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Disparities in Insurance Type among Minorities for Congestive Heart Failure Diagnosis in the Ambulatory Care Setting

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ABSTRACT

Background: Lack of access to healthcare, health insurance and health providers and access to quality healthcare is strongly related to socioeconomic inequalities. These inequities are thought to reflect social and economic disparities more than biological differences associated with the race of the individuals. *Purpose:* The purpose of this study was to determine the associations between ethnicity/race and method of payment with the diagnosis of new onset heart failure in the ambulatory care setting. Health care disparities have been well documented to exist in various demographics and socioeconomic statuses. Specifically, there are differences in access to and quality of healthcare between ethnic and racial groups; and additionally, the quantity and quality of care that a patient receives is dependent on the patients' insurance status. *Methods:* Data sets for this study were retrieved from the 2010 Centers for Disease Control and Prevention [CDC's] National Ambulatory Medical Care Survey (NAMCS) - as this is the most recent data available for analysis. The IBM SPSS Version 20.0 statistical software was used to conduct the analysis of the data. Cross-tabulation of the dependent and independent variables was completed to examine the prevalence of CHF diagnosis by insurance type and ethnicity/race. Correlation tests were run to determine if any significant correlations between the variable existed in the target population. Lastly, Chi-Square tests were analyzed on the independent variable to determine if there was a statistically significant association with the dependent variable. *Result:* The results supported past research which found that racial, ethnic, and socioeconomic disparities exist in health care. The data demonstrates the number of respondents' self-identified ethnicity/race cross referenced with the corresponding method of payment. In addition, the number of respondents' self-identified ethnicity/race was cross referenced with the number of new diagnosis of CHF. *Conclusion:* Disparities in the diagnosis of CHF are significantly associated with ethnicity, race, and insurance status. The results demonstrate that substantial differences exist between ethnicities and race in the diagnosis of CHF. Further, substantial differences were discovered in the diagnosis of CHF between the privately insured, publically insured, and the uninsured.

Keywords: accessible health care, health insurance, social-economic disparities, heart failure, minorities

INTRODUCTION

Lack of access to healthcare, health insurance and health providers and access to quality healthcare is strongly related to socioeconomic inequalities. These inequalities are thought to reflect social and economic disparities more than biological differences associated with the race of individuals. Among eleven wealthy industrial nations (Canada, France, Australia, Germany, the Netherlands, Norway, United Kingdom, New Zealand and Sweden), the

United States is ranked last for equity, efficiency and outcomes according to a 2014 study by the Commonwealth Fund. Socioeconomic disparities include inequities in work, wealth, income, education, housing, and overall standard of living, as well as barriers to high quality prevention, early detection, and treatment services (Cancer Facts and Figures for African Americans, 2013).

Lack of health insurance is the major factor that significantly contributed to poor quality of care for minorities in the United States. Fortunately, the Affordable Care Act reform focuses on reducing the disparities among minorities by expanding health insurance coverage for an estimated 32 million Americans through Medicaid and private coverage purchased throughout new State health insurance exchanges with the assistance of federal subsidies that started in 2014. The Affordable Care Act of 2010 (ACA, 2010) mandates universal coverage; however, providing health insurance at an affordable cost to everyone remained a major challenge. Heart Failure (HF) is a disease that afflicts about 5.1 million people in the United States, statistically, about half of the people diagnosed die within 5 years of the diagnosis (Centers for Disease Control and Prevention [CDC], 2014). Several factors have been identified to increase one's risk of developing Heart Failure (HF) which include: (1) smoking tobacco; (2) eating a diet high in fats, sodium, and cholesterol; (3) obesity; (4) and living a sedentary lifestyle (AHA, 2014).

Although the risk factors noted are modifiable, HF increasingly continues to affect the population in the United States. According to the CDC report, one in 9 deaths in 2009 listed HF as a contributing cause and it is estimated that HF costs the nation approximately 32 million dollars yearly in treatments, medications, health care, and missed work days (CDC, 2014). Much attention has been focused on education and lifestyle modification; however, disparities in access to health care may have an impact on attaining the necessary care to reduce the risks of developing HF. Moreover, poverty levels, insurance status, and ethnicity/race may contribute to the incidence of HF rates.

