3*Comparison of Educational Attainment and Visited Emergency Room in the Past 12 Months (n= 499)*

Variable	Visited Emergency Room For Own Health In Past 12 Months		Adjusted OR (95% CI)
	Yes	No	
Educational Attainment			
HS or under	34 (6.8%)	118 (23.7%)	*1.120
Some college or above	71 (14.2%)	276 (55.3%)	(.706-1.778)

Note. N = Total Number, % = Valid Percent; OR, odd ratio; CI, confidence interval. Chi-square test was used to assess the relationship between educational attainment and visited emergency room of * $p < 0.05$.

Discussion

Summary of Major Findings

This study aimed to establish if there were significant differences in the self-reported usual source of care and the utilization of the ED across educational attainment levels in adult California residents. The study examined a population of 499 participants who came from different ethnic backgrounds and age groups of 18 years old and above. Data were obtained from the 2018 CHIS.

While previous studies demonstrated an inverse relationship between low educational attainment accomplishment and utilization of emergency services, this study did not show similar results (Alguwaihes & Shah, 2009; Chang et al., 2018, Griffery et al., 2014; Huang et al., 2016; Lockwood, 2019; MacLeod, 2017). Several factors could have contributed to this result, including the CHIS sample relying on adults who were available to participate in a RDD telephone-based survey during regular working hours. These individuals may not account for or include a representative sample of all low-income groups who experience disproportionate access to care.

Despite the results not aligning with prior research, the results are still essential to public health interests as they clarify assumptions that there are different factors variables leading to these results. Additionally, they shed light on the fact that there are other factors than educational attainment to consider when discussing questions of access. The findings of this study suggest there may be other factors that may be related to the utilization of emergency visits beyond only education.

This study illustrated a relationship between educational attainment and self-reported usual source of care and was in alignment with previous studies that also illustrated a

relationship between educational attainment and usual source of care (Cutilli et al., 2018).

Previous studies showed that individuals with lower educational levels have lower health literacy and reduced access, leading to further health disparities and negative health outcomes.

Furthermore, this study underscores how education is an important factor and educating older everyone may help improve health literacy and reduce health disparities (Jonassaint, 2016).

Study Limitations

The study had several limitations. First, the interviews for the survey were conducted via telephone, which posed a limitation due to an unequal opportunity for participation across demographic categories. While the CHIS team makes various efforts to oversample specific ethnic groups and sub-groups across the State of California, there were still opportunities for exclusion and bias due to the manner in which the survey was conducted. This included the possibility that undocumented California residents may not have answered CHIS phone calls due to fear of affiliated government calls. Also, many individuals, regardless of documentation status may be hesitant to donate their time or not answer due to concerns of telemarketing. Increases in individuals lacking a home phone, not answering an unknown number, or the observable rise in unwanted calls could have limited the equality and diversity of participants in the study.

Another limitation was the amount of time it took to complete the survey. For this study, the average interview completion time was 42 minutes. Although this is an average, the study did not explain the complication of interviews that take explains why the amount of average interview time can take such a long period of time. There was also no way to ensure that the participants understood the questions from the interviewee over the phone due to language barriers in comparison to reading the questions, resulting in giving appropriate responses. The reliability of responses given to the interviewer were uncertain as the study was self-reported.

This was a limitation as results may not have accurately reflected the situation due to expectations of the questions being asked.

The final limitation was based on the limiting nature of the survey questions asked, *“During the past 12 months, did you visit a hospital emergency room for your health?”* A better crafted question that was not focused on a yes or no response but rather requested the quantity of times that participants had gone to the ED in the last year would have been to gather more information that is qualitative data. Another limitation was the method of the measurement and variable construction for the usual source of care. The answer choices included doctor’s office/Kaiser/other HMO, clinic/health center/hospital clinic, emergency room, some other place of care (specify: _____), no one place, refused, do not know. Letting the participants select from some other place, no one place refused, and do not know, limited the usability of the data. This could be improved in future studies by limiting the number of answers to only include specific location types, no one place, or do not know.

