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Impact of Type 2 Diabetes and Hypertension on Allocation of Grant Funds in Federally Qualified Health Centers

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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MS, Liberty University, 2017

B.S., Eastern Kentucky University, 2012

Doctoral Study Submitted in Partial Fulfilment

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Doctor of Healthcare Administration

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Abstract

Limited resources exist for managing the increasing cases of hypertension and type 2 diabetes, which underlines the need to continuously review reimbursement plans to ensure care affordability for chronic illness. The purpose of this quantitative study was to determine whether a correlation existed between the number of patients with type 2 diabetes, hypertension, and demographic characteristics (independent variables) seen at Federally Qualified Health Centers (FQHCs) and the allocation of grant funds from Health Resources and Service Administration (HRSA) (dependent variable) from 2016 – 2020 among adults 18 years old and older in the United States. Guided by the Transaction Cost Economics Theory and the Chronic Care Model, utilizing a sample size of 6862, a correlational analysis was conducted using data from the *data.HRSA.gov* database. The results indicated that the number of type 2 diabetes and hypertension patients supported by FQHCs constantly increased over the years as did the cost per patient. Similarly, the results on grant fund allocation showed an increase. The finding implied that an increase in the number of patients was accompanied by rise in the amount of funds released for FQHCs. However, the results revealed bias against Native Hawaii and African American patients in allocation of grant funds to FQHCs. The application for professional practice is that policies for allocation of grant funds should be reviewed to minimize ethnic bias in assessing FQHC services. Meanwhile, an implication for positive social change is the need to create public awareness programs on healthy lifestyle to reduce the identified rising chronic illness cases.

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Dedication

I dedicate my work to my family. A special thanks to my loving parents. To my dad Doyle Mullins whose words of encouragement keep me going. In loving memory of my mom Vicki Mullins who I know would be so proud of me. To my daughter Jaelyn Mullins, who was with me from start to finish and has always been my biggest cheerleader. To my fiancé Tim McDaniel who has always made me feel like there is nothing I cannot accomplish, and to Grace McDaniel and Caden McDaniel for their sweet encouragements and their willingness to celebrate my accomplishments.

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Section 1: Study Foundation and Literature Review

Introduction

This study addressed pertinent issues in healthcare administration with the expectation to examine trends in the allocation of grant funds awarded to Federally Qualified Health Centers (FQHCs) for type 2 diabetes and hypertension patients. This study also addressed the Federally Qualified Prospective Payment System (FQHC PPS) reimbursement rate compared to the actual cost per patient. For that reason, key similarities and contrasting situations were analyzed, and policy insights were drawn from the data for strategic decision-making over the disbursement of financial resources. The pursuit undertook a correlation-based investigation in the methodology framework to understand the relationship between the desired variables. The original justification of the study potentially revealed underlying disparities in the grant funds awarded to FQHCs and the increasing number of type 2 diabetes and hypertension patients. Likewise, the research was established to uncover inequities in Federally Qualified Health Center Prospective Payment System reimbursement rates received by FQHCs compared to the accrued treatment cost.

As mentioned earlier, the potential outcomes of the study may sensitize the governing health authorities in the United States to formulate more equitable policies regarding dispensing funds at the federal level. Overall, this study had four key sections as follows: (a) Section 1 captured the foundation of the research and the review of literature whereby a background has been provided, a statement of the problem, research

questions, objectives, assumptions, delimitations, limitations, the definition of key terms, the significance of the study, and a search strategy; (b) Section 2 featured the research design and collection of data, the methodology was stated, philosophical paradigm, threats to validity, and identification of the ethical concerns in the study; (c) Section 3 was the presentation of the results and findings section where key findings were formulated; and (d) Section 4 provided an outlook for the application to professional practice and implications for social change. Thus, section 4 articulated the findings' interpretation, outcomes' limitations, and recommendations.

Background

Chronic illnesses are significant healthcare disruptions in terms of costs, morbidity, mortality, and overall impact on health quality and peoples' wellbeing. The healthcare system has responded to the growing burden of chronic illness by building more robust capacities to deal with chronic illness. One such response involves capacity building through proper financing. Desmedt et al. (2018) defined chronic conditions as psychosocial or physical problems that exist for more than one year and have limitations in regular functioning and the need for continuous treatment and monitoring or evaluation.

In the United States, chronic diseases, such as type 2 diabetes and hypertension, are among the costliest and most prevalent health conditions, where approximately 133 million Americans suffer from at least one chronic disease (Shin, 2019). The Centers for Disease Control and Prevention (CDC) (2020) further reported that at least 90% of the

total $3.8 trillion allocated to the United States healthcare sector is often used to manage people with chronic and mental-related conditions. According to Shin (2019), type 2 diabetes and hypertension are among the most prevalent chronic diseases in the United States. Type 2 diabetes is associated with adverse financial and health implications, including elevated risks of cardiovascular diseases, nerve damage, and kidney disease, leading to high healthcare costs due to frequent hospitalization incidences (Shin, 2019).

Similarly, Jackson et al. (2018) held that the prevalence of hypertension and type 2 diabetes in the United States remains high, with at least 33% and 12.4% of the adult population being affected. Furthermore, the indirect and direct costs of managing and treating chronic diseases, such as hypertension and type 2 diabetes, were over $316.6 billion and $245.2 billion. Therefore, there is a need to develop more effective strategies for ensuring improved quality of care for people suffering from these diseases.

In response to the increase in hypertension cases and type 2 diabetes cases, among other chronic diseases in the most deprived and medically vulnerable communities, the Health Resources and Services Administration (HRSA) developed and funds Federally Qualified Health Centers (FQHCs) for the service provision of health care to medically deprived or underserved (Desmedt et al., 2018). FQHCs serve approximately 25 million chronic disease patients, with at least 40% covered by Medicaid (Shin, 2019). The development of the Federal Qualified Health Center Prospective Payment System (FQHC PPS) by Congress in 2014 led to the redefinition of Medicaid and Medicare

reimbursements considering a predetermined and fixed amount, leading to the variation in the amount of care costs allocated for patients (Jackson et al., 2018).

Such developments have led to the need to conduct a research study to assess the possible relationship between the increasing number of type 2 diabetes patients, the increasing number of hypertension patients, and the allocation of federal grant funds to FQHCs. The federal grant funds are intended to subsidize patients' healthcare costs for FQHCs and ensure they can access quality medical treatment. Analyzing the relationships between the number of type 2 diabetes and hypertension patients and federal grant funds allocated; reveals whether the government supports the rising number of chronically ill patients to access healthcare or whether there is a need to readdress and increase either grants funds awarded to FQHCs or increase the reimbursement rates of the FQHC PPS.

Problem Statement

The problem that this study focused on addressing was limited resources for managing type 2 diabetes and hypertension. Existing statistics reveal an increasing trend in the number of diabetes cases in the United States, with 34.1 million people living with diabetes in 2018 compared to only 11 million in 2000 (CDC, 2020). The net effect has been increased demand for care services to manage diabetes and hypertension issues. According to Shrivastav et al. (2018), primary care providers (PCPs) are currently providing care services to approximately 90% of diabetic patients, and the proportion is expected to rise in the future, growing the number of diabetic patients in the United States.

The development of FQHC PPS by Congress in 2014 led to a fixed reimbursement payment to FQHCs for patients regardless of their diagnosis and health needs. One of the primary roles of the FQHC PPS is to cover the estimated actual cost of services and operations (Young et al., 2019). Based on the 2019 data, FQHCs accrued a cost of $1044.40 per patient, a 17% increase from the 2016 amount of $889.95 per patient. On the contrary, overall payment rates of FQHC PPS have only increased by 5.7% between 2016 and 2019 (Young et al., 2019). FQHCs must pay for the remaining costs with their grant funds to ensure continued service delivery. Still, such a decision means that funding would be decreased for the other services within FQHCs especially care services needed by uninsured patients and operations (Young et al., 2019).

In addition, existing studies have shown several operational challenges experienced in FQHCs. These challenges include unfilled job openings for social service providers and mental health professionals, inadequate coordination of patient care programs with community social services, and inability to provide affordable care to patients (Lewis et al., 2019). The highlighted challenges are administrative since inadequate staffing in FQHCs leads to patients not receiving adequate supportive care related to mental health and social services.

Similarly, Norwood et al. (2017), in the SWOT analysis of FQHCs, reported that the health system does not encourage comprehensive coordinated care and instead incentivizes procedure-driven care. As a result, there is a challenge of aligning operations

and financial systems to ensure the care provided is patient-centered to facilitate faster recovery as well as higher levels of satisfaction among patients.

Moreover, the administrative challenges faced by FQHCs relate to referral programs it outsources from community healthcare providers to meet the needs of patients who cannot access FQHCs services (Maxey et al. 2015). To put the issue into context, Jones et al. (2013) indicated that for dental care, only 20% of patients in the FQHCs system directly accessed services at FQHCs facilities, and the rest relied on referral programs. However, such referral programs are often undermined by inconsistent reimbursement of community health providers, leading to referred patients failing to access the needed care (Maxey et al. 2015). In this regard, understanding how to improve FQHC administrative operations can help to understand how patients with chronic conditions such as hypertension and diabetes can be effectively supported.

Purpose of the Study

The primary purpose of this quantitative study was to determine the relationship between grant fund allocations and the number of patients with hypertension and type 2 diabetes seen at FQHCs. The research sought to understand whether there is a need to increase grant funds allocated to FQHCs to care for patients with hypertension and type 2 diabetes or whether the fixed amount from the FQHC PPS should be increased to cover these costs. Moreover, the study explored the relationship between grant funds allocated to patient demographics such as ethnicity, race, age, and gender. The underlying goal was to understand whether there are allocation disparities for grant funds intended to improve

healthcare access among patients. Therefore, the results from this study could be helpful to policymakers within the U.S health sector to formulate critical strategies for ensuring the effective disbursement of financial resources to FQHCs for managing patients suffering from type 2 diabetes and hypertension.

Research Questions and Hypotheses

The study was based on four research questions and associated hypothesis:

RQ1: What correlation exists between the number of patients with type 2 diabetes seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$1 There is no statistically significant association between the number of patients with type 2 diabetes seen at FQHCs and the allocation of grant funds.

*Ha*1: There is a statistically significant association between the numbers of patients with type 2 diabetes seen at FQHCs allocation of federal grant funds

RQ2: What correlation exists between the number of patients with hypertension seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$2*:* There is no statistically significant association between the number of patients with hypertension seen at FQHCs and the allocation of grant funds.

H_a2: There is a statistically significant association between the number of patients with hypertension seen at FQHCs and the allocation of grant funds.

RQ3: What correlation exists between patient demographic characteristics (gender, age, race, and ethnicity) and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$3: There is no statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

H_a3*:* There is a statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

RQ4: What correlation exists between the Federally Qualified Health Center Prospective Payment System and cost per patient?

$H_0$4: There is no statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

H_a4*:* There is a statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

Conceptual Framework

The present study used the transaction cost economics (TCE) framework to explain the effects of limited financial resource allocations for FQHCs. According to Jackson et al. (2018) and Young (2018), the TCE theory expresses that the optimum structure in the organizational context is among the significant factors which influence the realization of economic efficiency through the minimization of exchange costs. TCE is an optional approach to organizing and planning transactions. TCE involves

establishing structures such as firms and bureaus whose functional role involves minimizing transaction costs while optimizing outcomes.

TCE, therefore, focuses on organizational structures geared toward achieving economic efficiencies by reducing the expenses on exchange. Thus, TCE theory concentrates on a transaction that allows the implementation of cost management approaches such as monitoring and controlling costs (Young, 2018). Similarly, Desmedt et al. (2018) noted that the TCE theory assumes that each type of transaction produces coordination costs of monitoring, controlling, and managing transactions. Williamson's (1979) transaction cost economics theory shows the transactions of the governing structure and the coordination cost. Further, TCE presents a conceptualized system that allows healthcare transaction analysis and quantification of its effect on healthcare structure, operations processes, and outcomes (Stiles et al., 2001).

The present study acknowledged that the healthcare system comprises complex transaction protocols among patients, care providers, including other care stakeholders. Such transactions often occur in markets, systems, and the organization. Jackson et al. (2018) held that transactions in the healthcare system help produce care and coordinate care activities.

Since coordinating such transactions is integral to care delivery, they must be executed smoothly and efficiently (Shin, 2019). Therefore, the present study used TCE to analyze healthcare transactions (grant funds awarded) to FQHCs and quantified their effects on the quality of care provided to diabetic and hypertension patients who visited

such centers for healthcare services. Through TCE, the management of FQHCs was provided with the relevant knowledge required for decision-making processes, such as how to use limited grant funds awarded to FQHCs for the management and treatment of patients with type 2 diabetes and hypertension.

Wagner (1998) suggests that Chronic Care Model (CCM) may improve self-efficacy, create healthier populations, and reduce healthcare costs. However, according to Potter & Wilson (2017), incorporating TCE and CCM was vital. It helped develop a framework that described the relationship between the allocation of grant funds and the number of hypertension and type 2 diabetes patients seen at FQHCs, which served as the primary assessment of the present study.

Nature of the Study

The present study adopted a quantitative research approach involving collecting and analyzing secondary data from HRSA. However, the data from this source has some setbacks in the usage as only the comprehensive national and state participant data performance measures are publicly available. For this study, only data about FQHCs concerning type 2 diabetes and hypertension management was collected for analysis and interpretation.

The selection of a quantitative research approach was suitable for the study. It facilitated the analysis of large volumes of data from FQHCs about the number of diabetes and hypertension patients and the allocation of grant funds awarded to manage and treat such chronic diseases. As held by Creswell and Creswell (2018), results from

quantitative techniques can be easily replicated, supporting or discarding hypotheses over large audiences. However, Coolican (2018) criticized the efficiency of quantitative research based on its inability to collect and analyze data describing the participants' emotions, reactions, and perceptions about the research problem. Despite the criticisms, this study adopted a quantitative research approach to collect and analyze data from a large study population. This goal could not have been achieved using a qualitative methodology.

Quantitative research was preferred over qualitative because of the large data volumes collected from archived sources, i.e., all the FQHCs caring for type 2 diabetes and hypertension patients in the United States. Specifically, this study used a correlational approach to assess the impacts of the increasing number of type 2 diabetics and hypertension patients seen at FQHCs and the allocation of grant funds. This study also used a correlational approach to assess the relationship between FQHC PPS and cost per patient. Correlational research design assesses the relationship between two or more variables without controlling any of them, intending to discover whether there is a correlation that exists or not (Coolican, 2018; Creswell & Creswell, 2018). The study evaluated the connection across three predictor variables and one criterion variable.

Literature Search Strategy and Literature Review

The literature reviewed in this project was searched and selected from databases such as EBSCO, Sage Journals, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and PubMed. Their high reputations influenced the selection of

these databases for hosting up-to-date and high-quality literature and research evidence about type 2 diabetes and hypertension incidences, management, and treatment in the United States. During the literature search process, keywords such as chronic diseases, type 2 diabetes, hypertension, Federally Qualified Health Centers OR FQHCs, Federal Qualified Health Center Prospective Payment System OR FQHC PPS, Medicare, Medicaid. The literature search process was achieved by using Boolean operators such as "AND" and "OR" and the truncation symbol "*." Consistent with Gunawan (2015), the asterisk "*" symbol is often used in the literature search process as a placeholder for any wildcard or known terms, allowing the identification of studies with alternative terms to the keywords used during the search process. For example, inputting the keyword hypertension* led to identifying studies that use high blood pressure. The literature search process was further limited to data and language of publishing, 2015-2021 and English language, respectively. The literature must only include type 2 diabetes and hypertension patients from the United States. as the study population.

Understanding of Federally Qualified Health Centers

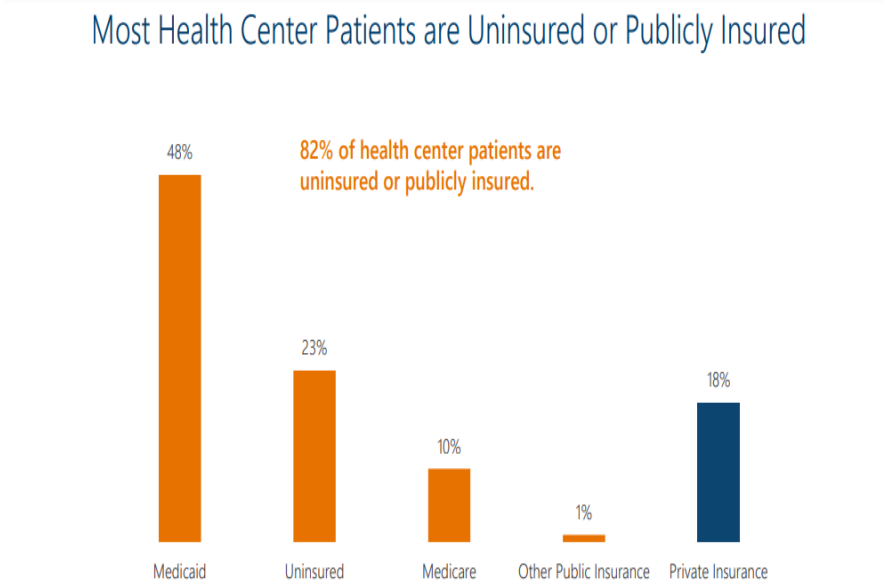
Federally Qualified Health Centers domiciled in the U.S are non-profit clinical providers. They operate under federal standards. FQHCs were initiated due to the need to provide underserved medical care and reduce patient overcrowding in hospital emergency departments. The figures illustrate how health centers in the U.S service socially disadvantaged populations. According to the National Association of Community Health Centers (NACHC), most patients receiving services from health centers such as FQHCs

are uninsured or publicly insured, as shown in the bar presentation. For instance, 48 % of the population is publicly insured by Medicaid, Medicare 10 %, while 23 % remains insured (NACHC, 2021). From this data, about 80 % of the population comprises people who are publicly insured or not insured. It implies that health centers such as FQHCs have greater responsibilities in meeting the needs of this population.