Symptoms of heart failure include chest pain, shortness of breath, activity intolerance and edema. Heart failure is a progressive disease that may lead to coronary artery disease, myocardial infarction, and death (National Institutes of Health [NIH], 2014). Appropriate HF treatment consists of frequent outpatient visits, elaborate drug regimens and active patient participation which can be intense and expensive. Annually, Heart Failure accounts for 12 to 15 million office visits and 6.5 million hospital days (Butler and Kalogeropoulos, 2008). Readmission rates may indicate failed therapy or poor patient adherence to the treatment regimen. The recurrent readmission and failed therapies increase health care costs; thus, the cost burden is then shifted to either private insurance companies or the government, and subsequently the paid by the tax payer. Much of the focus to prevent HF has been directed towards risk factor modification. However, risk factor modification can be challenging, especially when the targeted community is either uninsured or lacks the necessary resources (Rodriguez et al., 2011).

Bagchi et al. (2011) suggested that equal access to care may mitigate health disparities among the varying ethnic HF patients. Historically, minority groups have faced challenges in accessing health care. Uninsured populations are a burden on the health care system. Health disparities have proved to be persistent over the years as African American are three times more likely to die from heart disease compared to whites; and since 2007 inpatient care for people with heart failure has been mainly Hispanics/Latinos, Native Americans and Alaskan Natives (Bahls, 2011). Safety net hospitals have been overwhelmed with the amount of uninsured persons seeking care in their emergency departments (ED). In 2011, 51% of foreign born non-citizens were uninsured. This data reflects the current status of the Hispanic communities' inability to seek early intervention when suffering from a cardiovascular disease (Pew Hispanic Center [PHC], 2013).

Education level of the socially disadvantaged population will also contribute to the lack of understanding of public health insurance policies and procedures. Thus, a lack of education of the resources available to the public health insurance beneficiary may impact the amount of health care received and access to such care. Morgan et. al. (2008) found that poor understanding of public health insurance was associated with greater likelihood of delayed care and this finding was found to affect Hispanic populations more than Whites. Perceived and actual health care access is negatively impacted by the level of familiarity the person has to their health insurance. Health disparities are often discussed among primary care physicians as major problems and about 55% of them agree that minority groups receive less quality of care than the majority whites and about 21% are unsure of the less quality of treatment while 24% disagree that disparities occurred. Interestingly, 62% of the nation's physicians indicated they witnessed patients receiving poor quality health care due their race or ethnicity, according to the American College of Physicians (2010).

In the U.S. patients have access to public and private health insurance; however, the type of insurance one qualifies for is dependent on socioeconomic status and health status. Social disadvantaged and poor health patients were more likely to receive public health insurance; whereas, the socially advantaged and healthier patients were more likely to carry private health insurance (Jerant et al., 2012). Moreover, when health care services were rendered in health care organizations located in underserved communities the care rendered was of inferior quality. Heart failure patients with publically funded health insurance are at a disadvantage to the range of health care they receive.

Treatment intensity and the range thereof are affected by payer type. In a study that reviewed the type of treatment received was dependent on the payment method, Kapoor et. el. (2011), found that no insurance, Medicare, Medicaid payment type HF patients experienced greater mortality rates; longer hospital stays, and a decreased quality of care when compared to private pay HF patients. It has been widely documented that ethnic disparities exist in terms of access to care.

Racial and ethnic disparities persist in medical care for minorities with health conditions needing services and major efforts are needed to reduce or totally eliminate racial and ethnic health care disparities in the U.S. It is projected that by 2050 minority groups will account for almost half of the U.S. population. Health insurance is a determinate of the amount of health care that is utilized; as such, insured populations are more inclined to utilize health care services. The uninsured population on average received only about 55% of the health care services that an insured person received (Wang et al., 2013). In addition, educating the population on healthy eating habits fosters healthy food choices which lower the risk of developing heart failure. However, disparities exist in the access to healthy foods and its affordability. In the United States, 16.1% of the population are food insecure and illness associated costs related to food insecurity amounted to 130.5 billion dollars in 2010 (Shepard et al., 2011).

It has been well established that poverty level and access to health care are negatively associated with health status. In other words, an impoverished person has less access to health care services; thus, they may experience inferior health. In the United States, Hispanic and Black populations are a subset of the impoverished population; as such, they experience disproportionate access to health and are prone to suffer from chronic illnesses (Kirby and Kaneda, 2013). Cardiovascular disease was the leading cause of death for Hispanic males and adults. The AHA noted that 17.3 % of Hispanic adult males and 9.6% of adult Hispanic females were current smokers and only 15.7% of Hispanic adults met the minimum aerobic activity and muscle strengthening guidelines set by the CDC (AHA, 2014). Further, 81.3% of Hispanic men and 8.2% of Hispanic women were considered overweight of which 36% of men and 44.8% of women were obese (AHA, 2014).