Public Health Implications

The findings from this study show that there was no relationship between educational attainment accomplishment and utilization of ED services. However, results from this study prove that there was a relationship between educational attainment and usual source of care. It is important to decrease disparities in healthcare access and outcomes as well as provide education and resources to enable individuals to access affordable care at the appropriate level and appropriate setting. It is also important for all individuals to understand where they can consistently access quality medical care and what resources exist for navigating the healthcare system. It has been suggested by MacLeod (2017) that with effective educational interventions, such as improving health literacy, which will improve patient satisfaction, and with better

compliance to preventive services and overall reduce healthcare utilization and spending (MacLeod, 2017). This shows that if participants have more knowledge or higher health literacy, it will better the chances of the participants utilizing appropriate usual sources of care.

Policy advocates and grant writers should work with other government agencies, such as Health Resources and Services Administration (HRSA), to invest more in clinics that reach out to the public to offer preventive services to more patients from diverse cultural backgrounds. Further research and funding efforts should also incentivize community clinics, HMOs, and private doctors to reach out to their participants' post-hospital discharge to seek the reason why they went to the ED and also follow-up with the patients more often for a better standard of care. Empowering different levels of health care providers to provide different resources could help patients utilize the different sources of care that are already available to the public.

Another factor in improving the usual source of care and educational attainment would be increasing the knowledge and importance of understanding when healthcare services should be utilized. It is important more individuals understand the access to other forms of healthcare services are available and this should be better broadcasted to the public. Additionally, local doctors' offices, Kaiser, health centers, hospital clinics, and community clinics should make their services more visible to the public. Not only can these alternative healthcare firms expand access to different types of services to the public, but this expanded access and utilization could increase the visibility and sustainability of these programs.

Expanding knowledge of healthcare services outside of the ED would also improve access to care. This could, then, lead to less overcrowding in EDs as individuals would be prompted to take advantage of the resources that are already available, regardless of educational levels. This promotion can be done with public school populations or in community resource

centers. There should be a method in the healthcare field to better understand those who are at higher risk of disparities in order to improve the quality of life and care in the health care field. It is important for the participants to understand the different usual sources of care to utilize instead of going to the emergency department for non- urgent situations.

Future Research

Further research must be conducted to evaluate the method of usual sources of care are selected. This information may become beneficial to utilize the usual source of care better to improve health disparities and quality based on educational attainment. There should also be a study conducted that measures the effectiveness of educational interventions, such as methods to improve patient satisfaction and health literacy, while also helping individuals improve preventive services to reduce the overuse of ED and better utilization of proper sources of care. This study and previous research highlighted the need for additional focused research on appropriateness of visits and utilization patterns of the Medicaid population (Vladutiu et al., 2019).

Future studies should evaluate potential for the expansion of community health centers, versus other sources of care, that go out to the public to advertise their services. Reaching out to the public through a community health center could improve the utilization of these services as the public would know who they are and how they can serve the community. Another important factor to consider is the ability to have all participants with insurance enrolled with managed care for better resources from the managed care for access to care on a doctor, specialist, emergency room, and other additional health-related resource.

A study that was conducted by Viramontes (2018) mentioned that Alta Med identified key five barriers to enrollment and patients having a usual source of care: lack of data training,

training module, productivity, and application process. Through collaboration, innovation, and outreach, they were able to successfully use it as best practice for enrollment purposes (Viramontes, 2018). Viramontes et al. (2018) mentioned that community health centers and academic partnerships with local organizations can help enroll people and also meet targeted outreach goals to help vulnerable populations. Therefore, more community-based community health clinics should be recognized for a community partnership. They should receive incentives for reaching out to new health insurance enrollees and bringing these individuals in to see the doctors for preventive exams.

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