Figure 1 shows how critical health centers deliver healthcare to less privileged or underserved communities (NACHC, 2021). Community health centers such as FQHCs are crucial in the U.S health care system. They were launched in 1965 to create comprehensive primary care systems amongst medically underserved rural and urban communities. Health centers, especially FQHCs, have grown in terms of effectiveness in enhancing accessibility to health care and rehabilitating the quality of health care among communities.

Figure 1

Most FQHCs Cover Publicly Insured and Uninsured Communities



Note. Percentage for "Other Public Insurance" includes non-Medicaid CHIP, or coverage where states contract CHIP through private third-party payers and not Medicaid. From "Community Health Center Chartbook," by National Association of Community Health Center (2020). https://www.nachc.org/wp-content/uploads/2020/01/Chartbook-2020-Final.pdf

FQHCs are sources of preventive and primary care amongst low-income individuals and their families within their communities (Wood et al., 2014). To receive federal funding, FQHCs must be within a federally designated medically underserved area (MUA), provide health services to medically underserved populations (MUP),

deliver comprehensive primary care, adjust health charges on a sliding fee schedule based on patient income, and be governed by a community board. FQHCs are mandated to have a board of governance comprising a minimum of 51% of consumers (Wright, 2013). FQHCs are increasingly focused on managing chronic illnesses.

FQHCs are specifically funded by the U.S Department of Health and Human Services Health Resources and Services Administration (HRSA) to provide healthcare services to the vulnerable population. Diabetes control within the limits of A1c <9% and blood pressure within the parameters <140/90 mm Hg has advanced by HRSA as one of the performance indicators of FQHCs in managing chronic diseases (Rodis et al., 2017). The extensive role of FQHCs and funding are critical epicenters of discussion in this paper in the context of the increasing g incidence of people living with diabetes and hypertension.

Role of Medicare and Medicaid in Chronic Disease Management

As increasing healthcare costs continue to draw attention from different stakeholders, the growth rate in Medicare expenditure, which has exceeded the overall United States healthcare system, is of great concern among policymakers (Young et al., 2019). According to McMullen and Katz (2017), an increase in Medicare Part A spending consumes a significant share of federal revenue. McMullen and Katz's findings also indicated that the current projections show that Medicare outlays surpass dedicated revenues by 45% of overall expenditure. The Hospital Insurance Trust Fund is considered a strong solvent until 2022.

The articles suggest that the primary cause of such a trend is the growing number of Medicare beneficiaries who live with multiple chronic diseases. McMullen and Katz further state that chronic diseases have increased over the past ten years. Raghupathi and Raghupathi (2018), an empirical study on chronic diseases, also affirmed that chronic diseases have continually increased. However, according to McMullen and Katz, there has been a minor increase in Medicare and Medicaid funds to help control these diseases in past years. Therefore, the patients have had difficulties controlling the disease due to the funds.

Consistent with Wang et al. (2018), quantitative research on Medicare's New Prospective Payment System on Facility Provision of Peritoneal Dialysis found that about 14% of Medicare beneficiaries live with heart failure and heart-related diseases. They account for approximately 43% of the total Medicare expenditure every year. Similarly, Xu et al. (2018), in the study focusing on an underserved community in connection to the actual stratification of risk method for conducting a primary care management program for chronic disease, noted that around 18% of Medicare beneficiaries are diabetic and their health care needs account for 32% of Medicare spending every year. This illustrates that many patients with chronic diseases depend on funds to control their chronic diseases. Additionally, Medicare Part B covers care management for beneficiaries with chronic conditions (Young et al., 2019).

Nonetheless, a beneficiary is eligible for Medicare Part B coverage of care management if they live with more than one chronic health condition. Another study by

Grembowski et al. (2014) on people with more than one chronic disease condition indicates that 31.5 Americans suffer from multiple chronic diseases. The study adds that these people depend entirely on health funds and Medicare to control these diseases. It shows how Medicare funds are essential for controlling chronic diseases.

Medicaid also undertakes an integral role in the management, including the treatment for people living with chronic diseases, and the same encompasses hypertension and type 2 diabetes in the United States. As reported by McMullen and Katz (2017), approximately 3.5 million Medicaid beneficiaries are living with type 2 diabetes, and more than 16 million with a history of different forms of cardiovascular illnesses. Therefore, a complete absence of Medicaid would make type 2 diabetes and hypertension patients struggle with managing and treating their diseases and expose them to additional risks of developing costly and debilitating health conditions.

Another research by Christopher et al. (2016) focused on care access and chronic illness outcomes amongst publicly insured individuals, specifically Medicaid-insured individuals versus uninsured persons. In the study, after controlling for patient characteristics, the findings showed that Medicaid-insured persons were more likely than uninsured to seek annual outpatient physician visits. Thus, if one is poor and has hypertension but is Medicaid-insured, there is a better chance of seeing the physical and getting improved awareness of the disease and approaches to managing it. In conclusion, the study affirms that Medicaid is vital in facilitating better care and improving patients' health with high blood pressure.

Furthermore, as per the research by Wang et al. (2018), people living with chronic disease always require access to disease management and prevention services, and they may be forced to seek emergency care after losing access to Medicaid as they would be exposed to additional complications, further burdening the health care system. For that matter, establishing FQHC PPS by Congress is among the key strategies focused on containing the costs of the chronically ill subset of Medicaid beneficiaries.

Despite the availability of studies about the role of Medicare and Medicaid in chronic disease management, there is still limited knowledge concerning the impacts of increasing type 2 diabetes and hypertension patients on the cost accrued per patient within the FQHCs. Therefore, this essential literature gap justifies the need to carry out this study to develop new knowledge and expand the existing information.

Patient Experiences with Clinical Services at the Federally Qualified Health Centers

Federally Qualified Health Centers are established with the core objective of optimizing care experiences amongst medically underserved populations. People's spectrum of chronic illnesses such as diabetes, hypertension, and associated comorbidities are amongst high-risk populations that primary healthcare aspects of Federally Qualified Health Centers should focus on. Suitable monitoring related to chronic diseases, such as accurate administering of medications, can culminate in improved disease control, reduced complications, and improved overall health outcomes. Federally Qualified Health Centers are potential epicenters of creating a positive patient

experience. According to Shin et al. (2020), positive patient healthcare encounters or experiences have been associated with improved health outcomes.

Federally Qualified Health Centers provide a framework through which integrated care is provided. The integrated model of care provides improved patient experiences in terms of increased satisfaction. FQHCs enable the implementation of a collaborative model of care tween healthcare providers and patients. According to Petts et al. (2021), providers and patients are likely to report high satisfaction with the clinic in terms of increased participation in healthcare decisions, recommendation of the clinic to others, and enhanced cost savings.

While satisfaction is evident in integrated care, Petts et al. (2021) found it outstanding in this study's finding where satisfaction levels captured in urban areas served FQHCs providing comprehensive and integrated services appear to provide the highest level of satisfaction. Petts et al. (2021) observed improved patients' experience in terms of general happiness about the care they received and voiced benefits associated with integration and the care within the clinic. However, there were also some negative such as problems within the clinic, such as difficulties experienced in the outside referral process, and infrastructural challenges, such as staff turnover (Petts et al., 2021).

Further, another negative experience reported involved poorer satisfaction levels witnessed amongst Black patients compared to other ethnic groups such as Hispanics and whites. The reports of lower satisfaction levels among patients from African American ethnic communities may be linked to encounters with racism and discrimination, existing

mistrust of the healthcare system among Black American communities, and poor patient-provider relationships. Through the improvement of patient satisfaction and experience, there is an enhanced likelihood of enhancing patient outcomes. By proactively collecting patients' data on their experience in FQHCs, there is an enhanced opportunity to apply such information to better the perception of the quality of care received by the patients, to enhance health providers' communication and performance, and to initiate changes change geared at enhancing the efficiency of the systems and operational. Positive patient experience should be beneficial and linked to evidential improvement in health outcomes, such as notable positive changes in blood pressure and sugar control assessment parameters.

Positive patient experience should go beyond feelings, happiness, and satisfaction to more measurable and observe results such as reduced disease severity. Patients who are satisfied and happy with their experience can be associated with healthier lifestyles and improved wellbeing with better outcomes secondary to proper disease prevention and management. Chronic disease management show improved outcomes when patients are satisfied due to increased collaborations between these patients and their providers (Bookey-Bassett et al., 2017). Financial practices have far-reaching implications on patient experiences in FQHCs. The amount of funding that is channeled into FQHCs impacts the nature of patient experiences.

Adequate findings would mean that there is increased capacity building by improving various systems, such as human resources and diagnostic and treatment

capacity, that are all geared towards improving health outcomes and overall patient experiences. The funding of FQHCs has high relevance to the management of chronic illnesses such as diabetes and hypertension. The extent of investment in terms of financial inflow in FQHCs helps determine the patients' experience in aspects of feelings, perceptions, wellbeing, satisfaction levels, and overall health outcomes.

Role of FQHCs in Improving Chronic Disease Outcomes

The FQHCs are involved in the provision of health care services to the medically underserved population, with diabetes control and blood pressure control of <9% and <140/90 mmHg, respectively, have been incorporated into the Core Clinical Measures being implemented by the HRSA (Bryce et al., 2017; Dobbins et al., 2018). Correspondingly, Ingram et al. (2017) and Oung et al. (2017) noted that FQHCs are also involved in the population management of diabetes and hypertension to facilitate the realization of these goals. Consistent with the outcomes from the studies by Chavez et al. (2018) and Ingram et al. (2017), both HRSA and FQHCs are actively involved in managing diabetes and hypertension through different strategies. These strategies include ensuring the proper use of medications, which leads to improved disease control, management of disease-related complications, and improving the overall health status of the patients.

There is a significant level of evidence that illustrates gaps in efforts in fighting hypertension and diabetes. According to Agency for Healthcare Research and Quality (AHRQ) (2020), hypertension is high blood pressure affecting about 30 % of adults in the

United States. Hypertension is a critical health concern by it is the primary risk factor for heart failure, stroke, chronic kidney disease, heart attack, and death. However, only approximately 50 % of those with hypertension have it under control when their mean blood pressure measurements are below 140/90 mmHg (AHRQ, 2020). More often, hypertension remains asymptomatic, which accounts for a significant percentage of people having hypertension without knowing it. HRSA has produced programs through healthcare centers such as FQHCs to control blood pressure by delivering care to underserved and vulnerable individuals and families. In 2018 alone, healthcare centers provided primary healthcare services to a population exceeding 28 million patients (AH, 2020). The healthcare centers, including FQHCs, are required to report hypertension control performance through the Uniform Data System (UDS) annually. Below is the annual performance of hypertension control as per the data derived from the Uniform Data System (UDS).

Figure 2 shows typical data showing the increasing prevalence of hypertension versus the percentage of controlled cases each year from 2016 to 2018. The findings are collaborated by CDC. According to CDC (2013), about 50% of adults in the U.S have hypertension which culminates in about 116 million people. Under the same CDC data, approximately 91.7 million people are recommended for prescription hypertension medication and lifestyle modifications**,** and a substantial portion of the affected population has their medication dosage increased to strengthen control. However, it is estimated that 24% of adults with hypertension have managed to get their condition under

control (CDC, 2021). The result implies that awareness should be created to promote hypertension management among patients.

Figure 2

Healthcare Centers Hypertension Control Performances for Six Years

Table 1. Health center patients with controlled hypertension control (140/90 mmHg), by race and ethnicity, 2016-2018

	2016	2016	2017	2017	2018	2018
Race	**Total Hypertensive Patients**	**% With Controlled Hypertension**	**Total Hypertensive Patients**	**% With Controlled Hypertension**	**Total Hypertensive Patients**	**% With Controlled Hypertension**
Asian	140,353	67.27%	154,403	67.66%	167,242	67.68%
White	2,273,584	64.76%	2,464,154	65.34%	2,616,804	65.89%
Hispanic	665,561	64.80%	721,205	65.22%	781,565	65.68%
Non-Hispanic	1,608,023	64.76%	1,742,949	65.39%	1,835,239	66.09%
Multiple Race	68,145	66.33%	74,983	63.28%	79,253	64.69%
African American/Black	1,000,384	56.00%	1,068,643	55.74%	1,107,260	59.09%
Hispanic	30,428	60.50%	29,491	62.34%	31,020	62.74%
Non-Hispanic	969,956	55.98%	1,039,152	55.53%	1,076,240	55.44%
American Indian/ Alaska Native	40,626	60.23%	43,133	60.92%	45,689	62.50%
Other Pacific Islander	20,843	62.03%	24,413	60.05%	25,272	62.16%
Native Hawaiian	7,154	58.41%	7,881	59.27%	8,211	59.94%
	2016	**2016**	**2017**	**2017**	**2018**	**2018**
Ethnicity	**Total Hypertensive Patients**	**% With Controlled Hypertension**	**Total Hypertensive Patients**	**% With Controlled Hypertension**	**Total Hypertensive Patients**	**% With Controlled Hypertension**
Hispanic	1,004,225	64.85%	1,087,099	64.96%	1,179,659	65.59%
Non-Hispanic	2,849,772	61.66%	3,083,507	61.94%	3,237,091	62.47%
Total	**3,920,129**	**62.39%**	**4,240,467**	**62.71%**	**4,497,046**	**63.26%**

Note: Measure is the percentage of patients ages 18-85 years who had a diagnosis of hypertension and whose blood pressure was adequately controlled (below 140/90 mmHg) during the measurement period. From "AHRQ Data Spotlight: Hypertension Control in Health Resources and Services Administration Health Centers" by Agency for Healthcare Research and Quality (2019).

www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/dataspotlight-hypertension.pdf

Dobbins et al. (2018), Ingram et al. (2017), and Oung et al. (2017) supported the use of a medication therapy management approach for delivering care services to chronically ill patients in the FQHCs because it provides a comprehensive medication review for ensuring improved patient satisfaction and outcomes by meeting all their care needs. After ending the FQHC visit, the care practitioners would then use the medication therapy management tool to develop a care plan. The care plan is later shared with the patients and the primary care providers as a strategy for limiting and preventing the occurrence of any form of drug therapy problem through the elimination of unnecessary medications, initiation of appropriate medications, adjustment of dosage regimens, addressing possible adverse reactions in addition to increasing the willingness of the patients and their ability to properly adhere to the newly developed medication regimen (Dobbins et al., 2018; Oung et al., 2017).

Even though these studies have emphasized the significant role of pharmacists in chronic disease management, these care providers are often missing, and underutilized members of the health care teams within the FQHCs hence limiting the successful implementation of medication therapy management approach in these centers leading to low patient satisfaction and negative experience with the care services.

The FQHCs as Value-Based Payment Transformation Channel

The need to develop a value-based care approach in the United States has been reported to increase in recent years owing to the growing number of chronically ill

patients and limited resources to cater to their healthcare wants and expectations (Goff et al., 2021; Izguttinov et al., 2020). Lipson et al. (2019) and Olson et al. (2021) described value-based care as a model developed to facilitate proper alignment of the care system, the patient, care providers, and the community to realize improved health outcomes at a lower cost. Successfully designed value-based care models should be prevention-focused, risk-based, patient-centered, and minimally invasive to ensure equitable distribution of care resources (Goff et al., 2021; Niazi et al., 2021). During the treatment process of Medicaid and Medicare populations, most of the FQHCs are financed based on the PPS involving a cumulative rate for each legible patient visit paying for the insured health services offered during the visiting time (Lipson et al., 2019; Niazi et al., 2021).

Specifically, Congress developed the PPS to avert the FQHCs from using their Federal Section 330 grant funds, which are allocated for use in the provision of care services to the uninsured as well as for subsidizing care services for Medicaid patients (Goff et al., 2021). Consistently, Olson et al. (2021) noted that the PPS provides sustainable financial support to the health center program and provides the state Medicaid programs with the opportunity to use alternative payment models.

Within such an approach, the payment amount in the alternative payment models cannot be less than the amount the FQHCs are entitled to receive through the traditional PPS calculations. The centers have the right to content the utilization of an alternative payment model (Izguttinov et al., 2020). Therefore, this requirement helps create a conducive atmosphere for dialogue among stakeholders in the United States health sector

and enhances the quality of collaboration between the payer and provider during the establishment of alternative payment models. Nonetheless, there is still limited evidence showing the role of FQHCs in the promotion of a value-based care model within the context of diabetes and hypertension patients as chronically ill individuals.

Within a value-based patient model, care providers are only compensated for caring for populations with incentives for demonstrating value through the prevention of chronic diseases and prioritizing health outcomes of the patients instead of relying on a payment model which emphasizes the volume of services provided (Goff et al., 2021; Izguttinov et al., 2020; Niazi et al., 2021). The PPS model used in the FQHCs compensation has been acknowledged by different health scholars such as Lipson et al. (2019); Mac-Mccullough et al. (2019); and Smith et al. (2018) for its ability to promote steady revenue flow for the patient base even in situations where there are variations in care pathways influenced by risk status or distribution to practice operations.

Furthermore, value-based care has been established by Mac-Mccullough et al. (2019) and Smith et al. (2018) to play a vital role in encouraging and rewarding interprofessional practice as well as keeping track of the patient expectations outcomes and satisfaction with the care services provided within the FQHCs. However, most of the available studies about the role of FQHCs in enhancing value-based care have focused on other healthcare problems, such as dental issues and mental health problems, with little focus on type 2 diabetes and hypertension, although these are two important chronic diseases affecting most of the United States population. Therefore, this is an essential gap

in the literature that the present study focused on addressing through the creation of new knowledge about the role of FQHC-PPS in promoting value-based care services among type 2 diabetes and hypertension patients.