The Efforts to improve Heart Failure by reducing the incidence with risk factor modification have shown improvement in the overall risk factor metrics. Yet, differences in the control of risk factors continue to be evident when viewed by ethnicity/race and socioeconomic status. Hispanics had poorer control over glycemic indexes when compared to White adults. Disparities continue to affect the ability to control risk factors such as diet control. In addition, disparities in the access to health care have also contributed to the incidence of HF among Hispanics (McWilliams et al., 2009).

METHOD AND DATA ANALYSES

Data sets for this study were retrieved from the 2010 Centers for Disease Control and Prevention [CDC's] National Ambulatory Medical Care Survey (NAMCS) - as this is the most recent data available for analysis. The dependent variable used in the analysis was "congestive heart failure" and the independent variables were "race," "ethnicity," and expected source of payment for this visit" as labeled in the NAMCS 2010 questionnaire. The study's aim is to identify whether the diagnosis of heart failure has associations with method of payment and ethnicity/race and to determine if there is a correlations between the diagnosis of HF, insurance type and race/ethnicity.

The IBM SPSS Version 20.0 statistical software was used to conduct the analysis of the data. Cross-tabulation of the dependent and independent variables was completed to examine the prevalence of CHF diagnosis by insurance type and ethnicity/race. Correlation tests were run to determine if any significant correlations between the variable existed in the target population. Lastly, Chi-Square tests were analyzed on the independent variable to determine if there was a statistically significant association with the dependent variable. Each independent variable was tested separately. Statistical significance was determined by deeming a value of $p<0.5$ as a statistically significant association.

Hypothesis Testing

The first hypothesis: H_0: No significant differences exist in the diagnosis of Heart Failure based on ethnicity/race, was cross-tabulated with the dependent variable of CHF diagnosis with the independent variable of ethnicity/race. A Chi-spare test was used to determine significance with a p value of $< .05$. The second hypothesis: H_0: No significant differences exist in the diagnosis of Heart Failure based on insurance type, was cross-tabulated with the dependent variable of CHF diagnosis with the independent variable of insurance type. A Chi-spare test was used to determine significance with a p value of $< .05$.

FINDINGS

A total of 31,229 patient records were retrieved from the NAMCS 2010 data set. Responses to self-identified ethnicity/race that met the criteria, for the purposes of this study, totaled 27,312 patient records. Further, the number of responses for insurance type included in this study totaled 32,990 records. The sample population was not excluded in relation to other demographics; thus, no exclusions were made on the basis of age or gender. Analysis of the sample population data sets was conducted distinctly by insurance type and ethnicity/race and the correlation with CHF diagnosis. The total population for insurance type responses is noted as N=32,990 and total population for ethnicity/race respondents is noted as N=27,312.

Cross Tabulation

Statistical analysis of the NAMCS data in the selected population was cross tabulated to identify descriptive interpretation of the results. The data demonstrates the number of respondents' self-identified ethnicity/race cross referenced with the corresponding method of payment. In addition, the number of respondents' self-identified ethnicity/race was cross referenced with the number of new diagnosis of CHF. The cross tabulation was further calculated to identify the percentage of positive diagnosis of CHF within the insurance type and ethnicity/race. The study has taken the freedom to assume that self-pay insurance status indicates the respondent did not have health insurance and Medicaid and Medicare insurance types were group in a "Public Insurance" category.

Ethnicity/Race

The total number of patients in the study sample with the self-identified categories included in the study was 27,312 patients. Figure 1 illustrates the percentage of respondents by ethnicity/race. The largest group was comprised of the White category (72.3%) followed by Hispanic (12.2%) and Black/African American (10.5%). Asian, Pacific Islander, and American Indian/Alaskan Native collectively composed 5% of the sample population.

Insurance Status and Ethnicity/Race

The largest group of patients with private insurance was patients that self-identified as Pacific Islander 63% (N=49). However, of all ethnicity/race groups, the largest group of patients self-identified as White (N=19,753) and reported that 60.2% of Whites had private insurance. The group with the least percentage of private insurance holders was the America Indian/Alaskan Native (N=320) group which had 17.8% of respondents reporting as private insurance holders. However; the Hispanic group with a population of 3327 respondents (second largest ethnicity/race group) reported only 31% as private insurance carriers. Of the Black/African American group (N=2868), 39.5% of respondents reported private insurance.

