Chronic Kidney Disease in El Salvador

Skye Guerra FNP-BC

Dominican College

Abstract

This paper will discuss Chronic Kidney Disease (CKD) in El Salvador and its significance as a global health issue. A literature review will be summarized on five research articles associated with this global health issue and its development and possible causes among the population in EL Salvador. An overview of an action plan to assist with eradicating this global health issue and description of methods for implementation will be discussed. Explanation of strengths and barriers of this implementation as well as future recommendations will be discussed. Lastly, role of Doctor of Nursing Practice (DNP) will be described in relation to this global health issue.

Introduction

El Salvador is located in Central America. It is the smallest Latin American republic and the most densely populated; overpopulation is a critical problem. The majority of the population is of mixed indigenous and European descent. Spanish is the official language. El Salvador population density is 293.3 people per square kilometer as of October 2018. This mountainous country is surrounded by Guatemala and Honduras and as well as the Pacific Ocean. It is known as the Land of Volcanoes, due to its frequent earthquakes and volcanic activity (WHO, 2018).

Statistics

According to the WHO, 2018 the total population in El Salvador as of 2016 is 6,345,000. Gross national income per capita (PPP international $, 2013) is seven. Life expectancy at birth males 69 and females 78. Probability of dying between 15/60 years old is 261 males and 103 females per 100,000. Total expenditure on health per capita (Intl $, 2014) is 565. Total expenditure on health as % of growth domestic product (GDP) is 6.8% (WHO,2018).

Morbidity and Mortality

In rural areas, where an estimated 37.3% of El Salvador's population lives, gross domestic product (GDP) per capita is only one third of that in urban areas, the literacy rate is almost 20% lower, life expectancy is six years shorter and the rate of chronic and global malnutrition is twice as high. Life expectancy at birth in El Salvador is currently estimated at 72 years (Who,2018).

Non-communicable diseases and injuries have increased at a staggering rate. While in mostly deprived areas illnesses associated with poverty and underdevelopment still prevails. Coordination between the public service providers is poor or inexistent; access to health services is limited. Half of the population that suffer from injury or illness receive medical assistance.

Since health care spending is low, allocation of resources amongst public health institutions is inadequate and the quality of care provided to citizens is poor. Limited access to drinking water and basic sanitation together with malnutrition, environmental pollution and degradation are the primary causes of illnesses. According to the World Health Organization (WHO) 35% of households remain in extreme poverty with limited access to health services and education (WHO,2018).

According to the World Bank (2018) El Salvador continues to suffer from persistent low levels of growth. Agriculture, livestock, forestry, and fisheries, manufacturing and mining, commerce, restaurants and hotels accounted for about two-thirds of the observed gross domestic product (GDP). Between 2010-2016 GDP growth averaged 2.6%, making the country one of those with lowest growth in the Central American region (World Bank, 2018).

The quality of life of citizens in El Salvador is greatly threatened by the increased violence and crime rate. This has a negative impact on social and economic development. The crime rate reached historic record levels in 2015 with 102 homicides per 100,000. Crime and violence make doing business more expensive, negatively affect investment decisions and hinder job creation. In addition, the vulnerability of the country to adverse natural events, exacerbated by environmental degradation and extreme climate variability, also undermines its long-term growth trajectory and sustainability (World Bank,2018)

Health Disparities

El Salvador is highly vulnerable to natural disasters, such as tropical depressions (heavy rains and flooding) and severe droughts, which impact infrastructure and real sectors, such as agriculture, and have significant effects on health and food security. Coronary heart disease is the

leading cause of death in the relatively small country, which has less than seven million citizens. The next leading causes of death include influenza, pneumonia, kidney disease, liver disease and lung disease. El Salvador has a relatively high number of healthcare workers but is still not able to meet the needs of the population with its current healthcare system and the unequal distribution of healthcare workers at different levels of service. (Ray, 2017). For the purpose of this paper the main global health issue (GHI) that will be focused on is Chronic Kidney Disease.