Quality of Care FQHCs Compared to Other Primary Care Settings

A primary objective of the ACA is to ensure the widening of the Medicaid program to incorporate adults below the age of 65 years with incomes stretching to 133% of the federal poverty level (Nocon et al., 2016). Almost 50% of the states in the United States have formalized the expansion of their Medicaid programs, accompanied by increasing enrollment following a broadened public awareness and improved enrollment process (Goldman et al., 2016). Nonetheless, the expansion of Medicaid services has raised a lot of concerns regarding the monetary sustainability of the program, in addition to the accessible healthcare professionals to care for individuals that are newly insured individuals. A significant number of studies have assessed the rate of care use and spending for Medicaid enrollees within the FQHCs compared to the primary care settings. For example, the analysis by Kurtzman and Barnow (2017) revealed that the fee-for-service Medicaid adult enrollees from the 13 states who received their primary care in the FQHCs had lower total healthcare use and spending compared to their cohorts who received similar care from other settings.

Specifically, the general consistency of the outcomes reported in this study suggests the existence of a distinct correlation between health care use and spending and the primary care settings, which was influenced by the independent administration of

Medicaid programs by the included state, with variation in management, financing, and care programs. On the contrary, Lindner et al. (2019) and Nocon et al. (2016) established that some states registered improved quality of care among patients cared for in the primary care settings than in the FQHCs. For example, Nocon et al. (2016) reported that Texas, Connecticut, and Illinois had primary care spending and used while Illinois alone registered the highest emergency department use among non-health center patients. However, these studies failed to outline and explain the specific factors that have led to such inconsistencies.

Furthermore, Falik et al. (2016) and Kurtzman and Barnow (2017) compared the various types related to non-health center settings of primary care, including the outpatient care settings and physician offices, and reported similar outcomes as in the study by Rothkopf et al. (2018), except that the Medicaid enrollees treated had higher primary care spending and emergency department use and spending compared to their cohorts in the physician office. Therefore, the development of these outcomes can be associated with the assumption that the FQHCs often provide higher levels of care and lower spending, making them an efficient form of primary care.

Moreover, the studies by Lindner et al. (2019) and Rothkopf et al. (2018) specifically collected their data from the Medical Expenditure Panel and Medicare claims, respectively, and reported that the existence of lower overall health care use, including spending for patients treated in the FQHCs compared to their colleagues cared for in other primary care settings. In relation to the quality of care provided in the

FQHCs, Falik et al. (2016), Kurtzman and Barnow (2017), and Nocon et al. (2016) established that the measures that are process-based for quality have a comparison or reported to be higher among these centers when related patient populations are treated. From these results, it can be noted that chronically ill patients are likely to register a similar level of satisfaction and general outcomes when treated in the FQHCs, irrespective of the location of such centers. However, these outcomes have been contradicted by the results from Gurewich et al. (2016) and Richards et al. (2017), which revealed that the quality-of-care services, including outcomes of a patient in FQHCs, often vary from state to state depending on the care delivery models that they have adopted. In the studies by Gurewich et al. (2016), Lindner et al. (2019), and Rothkopf et al. (2018), which used ecologic designs, it was reported that expansion of FQHCs is a fundamental approach for reducing mortality rates in an area owing to the improved quality of care provided in such centers.

However, the efficiency of FQHCs has been criticized by different health scholars on the ground that some of these centers often focus on serving a large number of patients to increase their net revenues without putting more attention on patient outcomes, leading to high readmission and mortality rates (Falik et al., 2016; Goldman et al., 2016). Therefore, this is considered a fundamental matter that requires extensive exploration to understand the precise impacts of care services within the FQHCs on patient outcomes and consistency with their spending process.

Furthermore, more recent high-profile studies on Medicaid have reported many controversies about the program's spending efficiency. For example, Nocon et al. (2016) and Richards et al. (2017) reported that the states considering expanding their Medicaid programs are often engaged in discussing the most appropriate approaches for managing the health care spending for insured patients. Furthermore, these outcomes can be interpreted using the arguments by Goldman et al. (2016) and Kurtzman and Barnow (2017) that the sequence of utilization, not to mention cost, often depicts the characteristics related to the FQHCs based on the outcomes registered by cared patients, compared to the aspects of care within the health center. Therefore, it is justifiable to note that if FQHCs decide on the referral of patients to other care facilities with reduced charges or minimal spending due to accessibility and patterns of practice, then the scope of referral networks would influence the development of disparities and spending.

Utilization of Hospital Services Medicaid Patients in FQHCs Compared to Private Care Providers

There are numerous health benefits of comprehensive primary care. Specifically, Gao et al. (2017) and Wright et al. (2015) noted that access to primary care helps in reducing health disparities across the population, including those from minority groups and people with lower socioeconomic status. Previous studies involving Medicaid clients have established that the patient's use of FQHCs is widely associated with reduced cost of care, less use of acute care services as well as fewer cases of preventable hospitalizations in comparison to their cohorts who use other primary care centers (Chen et al., 2015;

Jiang et al., 2016; Lavelle et al., 2018). Occasionally, preventable hospital admission and readmission cases are necessary measures for assessing the quality of care offered to Medicaid patients in the FQHCs (Capp et al., 2017; Xing et al., 2015). Therefore, community health centers with more comprehensive care services would influence the prevention of more expensive hospital care.

Furthermore, the efficiency of FQHCs in providing comprehensive health services when caring for Medicaid patients has been extensively compared to the quality of services offered by the fee-for-service providers (Chang et al., 2016; Wright et al., 2015). However, these studies have reported contradicting outcomes, with some establishing that the FQHCs have more comprehensive and effective care services (Cummings et al., 2014; Lavelle et al., 2018). In contrast, others state that fee-for-service providers often offer higher quality care (Chen et al., 2015; Xing et al., 2015), while Capp et al. (2017) and Jiang et al. (2016) noted that there is no significant difference between the quality of care extended to Medicaid patients within the two groups of primary care settings.

Despite the availability of vast studies that have compared the efficiency of care within these two categories of primary care settings, the generated outcomes are not conclusive enough to be used for developing more effective and appropriate policies for enhancing the delivery of quality care to the Medicaid patients irrespective of their preferred health centers. Owing to the increasing number of Medicaid clients in all the states of the United States who are using the FQHCs to access services for primary care,

the growing role of these community-based health centers is projected to facilitate the effective implementation of the ACA.

Previous research, for example, Chang et al. (2016), Jiang et al. (2016) and Lavelle et al. (2018), and Wright et al. (2015), have reported that the FQHCs users are less likely to have Accident and Emergency department visits, avoidable hospital admissions, and inpatient hospitalization compared to the other Medicaid enrollees. Furthermore, Capp et al. (2017) and Gao et al. (2017) established that unadjusted outcome often showed greater rates of use among patients of FQHCs owing to their demographic characteristics. However, these studies have failed to precisely outline how the patient demographics influenced the quality-of-care services offered to FQHCs patients, although all the Medicaid patients within the community centers are expected to receive high-quality care and register positive outcomes and satisfaction.

Nonetheless, Johnson et al. (2018) controlled the patient demographic characteristics, such as age and the presence of disability, hence registering outcomes that are contrary to those presented in Chang et al. (2016), Jiang et al. (2016), and Wright et al. (2015). Therefore, the findings from Johnson et al. (2018) show that receiving routine care from the FQHCs often decreases the chances of the patient receiving additional care at more expensive costs from other healthcare settings. Similarly, Gao et al. (2017) reported that the Medicaid enrollees receiving their usual care from the FQHCs registered reduced rates of preventable hospital admissions in addition to lower rates of admission

for acute conditions. These outcomes correspond with those registered in the study by Johnson et al. (2018).

Cummings et al. (2014) and Johnson et al. (2018) suggest disparities between patient outcomes in FQHCs and other health centers. The leading cause of this is significant differences in demographics, as most community patients are considered healthier and are made up of women, children, and a small percentage of the disabled. However, Gao et al. (2017) and Jiang et al. (2016) further argued that such disparities in the patients' demographic factors do not mean that the better outcomes of Medicaid clients whose regular care comes from the FQHCs are not associated with that source of care. Consequently, it is not appropriate to conclude that all the FQHCs patients often register greater satisfaction and more positive outcomes compared to their colleagues in private care centers or other healthcare centers. Therefore, future research in this context should include patients from FQHCs and other health centers with similar demographic characteristics to determine whether the quality-of-care services in the community health centers are higher than those offered in other health centers by the private care providers.

Regarding the outcomes from the studies by Gao et al. (2017) and Xing et al. (2015), it can be noted that patient demographic characteristics such as gender and urbanicity do not have greater impacts on the health outcomes among Medicaid clients in the FQHCs. Therefore, these outcomes are consistent with those reported in the studies by Chang et al. (2016), Cummings et al. (2014), and Lavelle et al. (2018), leading to the development of a conclusive remark that the routine care services provided to the

Medicaid clients within the FQHCs often lower their chances of receiving additional and more expensive care from other hospital settings. However, none of the research specified the type of diseases or care needs that Medicaid clients were seeking to address within the FQHCs, limiting the generalizability of the generated outcomes to a particular group of patients, including those with chronic diseases such as diabetes and hypertension. Public health insurance entities, including Medicaid, State Children's Health Insurance Programs, publicly funded clinics, and health centers such as FQHCs, all have a common goal of ensuring the provision of high-quality care at an affordable cost (Cummings et al., 2014; Lavelle et al., 2018). However, concerns have been raised regarding the increasing cases of these entities preferring the provision of quantity care over quality care to eligible patients to earn more financial incomes from the federal health fund programs.

Impact of Funding of FQHCs

For the study, it was critical to examine the influence of funding on diabetic and hypertensive patients served in FQHCs. More often, health centers that are federally qualified receive federal funding. Thus, such funding is geared towards serving medically underserved populations and providing a spectrum of services such as comprehensive primary care, facilitative services, and behavioral health care. According to Myong et al. (2021), increased funding for FQHCs is believed to expand the local capacity of care that is clinic-based at the same time and support the reduction of expensive resource use, including emergency department visits (ED). These findings are collaborated by Penson,

D. F. (2017), who pointed out the significant increase in the quality of care overall due to the development of a more robust system secondary to the integration of the Affordable Care Act (ACA). Besides observations by Cole et al. (2021) and Myong et al. (2021), findings showed that Medicaid expansion-state FQHCs led to improved blood pressure and glucose control measures over five years amongst Black and Hispanic patients compared with FQHCs in non-expansion states. In states that expanded Medicaid, the number of adults who utilized FQHCs services and were not insured declined after expansion, with the most significant declines happening during the initial expansion year but with gradual declines during the second expansion year, and no more significant statistical change in terms of uninsured rates in year three to five of expansion (Cole et al., 2021). Furthermore, expansion is linked to sustained reductions in uninsured incidence at FQHCs. Assessing the changes in hypertension and diabetes control following expanded Medicaid coverage is fundamental because uninsured and underinsured persons with chronic conditions such as diabetes and hypertension often forgo effective treatment, which can expose them to increased cardiovascular risk, mortality, and other complications.

Wright and Nice (2014) had a slightly different and critical view on the financial support of FQHCs. According to Wright and Nice's (2014) findings, none of the measures resulting from public health organizations' support linked to FQHCs anticipated FQHC specific outcomes aligned to the chronic illness. Thus, the authors found inadequate facts on the health support of FQHCs influences on the outcomes of chronic

illness amongst FQHC patients. Support of FQHCs by state public health bodies is a potential approach to adopting primary care, including public health, to better efforts that are geared towards fighting chronic disease. FQHCs mostly serve medically vulnerable populations and are administered by the Federal Bureau of Primary Health Care administrates FQHCs which are federally funded provider. FQHCs are obligated to provide primary care irrespective of their payment capacity by deploying an income-sensitive sliding fee. Despite such obligation, the outcomes of chronic disease management with FQHCs setups have not been satisfactory. Wright and Nice (2014) partly attribute such poor outcomes to various possibilities, such as a sicker population, less compliance to treatment, increased barriers to primary care, and increased capacity-related constraints in FQHCs setups. However, FQHCs still offer high potential in the overall management of chronic illness.

Understanding United States Models of Health Financing, such as Prospective Payment Systems

Medicaid plays a critical role in the industry of health insurance. Thus, policymakers at both federal and state levels are increasingly focusing on payment policies and purchasing approaches to create frameworks that support higher quality, more efficient care. The two most substantial typical supplemental payments include Disproportionate Share Hospital (DSH) Payments and Upper Payment Limit (UPL) payments, where both DSH and UPL payments are representative of over 30 % of Medicaid fee-for-service payments to healthcare providers (Bachrach & Dutton, 2011).

With rising cases of chronic illnesses like in the case of diabetes and hypertension, it is worth noting how funding affects the management of chronic idleness.

The Centers for Medicare and Medicaid Services procured the services from Arbor Research in conducting data analysis and modeling that could facilitate the launching of a prospective payment system for FQHCs) as encapsulated in the Patient Protection and Affordable Care Act of 2010 (Turenne et al.,2018). Since the FQHC programs were initiated in 1992, Medicare payments directed to FQHCs are said to be anchored on all-inclusive rates per visit. The all-inclusive rates per visit encompass all allowable costs linked to a visit, such as offered services, overhead costs, and supplies. Such payment rate before Prospective Payment Systems was upper payment limits (UPL) (Bachrach & Dutton, 2011). The UPL refers to the federal limit set for fee-for-service reimbursement amongst Medicaid healthcare providers, which implies the maximal level a specific State Medicaid program is expected to cumulatively pay a provider (Bachrach & Dutton, 2011). State Medicaid programs are obligated not to claim payments over the relevant UPL. Previously, Medicaid and Medicare payments were based on cost-based payment approaches for facilities across hospitals and nursing, but when Medicare acquired perspective, DRG-based payment for hospitals, programs for State Medicaid got the upper hand in setting upper or maximum limits for its healthcare providers (Bachrach & Dutton, 2011).

DSH and UPL remittances have been applied to subsidize uncompensated costs of care and backfill related to low rates of reimbursement under Medicaid for hospitals

providing care to many Medicaid and uninsured patients. DSH payments compensate hospitals that care for many patients from low-income populations (Sharfstein et al., 2017). Thus, payments such as DSH and UPL payments are a critical source of income for hospitals, mostly safety-net hospitals, but these supplemental payments (DSH and UPL) are often disjointed from the specified care services extended to purposively sampled patients and do not directly relate to the efficient administering or care provision within quality set standards.

UPL differed for FQHCs between rural and urban areas and productivity standards. The rate was annually altered from the perspective of n the Medicare Economic Index (MEI). The enactment of the ACA mandated the initiation of a Medicare PPS for FQHCs, which manifests FQHC's reasonable costs without the UPL and productivity standards. Medicare PPS for FQHCs also demands the PPS consider the type, duration, and intensity of services provided by FQHCs, which explains various adjustments based on geographical regions. Payments within the PPS led to FQHC cost reporting periods which commenced in late 2014 (Turenne et al., 2018).

Federally Qualified Health Centers (FQHCs) in the U.S serve millions of patients, including individuals under Medicaid. Due to the fundamental contribution of the FQHCs, including the value, they provide to Medicaid patients as well as state programs, Congress, in an objective manner, developed a specific protocol for payment called Prospective Payment System (PPS) for health centers. The system of payment is the critical linkage in the case of FQHCs and Medicaid, which further links to the health

centers' continual viability. FQHCs are a unique type of Medicaid provider that offers primary and preventive services; most do not access fee-for-service Medicaid and are obligated to have a location within a medically underserved area. Moreover, they are expected to provide care irrespective of income and insurance status. A prospective Payment System (PPS) was integrated to protect FQHCs and create their capacity to offer care to a vulnerable population.

A Prospective Payment System (PPS) refers to reimbursement methods by which Medicare remittance is undertaken and the such basis on a pre-established amount that is also fixed: The amount of payment for a specific service basis on that service's system of classification such as diagnosis-associated groups for inpatient hospital services. Centers for Medicare and Medicaid Services (CMS) deploy different PPSs for reimbursement to home health agencies, acute inpatient hospitals, hospices, hospital outpatient, inpatient rehabilitation facilities, long-term care hospitals, inpatient psychiatric facilities, and skilled nursing facilities.

Medicare and Medicaid are primarily derived from the Benefits Improvement and Protection Act of 2000 (BIPA) as replacements of the cost-driven reimbursement frameworks for FQHCs with PPS, which services the Federal purposes that FQHCs be reimbursed at a minimum rate in relation to services extended to Medicaid patients (NACHCs Report,2015). Section 10501 of the Patient Protection and Affordable Care Act of 2010 prescribed a reimbursement mechanism for Medicare services in Federally Qualified Health Centers (FQHCs) (CMS, 2020). On October 1, 2014, FQHCs

transitioned to a prospective PPS in which Medicare payment got anchored on a national rate (Lipson et al. 2019). The adjustment of the rate is based on the location of the delivery of services. The rate then rose by 34.16 percent for the newly enrolled patients to FQHCs, Annual Wellness Visit (AWV or an Initial Preventive Physical Exam (IPPE) was furnished (Sheesley, 2017).

For instance, code G0468 in an FQHC visit represents IPPE or AWVA FQHC visit that involves an Initial IPPE or AWV (American Medical Association, 2020). Code G0468 in an FQHC typically reflects per diem to a Medicare beneficiary obtaining an IPPE or AWV, and it encompasses the entire services that would end up being billed as an FQHC visit under code G0466 or code G0467. The IPPE is a preventive visit given to newly enrolled Medicare beneficiaries but does not include a comprehensive or in-depth physical examination. Instead, IPPE concentrates on health promotion and disease prevention and detection.

Medicaid makes payments to health centers under PPS, which matches payments to the costs of providing care. Health centers such as FQHCs are federally recognized types of Medicaid providers. These health centers must meet requirements to receive payments for healthcare delivered under Medicaid programs. Medicaid programs pay health centers such as FQHCs under a unique cost-related payment formula that ensures federal grant funds are used to pay for uninsured or under-insured patients (Rosenbaum et al., 2019). Congress developed FQHC PPS to nurture predictability and stability for health centers.