It was assumed that groups that were deemed self-pay did not have any type of insurance. The American Indian/Alaskan group had 9.1% of respondents without insurance. Of note, the Hispanic group reported 8.5% as having no insurance; nonetheless, had a larger number of respondents than the American Indian/Alaskan group. The Black/African American group revealed an 8% no insurance rate. The Hispanic group demonstrated the highest percentage of patients with public insurance at 54.2% (N=1802) and the Black/African American group demonstrated the second highest percentage at 53.9% (N=1545). When comparing all categories of ethnicity/race, excluding the White group, Hispanics had the highest percentage of patients on public insurance or no insurance. Furthermore, the Hispanic group was the largest minority group in the sample population. Hispanics were followed by the Black/African American group in the percentage of patients on public insurance and no insurance.

CHF and Insurance Type

Table 1 below demonstrates the results of CHF diagnosis as cross tabulated with insurance type. The table does not account for ethnicity/race. The sample population was composed of patient who had an identified method of payment in the NAMCS 2010. The total sample population size was N=32,990. The majority of respondents totaled 18,144 patients in the private insurance group followed by the public insurance patients (N=12,908). Medicare beneficiaries and private insurance carriers made up the largest group of patients diagnosed with CHF with 1.11% and 0.73% respectively. Patients without insurance had 0.05% of the total diagnosed with CHF within the sample population.

Table 1. CHF diagnosis by insurance type

Insurance Type	CHF				
	No		Yes		Total
	N	%	N	%	%
Medicaid	5054	98.7%	65	1.3%	0.20%
Medicare	7424	95.3%	365	4.7%	1.11%
Private	17902	98.7%	242	1.3%	0.73%
Self-Pay (No Insurance)	1923	99.2%	15	0.8%	0.05%
Total	**32303**		**687**		**32990**

Table 2. CHF diagnosis by ethnicity/race

Ethnicity/Race	CHF				
	No		Yes		Total
	N	%	N	%	%
Hispanic	3303	99.3%	24	0.7%	0.09%
White	19391	98.2%	361	1.8%	1.32%
Black/African American	2804	97.8%	64	2.2%	0.23%
Asian	939	97.0%	29	3.0%	0.11%
Pacific Islander	75	97.4%	2	2.6%	0.01%
American Indian/Alaskan Native	316	98.8%	4	1.3%	0.01%
Total	**26828**		**484**		**27312**

CHF and Ethnicity/Race

Diagnosis of CHF was cross tabulated with ethnicity/race. The total population in the sample used for the analysis was 27,312 patient records. Table 2 illustrates the percentage of CHF diagnosis among the sample ethnicity/race population. The White category was the largest group diagnosed with CHF in the sample of population with 1.32%. Of the minority groups Black/African American reported the highest CHF diagnosis (0.23%) followed by Asian (0.11%) and Hispanic (0.09%).

Hypothesis Testing

The data sets where analyzed to determine the significance in the associations between the variables identified. A Chi-Squared test was employed using the data that was cross-tabulated. The analysis revealed the critical value (CV), degrees of freedom (*df*), and the *p* value. Significance of the associations were determined based on a *p* value of <0.05.

Hypothesis 1

The null hypothesis established that: H_0: No significant differences exist in the diagnosis of Heart Failure based on ethnicity/race. A Chi-Squared test was run to determine the significance of the associations between CHF and ethnicity/race and it was determined that the null hypothesis be rejected. The Chi-Squared test value of 30.942 with a *df* of 6 and *p* value of 0.000 is statistically significant. Therefore, the analysis does not support the Hypothesis 1. Thus the null hypothesis is rejected. The results indicate that there are significant differences in the diagnosis of CHF based on ethnicity and race.

Hypothesis 2

The null hypothesis established that: H_0: No significant differences exist in the diagnosis of Heart Failure based on insurance type. A Chi-Squared test was run to determine the significance of the associations between CHF and insurance type and it was determined that null hypothesis can be rejected. The Chi-Squared test was run for Self-pay; Medicare, Medicaid, and Private insurance types and CHF diagnosis. Self-pay and CHF produced a CV of 10.047 with a *df* of 1 and *p* value of 0.002 deeming the association statistically significant. Medicare insurance type and CHF rendered a CV of 529.718 with a *df* of 1 and *p* value of 0.000 deeming the association statistically significant. Medicaid was analyzed with CHF and produced a CV of 7.879 with a *df* of 1 and *p* value of 0.005 deeming the association statistically significant. Lastly, Private insurance and CHF diagnosis produced CV of 40.990 with a *df* of 1 and *p* value of 0.000 deeming the association statistically significant. The Chi-Squared analysis revealed the associations of insurance type and the diagnosis of CHF are statistically significant. Therefore, the analysis does not support the Hypothesis 2 and the null hypothesis is rejected. The results indicate that there are significant differences in the diagnosis of CHF based on ethnicity and race.