In 2001, PPS rates were computed for each FQHC based on the past costs pertaining to comprehensive care to Medicaid patients. FQHC PPS is geared towards the promotion of efficiency rather than cost-based reimbursement. FQHCs receive a fixed payment rate for each qualifying patient visit for all covered services and supplies provided during the visit (Schulte, 2018). However, PPS rates are not in line with inflation or changes to the services that FQHCs provide, but more often, PPS covers significant FQHCs' costs of caring for Medicaid patients. The assumption rooted in PPS is that any deviation in cost for a stay in each Diagnosis-Related Group (DRG) is associated with inefficiency.

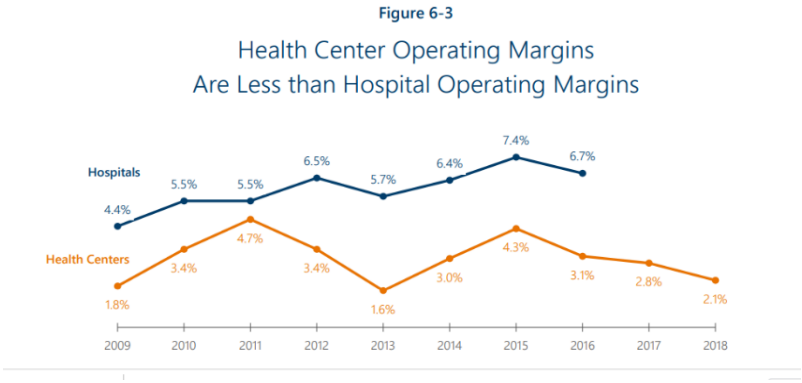
According to Dormont (2014), paying hospitals a fixed price under each stay in each DRG is an impactful incentive for managers to minimize costs, but they risk running operating losses if costs exceed DRG payment rates.PPS may provide a perfect incentive for cost reduction due to fix sum per stay defined regardless of a specified hospital's actual cost. However, questions are raised because the regulator has an informational problem because it does know care costs when the hospital is fully efficient for a given DRG). Shleifer's competition theory undergirds the theoretical foundation for a PPS but has some unrealistic assumptions, such as homogeneity of hospitals, patients having the same similar pathology, and fixed quality of care Dormont, (2014). However, the great diversity in hospitals' care delivery situations, such as the low economic status of the severed population, locality, and severity of care, modulates costs and input prices and high can cause the hospital to operate at a loss for some patients when using PPS. These

observations regarding PPS provide an in-depth introspection into the role of this payment or funding system on hypertension and diabetes. Healthcare centers such as FQHCs operate at lower margins when compared to hospitals, as shown below in the figure derived from NACHC (2021).

Figure (3) shows how hospitals have been operating at higher margins compared to healthcare centers such as FQHCs, as evidenced by data from 2009 to 2018. The low margin in operation in healthcare centers such as FQHCs is equally observed by Ly and Cutler (2018), whose findings show that hospitals had a larger margin, but the not-for-profit provider such as FQHCs status was associated with a decrease in operating margin. Furthermore, according to the study findings, there is no significant relationship between increased hospital profitability and the dynamic of diagnosis, diversity of profitability services, or payer mix, but increased profitability was more associated with increased admissions (Ly & Cutler, 2018).

Figure 3

FQHCs Operating Margins in Comparison to Hospitals.



Note: Operating margin data for hospitals after 2016 are unavaialbe. From “Community Health Center Chartbook,” by National Association of Community Health Center (2020). https://www.nachc.org/wp-content/uploads/2020/01/Chartbook-2020-Final.pdf

Figure (4) shows a gradual increase in funding and costs from 2016 due to expanding population and rising disease incidence. Besides the rising cost, there has been increased prevalence related to chronic illnesses like in the case of diabetes as well as hypertension, which form the center of focus in this paper. The data from HRSA is consistent with the overall outlook of diabetes prevalence. According to data from CDC based on the 2020 National Statistics Report on diabetes, there were about 34.1 million U.S people with diabetes, which translates to about 10 % of the population, and the percentage of adults living with diabetes increased with age, with about 26.8% amongst persons above 65 years.

Figure (4) also shows that federal healthcare funding has been on a continual gradual rise, but with a bit of inconsistency, as evidenced in 2020, where there was a slight drop. For instance, the federal funding for health centers clusters in 2016,2017,2018,2019, and 2020 is shown below, cording to data from HRSA.

Figure 4

Total Federal healthcare spending on healthcare centers, total costs, and total accrued costs per each patient

Cost Data	2016	2017	2018	2019	2020
Total Health Center Cluster	$4,318,331,539	$4,599,152,286	$4,718,365,832	$4,929,883,133	$4,734,433,643
Total Cost	$23,011,860,613	$25,597,401,177	$28,100,675,862	$31,161,368,639	$33,074,410,001
Total Accrued Cost per Patient	$889.85	$941.97	$990.17	$1,044.40	$1,156.82

Note: UDS Data Five-Year Summary Cost Data. From " National Health Center Program Uniform Data System (UDS) Awardee Data" by Health Resources and Services Adminitration (2021). https://data.hrsa.gov/tools/data-reporting/program-data/national

Figure (5) shows the case prevalence of hypertension and diabetes with the proportionate percentage in relation to other conditions.

Figure 5

Number and % of patients with diabetes and hypertension from 2016-2019

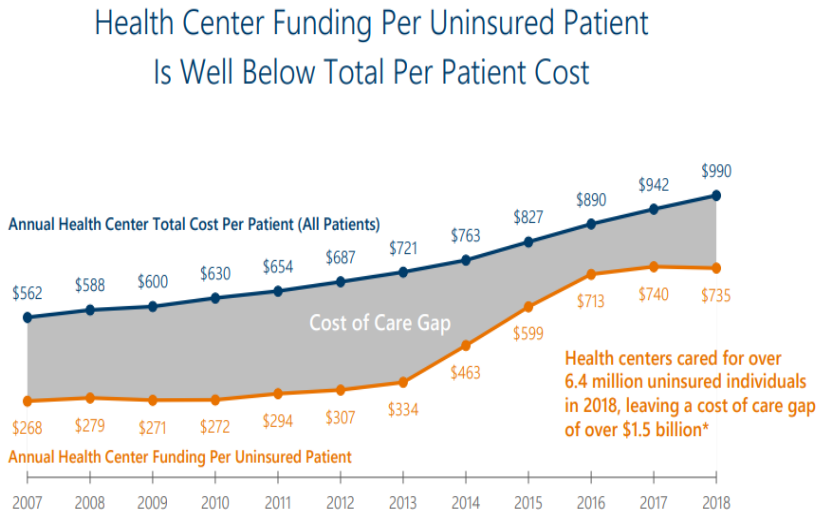
Clinical Data	2016	2017	2018	2019	2020
Patients					
Medical Conditions (% of Patients with Medical Conditions)					
% Hypertension Patients *	26.22 %	27.12 %	27.57 %	28.17 %	28.89 %
Number of Hypertension Patients *	3,920,129	4,240,467	4,497,046	4,820,688	5,079,953
% Diabetes Patients *	14.30 %	14.98 %	15.20 %	15.28 %	14.70 %
Number of Diabetes Patients *	2,071,326	2,266,902	2,395,226	2,521,656	2,492,981

Note: UDS Data Five-Year Summary Clinical Data. Adapted from " National Health Center Program Uniform Data System (UDS) Awardee Data" by Health Resources and Services Adminitration (2021). https://data.hrsa.gov/tools/data-reporting/program-data/national

Figure (6) shows rising costs amongst uninsured patients regarding funding and annual health centers costs per patient. There are cost gaps between the federal spending per patient from 2007 to 2018, as shown in this graphical presentation. It implies that there has been consistent underfunding.

Figure 6

Cost of Care Gap



Note: Calculated by taking the difference btween 2018 health center total ocst oer patient (all patients) and 2018 health center funding per unisured patients, hen multiplying by the

number of health cneter unisureed patietns in 2018. From “Community Health Center Chartbook,” by National Association of Community Health Center (2020). https://www.nachc.org/wp-content/uploads/2020/01/Chartbook-2020-Final.pdf

Definitions

Allocation of grants funds: Refers to the HRSA financial assistance programs that are provided by the federal government to Federally Qualified Health Centers to help provide equitable health care to people who are geographically isolated and economically or medically vulnerable (HRSA, 2021).

Chronic disease: Refers to any health condition which lasts for a year and requires continuous care, negatively impacting activities of regular living of an individual or both (CDC, 2020).

Medicaid: This is a health insurance program targeting United States individuals and low-income families' health coverage.

Medicare: this is a federal health program focusing on people 65 and above years and other people with different disabilities.

FQHC PPS: Refers to a central payment system to the successful relationship between Medicaid and FQHC and health counters' continued viability (Shin, 2019).

FQHC: Payment designation from the Centers for Medicare and Medicaid Services and the Bureau of Primary Health Care of the United States Department of Health and Human Services and plays an imperative role in enhancing the efficiency of

health programs funded under the Health Center Consolidation Act (Desmedt et al., 2018).

Hypertension: Health condition characterized by persistently elevated blood vessel pressure (CDC, 2020).

Type 2 diabetes: Metabolic health condition causing an elevation in blood sugar (CDC, 2020).

Assumptions

Based on the facts presented, the study collected and analyzed secondary quantitative data published in hrsa.data.gov; it was assumed that the original data was collected by experts and of high quality (characterized with minimal errors) hence the quality of outcomes following the analysis process. Consistent with Coolican (2018) and Creswell and Creswell (2018), secondary data might be inaccurate by failing to cover key characteristics of the population that researchers want to examine. The present study further assumed that data presented in hrsa.data.gov contain detailed information about the number of hypertension and type 2 diabetes patients seeking care services from FQHCs and the FQHC PPS reimbursements to those centers.

Furthermore, the present study was developed on the belief that all patients included in the primary data collection process provided accurate information about their health conditions, financial and insurance status, and demographic characteristics, as these factors were used as critical variables during the hypothesis development and testing.

Scope and Delimitations

Both scope and delimitation define the topic and boundaries of the research problem being analyzed (Coolican, 2018). According to Creswell and Creswell (2018), while scope explains how in-depth the study explores the research problem and parameters within which it operates regarding timeframe and population, delimitations are factors and variables that are not included during the investigation. The extensive focus of this study was to assess the impacts of grant fund allocation to FQHCs on the quality of care offered to type 2 diabetes and hypertension patients. The study also assessed FQHC PPS reimbursement rates with cost per patient. The diabetes and hypertension patient population with FQHCs was the scope of this project. Therefore, patients suffering from other chronic diseases apart from diabetes and hypertension were delimited from the study. Furthermore, any data about the perception of health care stakeholders, such as care practitioners, about FQHC PPS's efficiency were not included as the present study primarily collected secondary quantitative data about FQHC PPS reimbursements FQHCs for type 2 diabetes and hypertension treatment and management.

Limitations

The present study collected secondary data from hrsa.data.gov for analysis, hence the possibility of transferring errors made during primary data collection and analysis into this study. Within the hrsa.data.gov database, the researcher specifically collected secondary about the Uniform Data System (UDS) Clinical Quality Measures for 2016, 2017, 2018, 2019, and 2020. Therefore, this study did not include the most recent data

about FQHCs, FQHC PPS, and the number of hypertension and typed 2 diabetes patients. Even though many forms of chronic diseases are prevalent within the United States population, this study only focused on those suffering from type 2 diabetes and hypertension.

The other limitation of the research was that data extracted from the HRSA website was limited, which made it difficult to know how many diabetic patients and hypertension patients were covered by Medicaid, thereby hindering comparison to understand the number of patients who were reimbursed. In this regard, future research should be conducted to examine the correlation between the number of type 2 diabetic patients and hypertension patients who are covered by Medicaid with an FQHC PPS reimbursement.

Significance

Outcomes from the present study helped in understanding the impact of the imbalance between grant fund allocation and the number of type 2 diabetes and hypertension patients seen at FQHCs. It also helped in understanding the relationship between cost per patient and FQHC PPS reimbursement rates. Therefore, evidence generated from this study could be used by healthcare administrators in the decision-making process regarding the number of type 2 diabetes and hypertension patients that their respective FQHCs can care for using grant funds and the reimbursed funds by FQHC PPS. Furthermore, the present study provided healthcare administrators with

detailed information about resources such as time and funds required for managing and treating patients that suffer from type 2 diabetes as well as hypertension.

Summary and Conclusion

The section entailed the introduction of the study topic. It included the research problem, which focused on the issues of chronic diseases. The study established the relationship between increased type 2 diabetes and hypertension in allocating federal funds. The study was justified because there are limited studies on the topic, and at the same time, the number of patients suffering from type 2 diabetes and hypertension continues to increase. The findings from the study were relevant in understanding the need of people suffering from chronic diseases and the funding that they may need to manage their diseases.

The study design was quantitative, which fits the research objectives. Because the research focused on the funding for chronic diseases, patient outcomes, and experiences, and the literature review, which was focused on Medicaid, Medicare, FQHCs, and FQHC PPS, are related to the topic of study as Medicaid and Medicare, which are about funding chronic diseases, while FQHCs and FQHC PPS focus on the payment mode. The early studies relating to the topic were critical for the study to evaluate the findings relating to this study. The same is essential for the current study, as the findings would either support or contrast these studies.

Section 2: Research Design and Data Collection

Introduction

The main purpose of this study was to determine the relationship between grant fund allocation and the number of patients with hypertension and type 2 diabetes seen at FQHCs. The research sought to understand whether there is a need to increase grant funds allocated to FQHCs to care for patients with hypertension and type 2 diabetes or whether the fixed amount from the FQHC PPS should be increased to cover these costs. Moreover, the study explored the relationship between grant funds allocated to patient demographics such as ethnicity, race, age, and gender. The primary purpose of this section was to state and describe the research design and methodology used when undertaking data collection and analysis in the present study. This section also justified the selection of each method identified. Furthermore, this section describes the philosophical principle used for conducting the study, the research design, its rationale, and an explanation of the data collection and analysis processes. Population, sample size, threats to validity, and strategies for limiting such threats were also described in this section.

Research Philosophy

The present study was guided by positivistic research philosophy. Positivism relies on quantifiable observations that culminate in statistical analyses. The research philosophy was geared at capturing research assumptions, nature, and knowledge based on the investigator's perspectives. It philosophizes researchers' knowledge and insights as

integrated into the study. According to Žukauskas et al. (2018), there are four major research philosophical approaches: pragmatist, positivist, interpretivist, and realistic philosophical methods.

Positivism is under the empiricist perspective that knowledge is derived from human experience, which can be understood as objective, observable aspects interacting with one another. The positivism approach remains the same in the logical-driven investigation throughout sciences and, at the same time, predicts the relationship within variables. The approach allowed reasoning aimed to formulate hypotheses in the research process. The positive approach is anchored on tenets of the quantitative methodology, where generalization and hypothesis testing are generated through statistical analysis of observations. Ryan (2018) also affirmed the philosophy by suggesting that the philosophy is based on factual figures that are observable.

Therefore, the studies that follow the philosophy through the knowledge from human experiences give an empirical view of the study. In a positivist research philosophy, the researcher remains an objective analyst and dissociates independently from personal emotions, attitudes, beliefs, and values. Instead, it examines facts as they present themselves from the source (Edson et al., 2016). Even though methodological diversity can enhance the research scope and implementation of its findings, it also influences the need for a researcher to explicitly address the implicit theoretical stances and the philosophical assumptions that underpin the evidentiary claims (Saunders et al., 2015).

Furthermore, Edson et al. (2016) stated that the primary principle of positivist philosophy is that all the factual knowledge about the research phenomenon is based on the positive information gained from the visual experiences and that any notion beyond this realm of demonstratable fact is considered metaphysical. Positivism is grounded on a natural scientist's philosophical standpoint based on observable reality in the community, which culminates in the production of generalizations. Positivism relates to the essentiality of what is more of a strict focus to consider facts devoid of interpretation of bias of humans (Scotland, 2012). In terms of epistemology within the confines of the positivism approach, the research ordinarily focuses on the facts or regularities that are observable and measurable. The phenomena to be observed and measured account for the credibility of data or evidence used in the study. The causal relationships between the data collated and analyzed allow researchers to generate law-life.

The idea of pragmatism is a contemporary concept that is increasingly gaining prominence. Things rarely operate in isolation. Instead, most phenomenon represents intersections and interlinkages between several factors; hence, pragmatism makes the suitable philosophical foundation for undertaking healthcare's complex and dynamic nature. The strength of pragmatic philosophy is that it can vigorously address qualitative aspects under investigation as opposed to positivist philosophy.

Interpretivism considers the relationship between researchers and reality inseparable from the ontological viewpoint. More often, primary-driven data formulated in interpretivist research is not generalizable (Alharahsheh & Pius, 2020). However,

qualitative research dimensions such as cross-cultural differences, ethnicity, and race can be inculcated into research. For instance, the aspects and experiences of patients living with chronic illness may show subjective experiences regarding happiness and satisfaction with healthcare services based on race or ethnicity. The interpretive paradigm allows researchers to integrate factors such as behavioral aspects observed in participants' experiences.

Thus, the interpretive approach permits the description of reality based on the assumptions and beliefs of the interpretivist researcher. Besides, the interpretivist paradigm allows centralization of the research and unique circumstances relevant to the participants. In general, interpretivism approaches the presentation of the total experience instead of capturing certain parts of it, questions, and identifies problems surrounding interest, participation, and commitment (Alharahsheh & Pius, 2020).

Contrary to the interpretive paradigm, which believes in more than one reality, the positivist paradigm assumes that there is a single form of reality that can only be identified and explained through research (Saunders et al., 2015). The positivism approach was applied in this paper because it suitably fits the study design that involves retrospective correlations study based on existing data to establish a relationship between the variables by testing the hypothesis. Therefore, the present study collected relevant quantitative evidence about grant fund allocation to FQHCs for chronic disease management, FQHC PPS reimbursement rates, and cost per patient. New knowledge generated from this study aimed to improve the efficiency of grant fund allocation and

FQHC PPS reimbursements to FQHCs to increase the quality-of-care services offered to type 2 diabetes and hypertension patients.

Research Design and Rationale

MacKinnon et al. (2012) stated that a variable is a term used to refer to a phenomenon, thing, place, or person that a study seeks to measure to some degree. For instance, in this study, the variables included patients 18 years old or older diagnosed with Type 2 diabetes and hypertension, the location of the United States, and the phenomenon of the matter of allocation of grants as well as insurance coverage with FQHC PPS reimbursement. All these qualify as the variables of the study hence the reason further demarcation has either dependent/predicted or independent/predictor, mediator, or moderator.

Shrout and Bolger (2012) hold that a dependent variable, influenced by other measured factors, is expected to change due to the confined manipulation of the predictor variable(s). Thus, the predicted variable is the presumed effect or outcome. For instance, the dimension or the phenomenon of the allocation of funds will be observed by noting the changes against the static or stable trend for insurance coverage with a PPS Reimbursement within FQHCs for Type 2 Diabetes and Hypertension patients. In line with the above, Muller et al. (2015) indicate that the independent or predictor variable remains stable and non-influenced or unaffected by other factors or variables sought for measurement and hence serves as the presumed cause.

For the current study, it was clear that the factors selected to be the predictor variables are expected to provide clear outcomes on how they influence the allocation of grant funds to the cohort in question.

Introducing other confounding factors in the relationship enabled the study to exceed the analysis of the main variables' simple relationship and obtain a larger or broader picture of the matter. In the same respect, the moderator and mediator variables proposed in the study will aid in formulating a much more complex correlational design which is vital for this doctoral project.

The model framework envisioned that PPS reimbursement within FQHCs for both Type 2 diabetes and hypertension patients influences not only the allocation of grants and related decisions but also the total well-being of the cohort. The prevalence of the patients and the capacity to access quality healthcare should be the goal of the insurance proceeds, reimbursement, and grant allocation. For that reason, it has been deemed wise to include patient experience and health outcomes as key mediator variables in the model to validate the efforts of the authorities to incentivize type 2 and hypertension patients. The same argument applies to those patients' demographics in terms of gender, age, race, and ethnicity influences the allocation of grants and their total well-being in accessing quality healthcare. The role of the mediating variables in the model is to constantly justify that all the monetary decisions and executions or policy development should promote the healing of type 2 diabetes and hypertension patients.

Moreover, the review of the effects of the cohort's demographics is to establish barriers to accessing fair insurance coverage and allocation of grants; and that no disparities exist based on the patient's demographic factors. In implementing the inferential statistical analysis, demographic factors will be operationalized as predictor variables and moderators to properly reflect on the issues at hand, especially healthcare inequity and social injustice.

The specific variables of the study included the following:

Independent/predictor variables: Patients with type 2 Diabetes seen at FQHCs; Patients with hypertension seen at FQHCs; patient demographic (gender, age, race, and ethnicity) characteristics, FQHC PPS.

Predicted/criterion variables: Allocation of grant funds, cost per patient.

Control variables: Patient experience; health outcomes.

Research Design

In this study, a quantitative approach was deployed. Quantitative research involves statistical conclusions to collect actionable insights focusing on numbers. The overall goal of quantitative research elements seeks to expand and embolden a study's conclusions in line with the hypothesis. In quantitative studies, the research process is geared toward testing the hypothesis. Unlike qualitative research, the quantitative technique focuses on purely mathematical data that leads to a conclusive judgment of a problem (Sheard, 2018).

The quantitative approach sought to address the research hypothesis. Thus, this study used correlation studies as a quantitative approach to answering research hypotheses. The selection of a quantitative research design was influenced by the need to collect data from substantial sample size and increase the generalizability of generated outcomes to the broader FQHCs population. According to Creswell and Creswell (2018), correlational research design measures the relationship between two or more variables without controlling them to determine whether an independent variable has significant effects on the dependent variable and to report the nature of the relationship, either negative or positive.

The correlational study design was a nonexperimental approach that allowed the prediction and explanation of variable relationships. Correlational study design examines how two or more variables are related. The relationship between these two variables can be either positive or negative (Lau, 2017). Correlational studies are geared towards unmasking the variation in the population features. They depend on exposure to an event of focus in the natural setting amongst its subjects. For instance, in eHealth, a correlational study can be applied to examine whether using eHealth as an event or intervention is linked to a specific feature (Lau, 2017). Correlational studies differ from comparative studies. In correlational studies, the researcher does not control the allocation of the sample population into groups for comparison purposes. Instead, the investigators advance variables such as an outcome of interest. After that, the investigators test hypothesized relations between the variables of interest.

The outcomes in correlational studies are often referred to as the dependent variables. Correlational studies and comparative studies share an objectivist view. Their variables are well-defined, measured, and analyzed to establish hypothesized relationships. Three primary forms of correlational studies exist. They include cohort studies that can be retrospective or prospective, where a sample population of subjects undergoes observation over a period based on the exposure of interest (Lau, 2017). The second type is cross-sectional studies, whereby a cohort study has only a single comparison in the case of exposed and unexposed subjects. Thus, cross-sectional correlational *studies* provide a view of outcomes and the linked features of the given cohort at a specified time. Finally, correlational studies can be case-control studies involving the exposure of sample subjects to an event of interest or intervention. The subjects exposed to the intervention, or an event of interest are compared to those not exposed while maintaining other factors constants; then, the variations in the category of subjects are analyzed from predetermined outcomes.

Similarly, case-control studies are retrospective, exposing subjects to the phenomenon. They are selected and then compared with unexposed subjects by utilizing historical data to ensure similarities in features. The three present options in choosing a study design or method for this project are establishing the connection between federal funding of FQHCs and several aspects of predetermine outcomes occasioned by rising numbers of diabetic and hypertensive cases. Since this project used archived data, it assumed retrospective correlation study methodology is its approach or design. A

retrospective study focuses backward by examining events and interventions with or in connection to determine the study's outcomes.

Therefore, a correlational research design was appropriate as the present study assessed the possible relationship between grant fund allocations to FQHCs and the increasing number of type 2 diabetes and hypertension patients. This study also assessed the possible relationship between the FQHC PPS reimbursement rate and cost per patient. Therefore, this analysis can explain the impact between grant fund allocation and FQHC PPS reimbursements to FQHCs with increased type 2 diabetes patients, hypertension patients, and cost per patient. The data was examined in five years (2016-2020).

Therefore, the present quantitative analysis helped pinpoint the growing prevalence of type 2 diabetes and hypertension on FQHC grant funds allocations. According to Coolican (2018), the research design selected by a researcher often determines the types of outcomes generated and their generalizability to the wider study population. For instance, the selection of a quantitative research design was influenced by the need to collect data from substantial sample size and increase the generalizability of generated outcomes to the broader FQHC population from quantitative methodology. Data derived from HRSA needed to be analyzed in relation to rising cases of diabetes and hypertension.

Time and Resource Constraints

The time and resource constraints consistent with the research design were identified in this part of the study. As noted by Artigues et al. (2013), time constraints in

research point to the limitations experienced from the beginning to the end of the implementation of the study. For instance, given the lengthy nature of the research and detailed fact finding, meeting the deadlines set for the formulation of each section of the study was impossible. Moreover, it requires more time to compile appropriate data to measure each study's variables, including its normalization. Further, Jozefowska and Weglarz (2016) stated that resource constraints in research address the limitations experienced in input coordination and its availability to complete a research project. The key resource constraints applied to the ongoing study were the efforts to meet each aspect of the inclusion/exclusion criteria. A good example is a need for consistent, longitudinal, and consistent statistical data aligned to the study's variables.

Another constraint was the access to benchmark data meant to compare with the trends for health outcomes for hypertension and diabetes for critical analysis and validation of the hypothesis testing results. In this case, the resource constraints mentioned were on the data used to measure the relationship of the key variables affecting the execution of the correlation study by not allowing for extra benchmark analysis to increase the reliability and validity of the outcomes.

Methodology

Population

According to Etikan et al. (2016), a population serves as any gathering related to a specific group of individuals or nonhuman subjects, like institutions, objects, geographical territories, time units, and currencies. For instance, in this study, all adults

ages 18 years old and older with a diagnosis of either type 2 diabetes or hypertension who were seen at an FQHC as a collection were the population. The inclusion and exclusion criteria of the study were addressed since the priority of the doctoral study was to ensure that the subject population and the supporting data possessed the characteristics necessary to achieve the objectives, aims, and purposes.

Sampling and Samling Procedure

On the other hand, a sample refers to a selected cohort from the overall or total population (Emerson, 2015). Thus, from the review of the selected sample, it became possible to understand or know something regarding the entire population. Similarly, it is inferred that the revelation about a given sample on true propositions can thus be considered so for the entire population (Bernard, 2011).

An analysis method was employed to sample the number of participants in this study. The first step involved downloading and installing the software *G*Power v. 3.1.9.7* (Buchner et al., 2021). This software was used to conduct power analysis, and several assumptions were made to complete the sample size estimation. Firstly, a significance level of 0.05 was employed because it is the standard value in most statistical analyses when considering a 95% confidence interval. Secondly, a power value of 80% is in line with the recommendations of UCLA (2021) concerning sample size calculations. The number of groups for the current study was two, involving those patients with type 2 diabetes and patients with hypertension. For this study, the mean was 176 for the groups because CDC (2021) estimated the national unadjusted PPS

reimbursement rate was $176.45. After entering the data in G*Power software, the effect size of F = 0.35, and the output was obtained. From the output, it was realized that a sample size of 68 was needed for the study.

In application to this study, the sample selected all Federally Qualified Health Centers in the United States within the limitations provided by *data.HRSA.gov*. In other words, the sampled population consisted of UDS data from FQHC awardees in the United States between 2016-2020. The sample size for this study was 6,862.

As indicated by Salkind (2010), inclusion criteria include the properties which the subjects or information ought to have to be incorporated in the study. On the other hand, exclusion criteria refer to the subjects' characteristics or information that disqualifies either of them from being incorporated into the research (Abrams et al., 2014). For instance, the ongoing project did not require primary information from the human participants to use questionnaires or surveys.

However, that information was retrieved from secondary-existing statistical data, which had to meet the inclusion and exclusion criteria. For instance, the inclusion criteria sought in the study featured the following: (a) the data included in the study must fall in the age bracket 2016-2020; hence it should be possible to view all trends for the respective years; (b) the data should be consistent and with negligible missing data slots, and (c) the data must directly measure the identified variables of the study to avoid too much benchmarking; therefore, the data should be specific to the key variables of the study, and this should be verifiable from the source which is *data.HRSA.gov*.

In other words, all data used for the statistical analysis and testing of the hypothesis must fully and nominally represent each of the variables, and the verification should be possible based on the primary source of the data. For the exclusion criteria, the following apply: (a) any data that has extreme outliers must be removed from the analysis to avoid errors of estimations in predictions and relationship modelling (b) statistical data lacking proper representation of the variables set in the study and (c) any data with less capacity to be downloaded from the actual source as this is a precursor to verification of the same if needed by the university chair.

Data Analysis Plan

Before any data could be collected and analyzed, IRB approval had to be obtained. The IRB approval number for this study was 01-21-22-0756908. With IRB approval, the data was collected to conduct a retrospective correlation study using archival data and established Pearson's *r* Correlation Coefficient with SPSS. Archival data is information already existing in someone else's files, websites maintained by government organizations, public records from government agencies or organizations, institutional research databases, or rented or storage data firms and stores. The term archival data implies data that already exist, including observations, texts, or other information that predate a planned research project instead of data collected for the core goal of a specific research project (Fisher, & Barnes-Farrell, 2013). Researchers incorporate archival data in their secondary data analysis, consisting of specific analyses

performed post-collection of primary data. Thus, secondary data analyses may replicate a re-examination of data for their originally intended purposes.

More often, archival data is produced for reporting or research purposes and maintained for legal requirements, reference, and internal recording (Fisher, & Barnes-Farrell, 2013). Since archival data is derived from the already occurred events, this data can be described as fixed data since it is not subject to further alterations.

Researchers may prefer archival data for various reasons. The data which is required for collections may not be available else. Archival data is often original or primary, meaning the researcher has more control over what data to collate and analyze. Since archival data is already collected and stored, it is less time-consuming for the researcher to collate and analyze such data, thereby saving time and resources (Creswell & Creswell, 2018). Sometimes, archival data has some parts already processed, saving the researcher from reorganizing, and transcribing raw data. Archival data can also cover essential areas that you might not have established or incorporated in the major point of focus; thereby, archival data might be used to re-engineer content or integrate some new pattern of relationships.

Finally, archival data allows researchers to limit errors that often arise from sampling processes and observational biases (Coolican, 2018). Archival data sources are preferred due to these advantages and their ability to serve as sources for community-level indications such as specified information on characteristics of the target population under the study: core demographics such as age, gender, ethnicity, income aspects, and

geographical locations: behavioral patterns such as physical activity and diet: health and development outcomes such as the prevalence of specified diseases including diabetes and hypertension; and cultural information.

The selection of archived data from Health Resource and Services Administrations (HRSA) with its data hosting website hrsa.data.gov was influenced by their high reputation of hosting up-to-date and high-quality evidence about type 2 diabetes and hypertension in the United States, the role of FQHCs in type 2 diabetes, and hypertension management and cost per patient.

The Health Resources and Services Administration primarily functions to improve accessibility to health care for individuals who are medically vulnerable, uninsured, or isolated. The partly reason undergirding the choice of HRSA as a source of data is that HRSA plays a critical role in providing financial support to healthcare providers and overseeing many programs geared towards providing help to geographically isolated and economically or medically vulnerable. HRSA has four fundamental goals that include: improving access to quality services; supporting healthcare workforce capacity to cater to the existing and emerging healthcare needs; achieving HRSA equity and enhanced population health and optimizing HRSA operations; and strengthening program management (hrsa.data.gov).

Coolican (2018) explained that archival data is essential in the health care search because they often contain comprehensive information about the research phenomenon that might not be collected using a simple questionnaire and survey approaches.

Furthermore, this study focused on assessing the efficiency of grant funds awarded to FQHCs as a whole; therefore, collecting primary data would be time-consuming and prone to errors and biases because of the large sample size and targeted population area. As stated by Coolican (2018) and Creswell and Creswell (2018), the collection of archival data is more accessible and less time-consuming compared to the primary data, and such information may have already been processed by people who are statistical experts hence limiting the occurrence of errors during data collection and analysis. Specifically, the data in hrsa.data.gov were initially collected from the FQHCs and processed by statistical expertise, ensuring their authenticity.

Research Questions and Hypotheses

The study was based on four research questions and associated hypothesis:

RQ1: What correlation exists between the number of patients with type 2 diabetes seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$1: There is no statistically significant association between the number of patients with type 2 diabetes seen at FQHCs and the allocation of grant funds.

H_a1: There is a statistically significant association between the numbers of patients with type 2 diabetes seen at FQHCs allocation of federal grant funds

RQ2: What correlation exists between the number of patients with hypertension seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$2: There is no statistically significant association between the number of patients with hypertension seen at FQHCs and the allocation of grant funds.

*H_a*2: There is a statistically significant association between the number of patients with hypertension seen at FQHCs and the allocation of grant funds.

RQ3: What correlation exists between patient demographic characteristics (gender, age, race, and ethnicity) and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

*H_0*3: There is no statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

*H_a*3*:* There is a statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

RQ4: What correlation exists between the Federally Qualified Health Center Prospective Payment System and cost per patient?

*H_0*4: There is no statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

*H_a*4*:* There is a statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

Threats to Validity

As noted by Creswell and Creswell (2018), validity is the degree to which the study approach measures what is intended by the study being executed. Correlational studies encounter similar challenges to those comparative studies due to their internal and

external validity emanating from the design choices, confounders, selection bias, and reporting consistency (Lau, 2017). Selection bias is one of the factors that can reduce the validity experienced in the present study. Specifically, this study relied on data previously collected by other experts for new knowledge development. Therefore, selection bias might be introduced into the study if the researchers collect the secondary data without assessing their appropriateness to the research purpose. Furthermore, the researcher might only select and collect data that best suits the present study's purpose. For that matter, a random selection of secondary data presented in UDS Clinical Quality Measures for 2016, 2017, 2018, 2019, and 2020 was necessary for limiting the possibility of selection bias.

Ethical Procedures

Procedures

Upon approval of this research proposal, I obtained institutional review board (IRB) approval before collecting research data. Letters of consent were not required as human subjects were not used. I downloaded data from the research site to review and analyze. I conducted data collection and review over 30 days. Upon the expiration of the review period, I analyzed and transcribed the data with the results included in the research.

The correlational study was in line with ethical standards. Since the study does not involve direct subjects, ethical issues such as consent did not apply. Issues related to informed consent, voluntary participation, no harm, confidentiality, and anonymity were

addressed or may not apply. The data from archived sources did not have patient details. Thus, confidentiality concerns did not arise in this study.

Moreover, archival data must fulfill ethical requirements such as zero tolerance for manipulating the source, trends, and patterns. Thus, the data should be fully disclosed, and referential details provided to render the reporting ethical and trustworthy. Another ethical consideration is to include the need for the privacy of any sensitive information aligned to the data, especially the author's career and personal information where applicable, and respect to the privacy and confidentiality policies provided by the data.HRSA.gov.

Summary

Overall, the current section presented the methodological framework sought in the study, which embeds quantitative techniques. Therefore, the study aimed to rely on statistical data representing each of the variable constructs to validate the hypotheses and draw implications for healthcare policy. In the next section, the actual implementation of the stated methodology was achieved.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this quantitative study was to determine the relationship between the number of patients with hypertension and type 2 diabetes and grant fund allocations to FQHCs. The following research questions and hypotheses were created to address this purpose:

RQ1: What correlation exists between the number of patients with type 2 diabetes seen at FQHCs and allocation of grant funds from the years 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$1: There is no statistically significant association between the number of patients with type 2 diabetes seen at FQHCs and allocation of grant funds.