CONCLUSION AND SUMMARY

Research has demonstrated the racial and ethnic disparities that exist in access to health care. It has also been documented that the type of insurance one carries may be a determinant of the quality and amount of health care that is received. The objective this study aims to demonstrate is the associations between racial, ethnic, and insurance status disparities in the diagnosis of CHF. As discussed earlier, patients of lower socioeconomic status tend to be insured by government provided insurance or have no insurance coverage at all. To this end, the underinsured patients often receive substandard quality of care. The current study has supported the theories which show racial, ethnic, and insurance status disparities in health care.

The MAMCS 2010 data set analysis results revealed that the majority of the group sampled where from the White group, of which, the majority were privately insured and publicly insured. Consequently, the diagnosis of CHF within this group in the ambulatory care setting was the highest among all groups. The findings support the postulated theories that increased access to health care with robust insurance coverage leads to enhanced health care. Thus, it is expected that the White group would have more diagnoses based on increased health care utilization, enhanced access to screening exams, and vigorous treatment options. Research has shown that comprehensive insurance status translates to improve health. Preventable hospital readmissions were noted to be higher with Black/African American and Hispanic groups when compared to the White group (Ladtika and Ladtika, 2006).

The findings support the conclusions of past research in this topic whereby the top two minority groups (Hispanic and Black/African American) had increased rates of patients with no insurance when compared to the White group. This finding exemplifies the minorities' rate of CHF diagnosis when compared to the White group. As discussed earlier, the White group was more often diagnosed with CHF than the other groups; however, the White group was followed by Hispanic and Black/African American group on the diagnosis of CHF. Insured Black/African Americans were more likely to have substantially more hospital use than Whites in CHF care (Lafata et al., 2004). This suggests that although the Black/African Americans were insured, poor outpatient treatment contributed to the negative health outcomes and increase hospital use.

The Chi-Squared test yielded values that support past research findings. Disparities in access to care by historically underserved ethnic and race groups have been reported by previous research. The results in this study demonstrated that there are significant associations in the diagnosis of CHF based on insurance type and ethnicity/race. The White group was almost 5 times more likely to be insured than the Hispanic group and almost 6 times more likely than the Black/African American group. The inequity in the insurance status may explain the number of CHF diagnoses within the White group. The White group had more CHF diagnosed when compared to the other groups, the fact remains that the high degree of insurance within the group has translated to solid health care access. The implementation of the Affordable Care Act (ACA) may have an impact in the ethnic and racial disparities in access to health care. The Black/African American-White and Hispanic-White differential in rates of insurance coverage, could be reduced by half and one quarter respectively, with the implementation of the ACA and reduce the ethnic/racial disparities (Clemens-Cope et al., 2012).

Thus, based on the evidence, which suggests disparities of access to care, the CHF diagnosis rates in aforementioned groups is significant. Moreover, the sample population included in this study was limited to care sought in the outpatient setting. Future research may yield different results when care sought in the emergency room is examined. In addition, the sample size was relatively broad. Excluding children under age 18 and the elderly over 65 (typically adequately insured group) may yield results in support of the study's findings.

In summary, disparities in the diagnosis of CHF are significantly associated with ethnicity, race, and insurance status. The results demonstrate that substantial differences exist between ethnicities and race in the diagnosis of CHF. Further, substantial differences were discovered in the diagnosis of CHF between the privately insured, publically insured, and the uninsured. Many factors may contribute to the final results. The present study included all ages and gender. Thus the study was limited by the broad scope included in the sample. Children are not typically diagnosed with CHF. As such future research may exclude children and focus on the Adult population. This cross sectional included a relatively small sample population. The results are limited to the responses included in the analysis. Future research is needed in a larger scale to be able to confidently make associations to the greater whole.

Diagnosis of CHF in the outpatient setting is more likely to occur with the insured population. To this end, the ample population diagnosed with CHF tended to be insured. Therefore, the study was limited to a population that was more likely to be insured. Future research should focus on the emergency room diagnosis of CHF to better understand the differences in CHF diagnosis to the variables identified in this study. NAMCS 2010 data set included a sample population based on diagnosis of CHF by the ambulatory/outpatient care provider. Most outpatient's settings lack the resources and equipment to objectively make a thorough assessment of the diagnosis of CHF. The study supported current research in the incidence of CHF and the association with insurance status and ethnicity/race; albeit, with a small sample size. The intent of this study is to stimulate and foster additional research in the topic to mitigate and eventually eliminate the ethnic, racial, and insurance status disparities in health care.

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