H_a1: There is a statistically significant association between the numbers of patients with type 2 diabetes seen at FQHCs allocation of federal grant funds

RQ2: What correlation exists between the number of patients with hypertension seen at FQHCs and allocation of grant funds from the years 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$2*:* There is no statistically significant association the number of patients with hypertension seen at FQHCs and allocation of grant funds.

H_a2: There is a statistically significant association between the number of patients with hypertension seen at FQHCs and allocation of grant funds.

RQ3: What correlation exists between patient demographic characteristics (gender, age, race, and ethnicity) and the allocation of grant funds from the years 2016 – 2020 and among adults 18 years old and older in the United States?

$H_0$3: There is no statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

H_a3*:* There is a statistically significant association between patient demographic (gender, age, race, and ethnicity) characteristics and the allocation of grant funds.

RQ4: What correlation exists between the Federally Qualified Health Center Prospective Payment System and cost per patient?

$H_0$4: There is no statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

H_a4: There is a statistically significant association between the Federally Qualified Health Center Prospective Payment System and cost per patient.

Data Collection of Secondary Data Set

Archival data was used for this study. The sampling from the 2016-2020 Uniform Data System included 6,862 FQHC awards. I accessed the HRSA website data.hrsa.gov between January 2022 through March 2022. When access the archival data it was realized that pertain data needed to answer the research questions was not available. I was unable to determine from the available data how many patients with type 2 diabetes and hypertension also had insurance with a PPS reimbursement rate. Therefore, the research study and questions had to slightly changed. The sample participants included adult patients ages 18 years old and older who either had a diagnosis of type 2 diabetes or hypertension seen at a FQHC.

Results

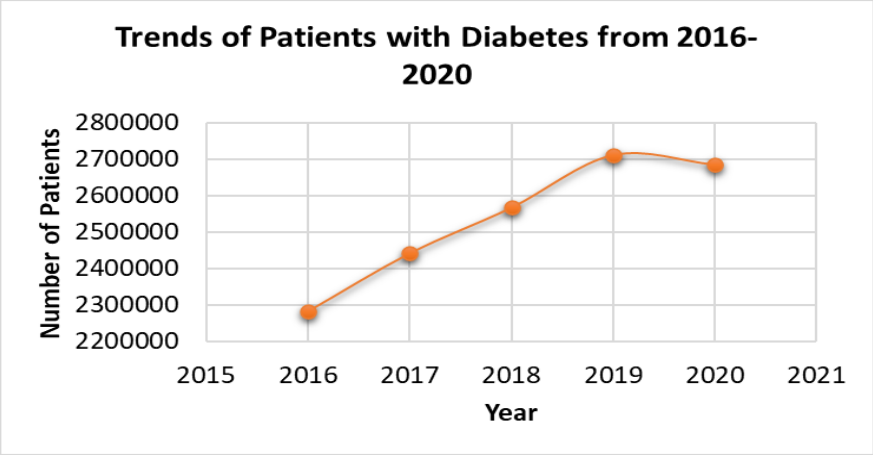
Trends for Patients with Diabetes

The data showing the number of patients with type 2 diabetes seen at FQHCs from 2016-2020 was summarized in Figure 7. From Figure 7, it is realized that there has been a constant rise of the number of patients with type 2 diabetes visiting FQHCs. In particular,

the result shows that from 2016-2019, there was a progressive increase of diabetes patients from 2.28 million to 2.71 million. However, from 2019-2020, there was a slight decrease in the number of recorded diabetes patients from 2.71 million to 2.68 million. The obtained result suggests that there is a need to not only explore effective preventive measures for diabetes, but also expansion of FQHC services to reach more patients affected. Notably, the highest figures of diabetes patients were recorded in 2019 at 2.52 million cases that visited FQHCs. This implies that the year was characterized with the highest medical expenditure on diabetes cases for the entire study period. The drop witnessed in 2020 could be explained by the onset of the pandemic and Covid-19 as there was a decrease in total number pf patients seen at FQHCs in general.

Figure 7

Trends of Patients with Diabetes from 2016-2020 by FQHCs



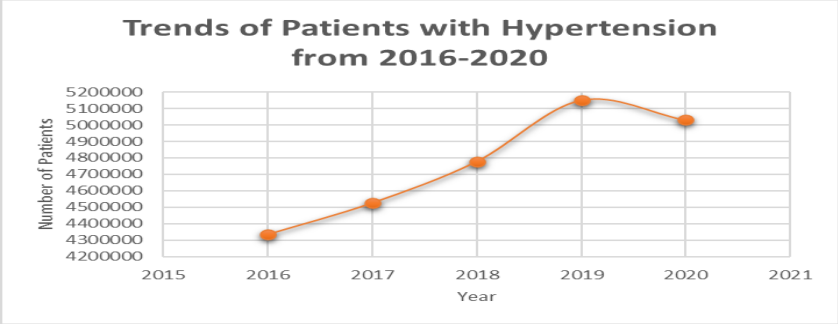
Trends for Patients with Hypertension

Data indicating number of patients with hypertension who accessed services by FQHCs from 2016-2020 were depicted in the figure (8). From figure (8), it is noted that the number of patients with hypertension seen at FQHCs increased steadily from 2016 to 2020. Specifically, the record indicated about 4.34 million in 2016 and 5.15 million in the year 2020. The rising trend suggests that the FQHC facilities have had much to handle within the stated years which translates to increased expenditure. The finding in figure eight also revealed that from 2019 - 2020, there was a drop in the number of hypertension patients from 5.15 million to 5.03 million.

The findings can be contributed again to Covid-19 pandemic. Nevertheless, the trend also poses a warning to the healthcare department by suggesting that suitable interventions are required to cap the increase of hypertension cases and other heart conditions. Based on the trend observed, the number of hypertension patients served by FQHCs has been increasing and supportive strategies need to be implemented to reverse the trend.

Figure 8

Trends of Patients with Hypertension from 2016-2020 Served by FQHC



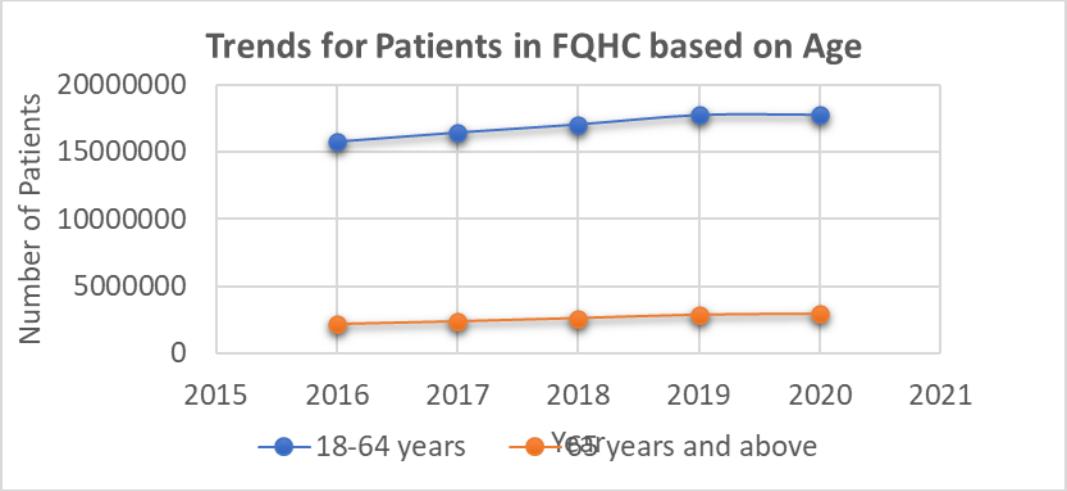
Demographics of Patients (Gender, Ethnicity, Age)

Trends for Patients Based on Age

The trends for patients served in FQHCs based on age was noted as shown in figure 9. For this study only data for patients 18-years-old or older were considered Figure 9, shows patients in two age brackets 18-64 years old and those 65 and older seen at FQHCs. Those patients aged between 18 to 64 years increased from 15.7 million in 2016 to 17.79 million people in 2020. On the other hand, those patients aged 65 years and above only increased from 2.14 million in 2016 to 2.93 million in 2020. The results obtained suggests that dependence on FQHCs has been on the rise regardless of the age difference in the country. This means that the system as witnessed considerable expansion over the years to accommodate additional patients in the FQHC program. Notably, the number of the younger adults was significantly higher than that of elderly adults above 65 years old. The difference implies that the older generation in the country is far much smaller than the younger population. Therefore, based on age, more adults between 18 to 64 years old are served in FQHCs than those who are older.

Figure 9

Trends for Patients Served in FQHC Based on Age (HRSA, 2021)



Trends of Patients Based on Gender

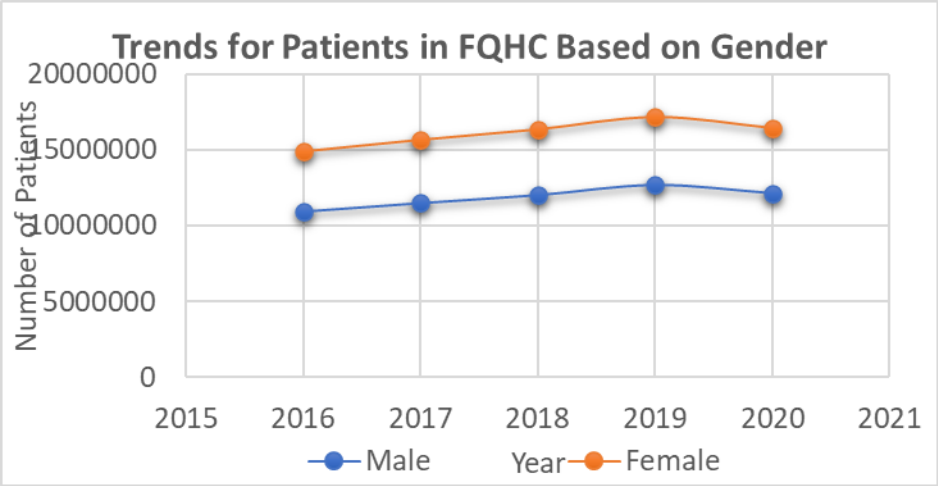
The trend for number of patients based on gender in FQHCs was obtained as shown in figure 10. From figure 10, it is realized that there have been more females than males in FQHCs over the years. Moreover, the results indicate that the number of both male and female in FQHCs has been increasing. Specifically, the female in FQHCs in 2016 were 14.93 million and increased to 17.15 million in 2019. On the other hand, males were 10.92 million in 2016 and the number increased to 12.68 million in 2019. However, between 2019 and 2020, there was a drop in the number of people in FQHCs for all genders. Having more female than male in FQHCs suggests higher females in the country or even possible higher susceptibility to diseases.

In the meantime, the general increase in numbers for all genders between 2016 and 2019 suggests improved access to FQHCs and reduction in gender-based restrictions. Finally,

the drop recorded in 2020 shows that the pandemic affected accessibility to FQHCs. Overall, all genders are represented such that the slight difference in numbers does not impact the outcome of the research.

Figure 10

Trends for Patients Served in FQHC Based on Gender (HRSA, 2021)



Trends of Patients Based on Ethnicity

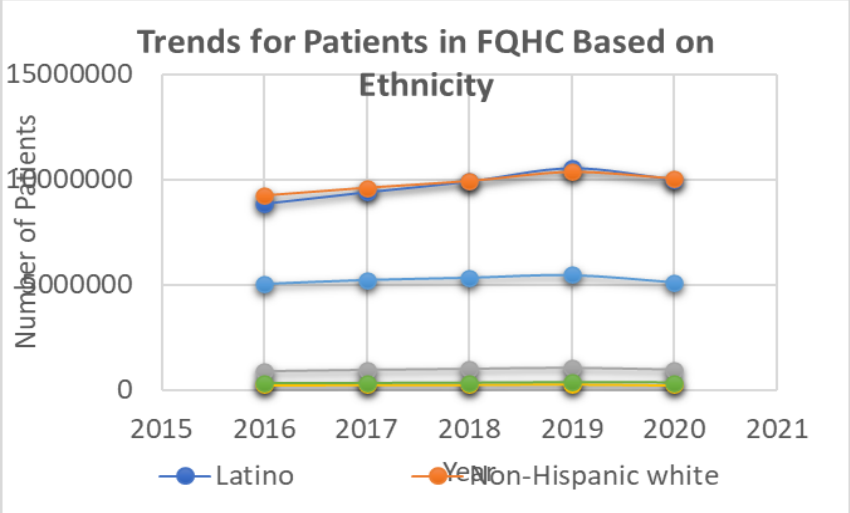
From figure 11, it is noted that the largest number of patients in FQHCs are Hispanic/Latino and Non-Hispanic whites with figures above eight million. This number is not surprising since FQHCs are known for serving the population of Migrant and Seasonal Farm Workers and the uninsured. This is followed by African American ethnic group and finally the other ethnicities including Native Hawaiian, Asian, and American India have the least representation in FQHCs. The result implies that healthcare needs differ across ethnic communities and the inclusion in FQHCs dependents on the population distribution of the various ethnicities. However, the presence of all the

ethnicities in FQHCs suggests that equal opportunity is given to all the communities to benefit from the program.

Notably, Latino, Non-Hispanic White, and African American people in FQHCs are noted to show a rising trend over the years apart from 2020. The outcome of 2020 is still related to the devastation caused by the pandemic. Nevertheless, the increase recorded between 2016 and 2019 is an indication that patients are continuously developing confidence and trusting the efficacy of FQHCs. The highest increase rate was depicted by the Latino who started slightly lower in 2016 but gained momentum rapidly to top the table in 2019.

Figure 11

Trends for Patients Served in FQHC Based on Gender



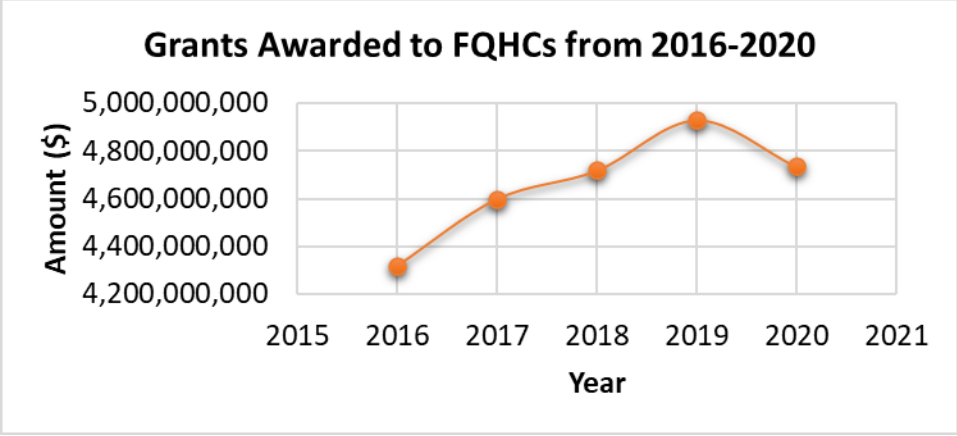
Grant Funds Awarded to FQHCs from 2016-2020

The data for grants awarded to FQHCs from 2016 to 2020 under Medicaid was summarized in figure 12. From figure 12, it is realized that there has been a general increase in the amount of grant funds awarded to FQHCs. Specifically, the amount rose

from $4.31 billion in 2016 to a maximum value of $4.92 billion in 2019 before dropping slightly to 4.73 billion in 2020. The rise in grant funds allocated to FQHCs from 2016 to 2019 is attributed to rising cases of chronic illnesses such as diabetes and hypertension as shown in figures 7 and 8. In this regard, it is realized that the federal government recognizes the challenge posed by chronic illnesses and expands existing FQHCs to ensure affordable care is provided to more patients who need it However, from figure 12, it is also realized that from 2019 to 2020, there was a drop in the amount of grants awarded to FQHCs. The trend is attributed to more healthcare expenses being channeled to manage Covid-19 pandemic. Moreover, the finding is attributed to the drop in the number of patients with diabetes and hypertension as shown in figures seven and eight, which meant that fewer resources were required to provide the care in 2020 compared to 2019.

Figure 12

Trends for Patients Served in FQHC Based on Gender



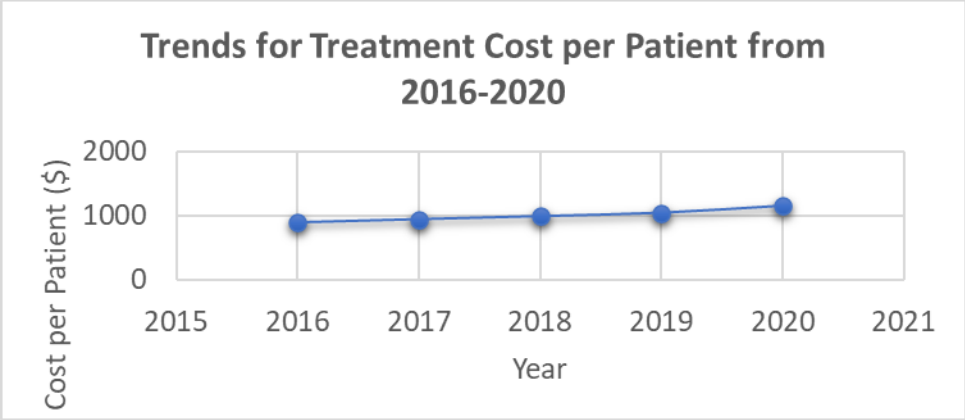
Cost per Patient

The trends showing estimated treatment cost per patient was summarized in figure 13. From figure 13, it is realized that treatment cost per patient exhibits a constant increase over the years. Specifically, the cost per patient in 2016 was $889.85 which increased to $1156.82 in 2020 a 30% increase. Also, the rate of increase between 2019 and 2020 was higher than all the other previous years. The general increase in cost of treating one patient suggests that the overall cost of healthcare has been rising over the years. Moreover, the finding implies that conditions that people suffer from have been getting more complex with time and hence more resources must be committed to treatment. This shows that the burden on FQHCs has also increased over the years with 2020 being the peek.

In the meantime, the rise from $1044 in 2019 to $1156 in 2020 is the largest recorded increase of the entire period studied. The finding suggests that the medical expenditure in 2020 was out of the ordinary. The shift in trend can therefore indicate that medical costs for treating patients significantly went up with the advent of the pandemic which interrupted supply chains. The increase in the cost of treating a patient pointed to the fact that FQHCs have been forced to incur extra charges each year as conditions such as diabetes and hypertension keep getting more complex year after year.

Figure 13

Trends for Treatment Cost per Patients from 2016-2020

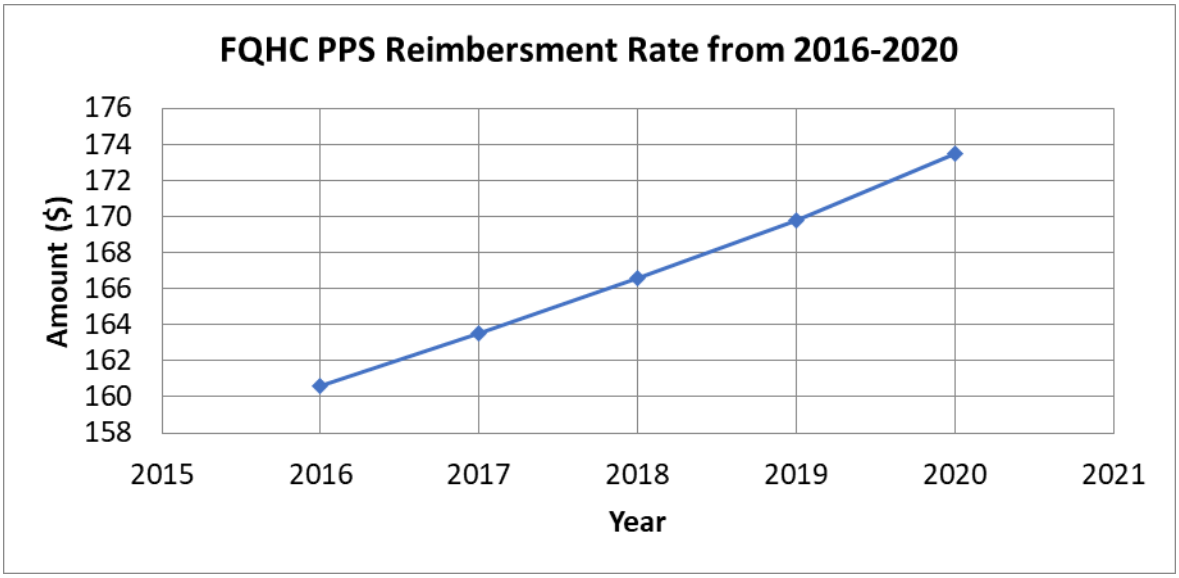


FQHC PPS Reimbursement Rate from 2016-2020

Figure 14 shows the FQHC PPS reimbursement rate from 2016-2020 (CMS, 2020) From figure 14, it is realized that the FQHC PPS reimbursement rates did increase from $160.6 in 2016 to $173.5 in the year 2020, but only an 8% increase which is a lot less compared to the figure 9 where the cost per patient increased 30% in the same time frame.

Figure 14

Trends for FQHC PPS Reimbursement Rates



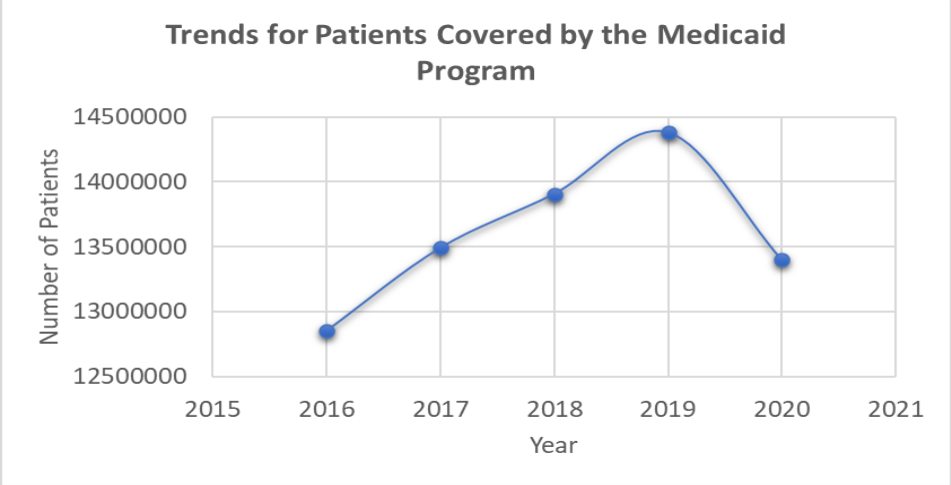
Trends of Patients with Medicaid

From figure 15, it is noted that there has been an increase in the number of people with Medicaid followed by a sudden drop. Specifically, an increase in Medicaid holders was witnessed from 12.85 million in 2016 to 14.38 million in 2019. Meanwhile, there was a significant drop of patients with Medicaid in 2020 to 13.39 million people. The increase recorded up to the year 2019 suggests that there has been increased government efforts to promote affordable healthcare for the entire population.

Medicaid has ensured that patients are able to benefit from quality healthcare provided in the government facilities. Also, increase in patients covered by Medicaid coincides with the increase in the number of patients with diabetes and hypertension. However, the drop observed in 2020 suggests that some patients lost their Medicaid coverage during the pandemic, or this could be due to the deaths caused by Covid-19.

Figure 15

Trends for Patients Seen at FQHCs Covered by Medicaid Program 2016-2020



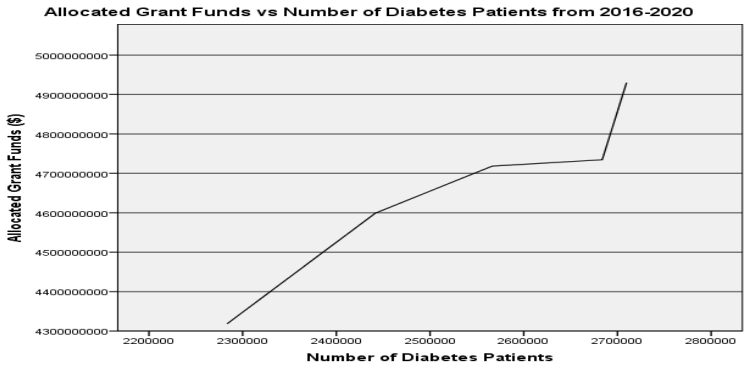
RQ1: What correlation exists between the number of patients with type 2 diabetes seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

Relationship Between Type 2 Diabetes Patients and Allocation of Grant Funds

A comparison between the number of type 2 diabetes patients and the allocation of grants is summarized in Figure 16. From Figure 16, it is noted that there is a positive relationship between allocated grant funds and number of diabetes patients. Specifically, from 2.3 million diabetes patients to 2.6 million patients, there is a proportionate rise in the allocation of grant funds. However, above 2.7 million patients with diabetes, there is an exponential allocation of grant funds. The finding implies that at lower number of diabetes patients, the allocated grant funds are added to help FQHCs manage the increase in cases. However, at high number of diabetes cases, the issue is regarded as a critical issue and significant amount of funds are allocated to help deal with the issue.

Figure 16

Allocated Grant Funds Versa Number of Diabetes Patients from 2016-2020.



To better understand the relationship between diabetes patients and allocated grant funds, a correlation analysis was conducted, and the result summarized in table 1. From the correlations table 1, it is noted that the number of diabetes patients and grant allocated have a positive correlation with a coefficient of 0.952. This implies that allocated grant increased by a factor of 0.952 for a unit increase in the number of diabetes patients. Additionally, the correlation is realized to be significant due to the p-value of 0.013 which is less than 0.05. The finding also helps to analyze the first research question concerning the relationship between number of type 2 diabetes patients and allocation of grant funds. In particular, the finding rejected the null hypothesis initially developed that there is no statistically significant association between the number of patients with type 2 diabetes seen at FQHCs and allocation of grant funds.

Table 1

Correlation Results for Allocated Grant Funds and Diabetes Patients

Correlations

		Diabetes	Grants
Diabetes	Pearson Correlation	1	.952*
	Sig. (2-tailed)		.013
	N	5	5
Grants	Pearson Correlation	.952*	1
	Sig. (2-tailed)	.013	
	N	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

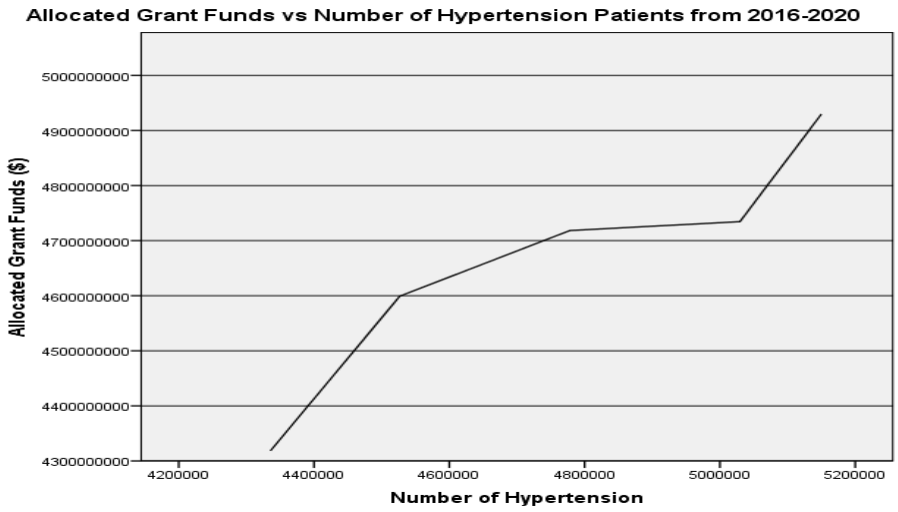
RQ2: What correlation exists between the number of patients with hypertension seen at FQHCs and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

Relationship Between Hypertension Patients and Allocation of Grant Funds

A comparison between the number of hypertension patients and the allocation of grants is summarized in figure 17. From figure 17, the general trend showed that allocated grand funds increased as the number of hypertension patients increased between 2016 and 2020. This shows that the two variables exhibited a positive relationship over the years. The finding implies that grant funds allocation for FQHCs is responsive to the number of patients suffering from hypertension. Further the finding implies that grant funds allocation to FQHCs is influenced by number of chronic illnesses such as hypertension.

Figure 17

Allocated Grant Funds Verses Number of Hypertension Patients from 2016-2020.



From the correlation test summarized in table 2, it is realized that a positive association defined by a correlation co-efficient of 0.937 exists between grants and hypertension cases. This implies that grant allocation has been increasing by a factor of 0.937 with a unit increase in hypertension patients. In addition, the correlation is realized to be significant since the p-value is 0.019 which is lower than 0.05. The result helped to analyze the second hypothesis made regarding the relationship between allocation of grant funds and the number of hypertension patient. In particular, the finding rejected the null hypothesis developed at the beginning of the research stating there is no statistically significant association between the number of patients with hypertension seen at FQHCs and allocation of grant funds.

Table 2

Correlation Results for Allocated Grant Funds and Hypertension Patients

Correlations

		Grants	Hypertension
Grants	Pearson Correlation	1	.937*
	Sig. (2-tailed)		.019
	N	5	5
Hypertension	Pearson Correlation	.937*	1
	Sig. (2-tailed)	.019	
	N	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

RQ3: What correlation exists between patient demographics (gender, age, race, and ethnicity) and the allocation of grant funds from 2016 – 2020 and among adults 18 years old and older in the United States?

Relationship Between Patient Demographics and Allocation of Grant Funds

Gender

The relationship between gender and allocation of grant funds was determined by correlation analysis and the result summarized in table three. From table 3, it is noted that grant allocation exhibits a positive correlation with both male and female patients. Specifically, the coefficient of the correlation with male is 0.987 while that for female is noted as 0.99. The implication is that an increase in male and female patients in FQHCs contributes to a rise in the amount of grant funds allocated for the FQHCs. Moreover, the results show that the relationship between grant fund allocations based on gender is significant. This is indicated by the p-values of 0.002 and 0.001 for male and female respectively all of which are lower than the significant level of 0.05. The result suggests that gender distribution of diabetes and hypertension patients is a significant factor considered in allocating funds for FQHCs.

Table 3

Correlation Results for Allocated Grant Funds and Gender of Patients

Correlations

		Grants	Male	Female
Grants	Pearson Correlation	1	.987**	.990**
	Sig. (2-tailed)		.002	.001
	N	5	5	5
Male	Pearson Correlation	.987**	1	.999**
	Sig. (2-tailed)	.002		.000
	N	5	5	5
Female	Pearson Correlation	.990**	.999**	1
	Sig. (2-tailed)	.001	.000	
	N	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

Ethnicity

The relationship between ethnicity and allocation of grant funds was determined by correlation analysis and the result summarized in table 4. From table 4, it is realized that grant allocation has a positive correlation with all the ethnic groups. The finding implies that there has been an increase in the amount of money allocated for the FQHCs which is attributed to the increase in the numbers represented by each ethnic group. This agrees with the finding that an increase in the number of patients attracted an increase in the amount of grant fund allocation across the study period. Regarding significance, most of the p-values of the ethnic groups are lower than the significance levels of 0.05 except for Native Hawaii (p = 0.232) and African American (p =0.084).

The result implies that there is a significant increase in grant funding for patients who are Latino, Non-Hispanic white, Asian, and American Indian but there is insignificant increase in funding for Native Hawaii and African American. The result suggests that there is a need to review policies on grant funding of FQHCs and eliminate any discriminatory practices based on ethnicity.

Table 4

Correlation Results for Allocated Grant Funds and Ethnicity of Patients

Correlations

		Grants	Latino	Non_Hispanic_White	Asian	Native_Hawaii	African_American	American_Indian
Grants	Pearson Correlation	1	.988**	.986**	.966**	.653	.828	.939*
	Sig. (2-tailed)		.002	.002	.007	.232	.084	.018
	N	5	5	5	5	5	5	5
Latino	Pearson Correlation	.988**	1	.999**	.951*	.616	.792	.973**
	Sig. (2-tailed)	.002		.000	.013	.268	.110	.005
	N	5	5	5	5	5	5	5
Non_Hispanic_White	Pearson Correlation	.986**	.999**	1	.936*	.582	.764	.979**
	Sig. (2-tailed)	.002	.000		.019	.303	.133	.004
	N	5	5	5	5	5	5	5
Asian	Pearson Correlation	.966**	.951*	.936*	1	.802	.939*	.862
	Sig. (2-tailed)	.007	.013	.019		.103	.018	.060
	N	5	5	5	5	5	5	5
Native_Hawaii	Pearson Correlation	.653	.616	.582	.802	1	.948*	.502
	Sig. (2-tailed)	.232	.268	.303	.103		.014	.388
	N	5	5	5	5	5	5	5
African_American	Pearson Correlation	.828	.792	.764	.939*	.948*	1	.663
	Sig. (2-tailed)	.084	.110	.133	.018	.014		.222
	N	5	5	5	5	5	5	5
American_Indian	Pearson Correlation	.939*	.973**	.979**	.862	.502	.663	1
	Sig. (2-tailed)	.018	.005	.004	.060	.388	.222	
	N	5	5	5	5	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Age

The relationship between age and allocation of grant funds was determined by correlation analysis and the result summarized in Table 5. From Table 5, the correlations analysis revealed a positive relationship between allocated grant funds and age of patients. For the adults aged 18-64 years, the correlation coefficient was determined as 0.926 while the adults aged 65 years and above had a correlation coefficient of 0.889. The finding implies that grant allocation increased over the studied period with a rise in the number of patients of different age groups. The results also indicated that the correlations were lower than the significance levels as noted by p-values of 0.024 and 0.043 for 18-64 years and 65 years and above. The result suggests that there is a statistically significant relationship between age of patients and the amount of grant

allocated to FQHCs. Nevertheless, the influence of the 18-64 years old patients is stronger than the 65 and older patients in FQHCs.

Table 5

Correlation Results for Allocated Grant Funds and Age of Patients

Correlations

		Grants	Eighteen_to_sixty_four_years	Above_sixty_four_years
Grants	Pearson Correlation	1	.926*	.889*
	Sig. (2-tailed)		.024	.043
	N	5	5	5
Eighteen_to_sixty_four_years	Pearson Correlation	.926*	1	.996**
	Sig. (2-tailed)	.024		.000
	N	5	5	5
Above_sixty_four_years	Pearson Correlation	.889*	.996**	1
	Sig. (2-tailed)	.043	.000	
	N	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The obtained results on age, ethnicity, and gender were crucial in analyzing the third hypothesis developed. There was a statistically significant relationship found within the analysis of the relationship between the demographic's factors (gender, ethnicity, and age) and the allocation of grant funds, therefore, the null hypothesis was rejected.

RQ4: What correlation exists between the Federally Qualified Health Center Prospective Payment System and cost per patient?

Relationship Between FQHC PPS, Patients with Medicaid, and Cost per Patient

To obtain in-depth insight into the relationship between cost per patient, patients with Medicaid, and FQHC PPS, a correlation analysis was conducted, and the results summarized from table 6, it is realized that the significant and highest correlation was

between FQHC PPS and cost per patient (c = 0.989; p =0.001). The finding implies that as the treatment cost per patient increased, there was a significant increase in FQHC PPS reimbursement rates provided by Medicaid to FQHCs. The strategy ensures healthcare affordability for most patients despite the increasing care costs.

In addition, table 6 also reveals that a significant and high correlation between number of patients with Medicaid and FQHC PPS (c = 0.903; p = 0.036). The result suggests that the increase in FQHC PPS was also influenced by the increasing number of patients covered by Medicaid. More patients who have Medicaid coverage implies increased funding for healthcare thereby enabling Medicaid to increase PPS reimbursement rates to FQHCs and ensure quality of care is maintained despite the increasing inflation challenges. However, it was realized that the relationship between cost per patient and number of Medicaid users is insignificant since p = 0.078 which is greater than 0.05. In this regard, it is concluded that the number of Medicaid users do not influence cost of treatment, but they influence the FQHC PPS reimbursement rate.

Table 6

Correlation results for patients with Medicaid, cost per patient, and FQHC PPS

Correlations

		Medicaid_Users	Cost_per_Patient	FQHC_PPS
Medicaid_Users	Pearson Correlation	1	.835	.903*
	Sig. (2-tailed)		.078	.036
	N	5	5	5
Cost_per_Patient	Pearson Correlation	.835	1	.989**
	Sig. (2-tailed)	.078		.001
	N	5	5	5
FQHC_PPS	Pearson Correlation	.903*	.989**	1
	Sig. (2-tailed)	.036	.001	
	N	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Summary

The section presented data for type 2 diabetes and hypertension patients, grant fund allocation, cost per patient, Medicaid patients, and FQHC PPS reimbursement rates. The result of the analysis indicated that the number of diabetes and hypertension patients supported by FQHCs increased constantly over the years. Moreover, treatment cost per patient also increased across the years with the highest amount recorded in 2020. Additionally, the number of patients with Medicaid was noted to have been increasing through the years except for 2020 where there was a drop. Similarly, the results on grant funds allocation showed a consistent rise from 2016-2019 followed by a slight drop in 2020.

The finding implies that increase in the number of patients was accompanied by rise in the amount of funds released for FQHCs. This is evidence by the result which compared diabetes patients and hypertension patients with allocation of grants funds and showed a positive correlation. In demographics, the result showed that Native Hawaii and African American patients did not significantly influence grant allocation to FQHCs, but patients of the other ethnicities had a significant impact. The findings also showed a constant increase for cost per patient and for the FQHC PPS reimbursement rate from 2016-2020.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The main purpose of this study was to determine the relationship between the number of patients with hypertension and type 2 diabetes and grant fund allocations to FQHCs. In particular, the study assessed whether there is a need to increase grant funds allocated to FQHCs to enhance access to high-quality care. The present study adopted a quantitative research approach involving collecting and analyzing secondary data from HRSA. For this study, only data about FQHCs concerning type 2 diabetes and hypertension management was collected for analysis and interpretation.

After analysis, the research questions which were developed at the beginning of the study were all answered. Concerning the first research question, the obtained results showed a significant positive correlation between allocated grant funds to FQHCs and the number of patients with type 2 diabetes. For the second research question between hypertension and allocated grant funding to FQHCs. As a result, it was realized that resources assigned for chronic diseases in FQHCs have been expanded to ensure most affected patients get adequate care and treatment.

The third research question was looking for a correlation between patient demographics and the allocation of grant funds. In general, it was realized that ethnicity, age, and gender all have positive correlation with allocation of funds thereby revealing that an increase in patients based on any demographic factor leads to corresponding increase of allocated grant funds for FQHCs. For ethnicity, it was realized that while Latino, Non-

Hispanic white, Asian, and American Indian demonstrated significant increase in allocated grant funds, African Americans and Native Hawaii did not exhibit significant increase in grant funds. In this regard, it was realized that there are biased practices on grant fund allocation based on ethnic background. The final research questions the results showed a positive statistically significant correlation between FQHC PPS and cost per patient.

Interpretation of the Findings

Trends for Patients with Diabetes and Hypertension Served by FQHCs

The results indicated a constant increase in the number of patients with type two diabetes as well as those with hypertension from 2016-2020. The implication of the finding is that diseases requiring special treatment have been on the rise. Therefore, as life progress and health complications increase there is likelihood of more people being diagnosed with type 2 diabetes and hypertension. The rising trend determined in this study is consistent with the submission by McMullen and Katz (2017) who noted that chronic diseases have been on an upward projection for about 10 years.

Based on the current findings, it can be concluded that the uptrend in chronic diseases has continued and is most likely to increase in the later period. The findings are further consistent with that of Raghupathi and Raghupathi (2018) who also pointed out that chronic diseases have continued to increase over the years. As such, it appears like the nation is losing the battle of reducing the prevalence of conditions such as diabetes

and hypertension. The trends point to increased healthcare expenses in the management and treatment of chronic diseases in the country.

The findings confirmed the findings from NACHC (2021) which showed that about 80% of the general population consists of people that are uninsured or publicly insured. This means that majority of patients with hypertension and diabetes opt for healthcare services from FQHCs. According to Rodis et al. (2017), and Wood et al. (2014) and FQHCs are funded by HRSA, and the health centers have advanced in managing chronic diseases for the less privileged patients in the community, and more patients with diabetes and hypertension are seeking care from FQHCs.

Trends for Treatment Cost per Patient

The results indicated that treatment cost per patients has adopted a rising trend since 2016 with the highest values recorded in 2020 during the pandemic. Although technological advancement in healthcare is expected to reduce costs of treatment, the current revelation points out that the expenditure on a single patient has been on the rise since 2016. The findings are consistent with the report by CDC (2020) who indicated a constant increase in the cost for treating one patient from 2007-2018.

Specifically, the treatment cost rose from $562 in 2007 to $990 in 2018 for health centers (CDC, 2020). Notably, the evidence confirms the current findings since the rising costs noted by CDC included all patients served in FQHCs. The finding shows that the increase in cost per patient has continued beyond 2018 into 2020. As the number of diabetes and hypertension patients have been increasing in FQHCs, the cost of care has

followed suit. This means that the approximated spending for FQHCs by the government should have increased over the same period.

Moreover, the burden on the health centers has subsequently increased which called for more funding to keep up with the demand. However, according to NACHC (2021), FQHCs operate with lower margins compared to hospitals. The situation was further confirmed by Ly and Cutler (2018), who also observed that the health centers had a lower margin of operation. Compared to the current results, it can be noted that FQHCs must be plagued with deficits which points to a problem of underfunding.

Trends of Patients with Medicaid

The results for patients with Medicaid from 2016-2020 revealed a general uptrend up with a slight decline in 2020. The result implies that over the years, the cost of living as well as that of healthcare has become expensive hence making more people depend on federal funds for healthcare. An increase in the annual number enrolled into Medicaid points to the fact that many are becoming underinsured and uninsured thus dependent on FQHCs for primary care services even in cases of chronic conditions such as diabetes and hypertension.

The findings are consistent with the data from NACHC (2021) which showed that about 48% of the population was under Medicaid coverage. The rise in Medicaid beneficiaries can be attributed to the ability to cover for care needs of chronic diseases such as type 2 diabetes and hypertension. Based on the earlier research by Xu et al. (2018) and Young et al. (2019), a significant percentage of people with Medicaid have

chronic conditions including heart issues and diabetes. Therefore, it is possible that the observed constant rise in the annual Medicaid coverage is motivated by the increasing chronic cases and hence higher costs of treatment and management.

The sentiment is supported by the submission by McMullen and Katz (2017) who stated that about 3.5 million people who have Medicaid coverage also had type 2 diabetes while more than 16 million had history of various cardiovascular illnesses. In that respect, Medicaid has become beneficial to majority of the less privileged who have lost regular insurance coverage and yet needs access to chronic disease management and treatment. In the current context, Medicaid enrolment has benefited many people who have had the opportunity to receive healthcare services at FQHCs.

Trends for Grant Funds Awarded to Federally Qualified Health Centers

The results about the grant funds awarded to Federally Qualified Health Centers from 2016-2020 revealed a general downtrend especially from 2017. The data showed that the amount awarded has been shrinking with time which points to the federal government's effort to contain the expenditure on healthcare services for the uninsured and underinsured patients. The finding implies that the level of benefits received by the increasing number of patients in the Medicaid program has been dwindling. Lower rate of funding in the sight of increasing dependents translates to decline in care qualities in the FQHCs. This is because the health centers are not getting enough funds from the Federal government to pay for the increasing cost of treatment of both normal and chronic conditions.

The finding is consistent with that of McMullen and Katz (2017) who pointed out that despite an increase in cases of chronic diseases, Medicaid funds have only expressed minor increase. In that respect, it has become difficult to control the diseases due to the inability to meet incurred costs. Based on the research by Wang et al. (2018), strategies such as FQHC PPS are means developed by the Congress to contain costs for Medicaid beneficiaries. This explains why there has not been concurrent increase in funding Medicaid regardless of rise in beneficiaries over the years. Notably, the plan is to be able to serve more people with even smaller budgets each year in FQHCs under Medicaid. Lipson et al. (2019) and Olson et al. (2021) who highlighted the value-based care approach in the United States, developed to realize improved health outcomes at a lower cost. In that respect, the observed annual decrease in Medicaid grant fund allocation is economically justifiable as it is aimed at sustainability of affordable healthcare.

Relationship between Type 2 Diabetes Patients and Allocation of Grant Funds

The result for the relationship between type 2 diabetes and allocation of grant funds revealed a significant positive correlation. This meant that an increase in the number of patients in need of diabetes management treatment led to significant additional funds provided to FQHCs to cover the costs as revealed by increase of allocated grant funds from 2016-2020. The implication of the result is that the resources assigned for chronic diseases in FQHCs have been expanded by FQHCs to ensure they meet the increasing demand for diabetes management services among patients. The finding is consistent with that of Bryce et al. (2017) and Dobbins et al. (2018) who indicated that

diabetes control is among core clinical measures supported by federal government to improve positive outcomes.

The evidence shows that the continuous increase of allocated grant funds reflects the increasing costs of caring for chronic conditions such as type 2 diabetes. The obtained result showing positive relationship between number of diabetes patients and grant fund allocation is also consistent with the views of Rothkopf et al. (2018), who argued that the services offered at FQHCs were efficient due to availability of resources needed to care for patients. The obtained result is also like that of Myong et al. (2021), who noted that there was increased funding for FQHCs which resulted in expansion of local capacities and quality of care. Based on the result, it is realized that number of diabetes patients has a significant impact on how the federal government allocates grant funds to FQHCs to ensure chronic illnesses are comprehensively managed and the population can access the services.

Relationship between Hypertension Patients and Allocation of Grant Funds

From the results, hypertension cases and allocation of grant funds exhibited a positive relationship which was statistically significant. The finding implies that the constant rise in the number of people suffering from the heart condition was a significant factor in the determination of the FQHC funding. The finding showed that grant allocation increased each year to correspond with the increase in number of patients developing hypertension and served in FQHCs. The finding is consistent with the submission in the NACHCs Report (2015) whereby it was explained that Congress

integrated the Prospective Payment System (PPS) which assigned fixed pre-established amounts for healthcare services in FQHC. In this respect, the patients were only expected to pay for certain services and the remaining costs were covered through federal grants.

In this respect, while the costs incurred by patients remained constant, those of federal grant funding increased to reflect the additional patients served under FQHCs. The result is also consistent with the views of Niazi et al. (2021) who indicated that the PPS has ensured patients only pay for services received during their visits to hospitals which lowers the overall treatment costs. In that respect, it can be argued that increase in grant fund allocation has been crucial in enhancing the quality-of-care services for hypertension patients. Meanwhile, the result showing that the correlation between hypertension and grant fund allocation is statistically significant is supported by the submission of Wright and Nice (2014), who noted that financial support for FQHCs was linked to the outcome of chronic diseases.

In that respect, it is realized that the determinants of grant fund allocation for FQHC are linked to the number of cases of hypertension as a chronic condition in the facilities. In line with the current research question, the results obtained alongside the existing literature evidence helped reject the null hypothesis that there is no statistically significant association between number of hypertension patients and the allocation of grant funds for FQHCs.

Relationship between Patient Demographics and Allocation of Grant Funds

The demographics considered by the research included gender, ethnicity, and age of patients. From the Pearson correlation analyses performed, the result revealed that all the demographics were positively associated with allocation of grant funds. The finding implies that the type of people with chronic illnesses had positive impact on the amount allocated by the Federal government in FQHCs. However, it was realized that while Latino, Non-Hispanic white, Asian, and American Indian patients with chronic illness led to significant increase in grant funding of FQHCs, there was an insignificant increase in funding for Native Hawaii and African American.

The findings revealed that the United States is still affected by ethnic discrimination in terms of allocation of grant funds depending on the affected ethnic group. The obtained results were like those of Capp et al. (2017) and Gao et al. (2017) who argued that the quality of services received by patients in FQHCs was dependent on demographic characteristics. The results contrast those of Xing, Goehring, and Mancuso (2015), who contested that demographic characteristic did not have significant impact on health outcomes in FQHCs. Nonetheless, from the obtained findings, it is realized that policies related to allocation of grant funds to FQHCs should be reviewed to ensure there is no discrimination based on ethnicity and that patients from different background have an equal access to care. Regarding the third research question, the association between patient demographic characteristics and allocation of grant fund has a statistical significance.

Limitations of the research

The analysis depended on secondary data from HRSA which focused on FQHC grant funds as well as statistics on number of patients with diabetes and hypertension. A key limitation of the data analyzed is that it does not reveal the full picture on the reason for rising cases of hypertension and diabetes under FQHCs. At the same time, the quantitative data cannot be flittered by patients who have Medicaid and patients diagnosed with hypertension or type 2 diabetes, therefore this study could not analyze the relationship between the increasing number of patients with type two diabetes or hypertension and the Federally Qualified Health Center Prospective Payment Systems Reimbursement rate.

Recommendations

A major recommendation is that future studies should utilize qualitative methods such as interviews to obtain in-depth understanding of the challenges faced by patients with type 2 diabetes and hypertension. Future studies should also obtain data that can determine the number of patients with a FQHC PPS reimbursement rate who have either type 2 diabetes or hypertension. In addition, future studies should explore the viability of implementing preventive programs for chronic illnesses such as diabetes and hypertension to minimize the rising demand for care within FQHCs. The current study showed a disparity in grant fund allocation based on ethnicity. Therefore, future studies should analyze how fairness in awarding medical grant funds can be promoted among various demographics.

Implications for Professional Practice and Social Change

Professional Practice

A major recommendation for professional practice is that the United States department for health needs to implement programs to increase awareness on prevention of type 2 diabetes and hypertension among the public to curb the rising cases related to the two diseases. At the same time, the results showed that as the number of chronic diseases such as type 2 diabetes and hypertension have continued to rise from 2016-2020, however, the federal grant funds allocated to FQHCs has also risen. In this regard, the federal government needs to implement policies to ensure that the grant funds allocated to FQHCs are effectively used to support diabetes and hypertension patients. In addition, the issue of ethnic bias in allocation of grant funds should be investigated and suitable policies implemented to ensure equality in accessing FQHCs regardless of the patients' ethnic background.

Potential Social Change

The current research can be used to promote social change by raising awareness on the increasing incidents of chronic illnesses such as hypertension and diabetes in the United States. The results can be used as evidence to create programs that educate the public on healthy lifestyles to prevent development of diabetes and hypertension. The goal in such cases is to ensure a healthy population as well as minimize the expenses incurred by government through grant funds towards FQHCs.

Additionally, the evidence from this study can be used to promote social change by using it to start the dialogue of unequal access to quality healthcare by individuals from different ethnic backgrounds. The dialogue can help to understand how minority groups such as African Americans and Native Hawaii can be supported to ensure they also access high quality care from FQHCs like individuals from other ethnicities. Moreover, the evidence from this study showing rising healthcare costs can be used to promote social change by initiating discussion on the need for amendments of legislation regarding payments of healthcare to ensure more low-income people can afford treatment.

Conclusion

The main aim of the research was to investigate the relationship between grant fund allocation and the number of patients with hypertension and type 2 diabetes under the FQHC program. In particular, the study sought to assess whether there is a need to increase grand funds allocated to patients with hypertension and diabetes to enhance their access to high-quality care. On this note, the current study pursued three specific objectives. Firstly, the research examined the number of patients with type 2 diabetes seen at FQHCs and allocation of grant funds from the year 2016 – 2020.

Based on the results, the chronic illness has been on the rise for the last decades and is more likely to increase in the future. It emerged that the rise of diabetic illness among other chronic illnesses resulted from ineffective measures and interventions and the country is not in a better position to manage the rising case of diabetes and

hypertension. Moreover, it was realized that the capacity of FQHCs to provide high quality care to patients from vulnerable communities is reducing due to increasing demand and reduced grant funding from federal government. The research explored treatment costs associated with managing patients with chronic illnesses. From the findings, the treatment cost per patient with chronic illness has continued to increase significantly.

The high cost of treatment has been attributed by adverse economic factors that have resulted to high inflation rates. The results indicated that the rise in costs of treatment has burdened the patients and the healthcare facilities. Health centers have called for more funding to keep up with the demand for patients with chronic illnesses. As such, there is the likelihood that FQHCs experienced deficits in the budgetary allocations. Based on the obtained results, it can be ascertained that healthcare facilities need to opt for technological advancements aimed at decreasing the costs of treatment and management of patients with chronic illnesses.

For the second objective, the relationship between hypertension and allocation of grant funds were assessed. The results showed a significant positive correlation between hypertension and grant funds from the findings. However, there still is an urgent need to increase the Medicaid funding to improve the wellness of patients with hypertension. Finally, the research investigated the link between patient demographics and the allocation of grant funds. It was realized that while Latino, Non-Hispanic white, Asian, and American Indian patients with chronic illness led to significant increase in grant

funding of FQHCs, there was an insignificant increase in funding for Native Hawaii and African American. The obtained results were also noted to reject all the four null hypotheses developed at the beginning of the research.

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