Literature Review

Chronic Kidney Disease (CKD) has emerged as a global public health burden for several reasons, including an increasing number of patients, progression to end stage renal disease (ESRD), high costs to public health systems and its morbidity and mortality, particularly associated to cardiovascular disease. During the last two decades there have been reports of excessive prevalence of CKD in the Pacific coast of Central America, mainly from El Salvador, Nicaragua, Guatemala and Costa Rica. In El Salvador, CKD is the second cause of hospital mortality and the first cause for males only. A 50% increase in hospitalization rate for CKD was noted from 2005 to 2012. Despite being a major public health issue, there is no surveillance system capable of detecting CKD at any stage. In addition to the well-known causes of CKD-diabetes and hypertension- a new form of CKD named Mesoamerican nephropathy (MeN) or chronic kidney disease of undetermined cause (CKDu) is responsible for many cases in the country, mainly young male workers from the specific coastland (Flores, et.al, 2017).

The articles reviewed for this project focused on chronic kidney disease in El Salvador. In the first article entitled: “Prevalence and association of chronic kidney disease, diabetes, hypertension, and hyperuricemia in an adult urban population of El Salvador” by Flores et.al.,

2017. The authors purpose for writing this article was to determine the prevalence of CKD, diabetes, hypertension and hyperuricemia and associations to CKD in an urban adult population. A representative sample of 150 adults form an urban community in San Salvador was randomly selected. Gender, age, educational level, income, tobacco smoking, alcohol consumption, analgesic use, hypertension, diabetes, and hyperuricemia were evaluated predictors of CKD. From all predictors, only diabetes, hypertension, and hyperuricemia showed increased risk for CKD (Flores, et.al, 2017).

The second article is entitled: “Chronic Kidney Disease Epidemic in Central America Urgent Public Health Action Is Needed amid Causal Uncertainty” by Ordunez, et.al., 2014. In this article the authors discussed Chronic Kidney Disease to be occurring in clustered farming communities traditionally burdened by socioeconomic disadvantages from northern Nicaragua, the Pacific Coast of El Salvador and other countries such as Costa Rica, Guatemala, Honduras and the South of Mexico. The authors revealed this disease mostly affects young adult male agricultural workers, e.g. sugar cane cutters. The high prevalence of CKD in these countries has been attributed to misuse of pesticides. Another possible contributing factor are the harsh working conditions, especially regular exposure to very hot temperatures and extreme physical effort, leading to heat stress and dehydration. Along with exposure to pesticides, these seem to play and important role in the occurrence of the disease, particularly among sugar cane workers. The study also revealed other possible causes, such as NSAID use, alcohol and sugary beverage consumption have been associated with the disease. This study concluded the potential role of heavy metals and contamination of fertilizer, as well as exposure to infectious diseases such as Leptospirosis, and Dengue, which are prevalent in the region can play a role in CKD (Ordunez,et.al., 2014).

The third article reviewed entitled: “The epidemic of chronic kidney disease in Central America” by Ordunez, 2014. This article was congruent with the previous article reviewed. The causes of CKD are unclear, but author believed it is relevantly caused by social, environmental determinants. These include exposure to pesticides, heat stress, with recurrent dehydration, and excessive intake of high sugar drinks. This study concluded that it is important to treat the affected people as well as regulate the underlying cause (Ordunez, 2014).

The Fourth article reviewed entitled: “Occupational Heat Stress and Kidney Health: From Farms to Factories” by Nerbass et.al, 2017 discussed the prevalence of CKD in El Salvador being more prevalent among sugarcane workers in the hottest Pacific lowlands at 18% compared with 1% in communities at higher cooler elevations. It was suspected that pesticides used in sugarcane production might be implicated in this epidemic. In this study kidney function was compared between the two groups of lowland and highland sugarcane workers It revealed the lowland workers were 10 times more likely to demonstrate elevated serum creatinine. Sugar cane harvesting usually involves 4 to 12 hours of uninterrupted intense physical exertion. Fields are usually burned the night before harvesting, and workers entering this heated environment quickly become coated in soot, which further impedes cooling. Although workers can take water breaks, payment is based on the amount of cane cut, and several studies show workers exhibit signs of dehydration. The authors concluded that dehydration is not risk factor for CKD, but dehydration is well known to adversely affect kidney function. Dehydration increases urinary concentration secondary to an increase in serum osmolarity due to the loss of body water. This study concluded, chronic or repeated episodes of heat stress accompanied by water solute loss can cause repeated subclinical ischemic kidney injury, which over time may lead to permanent damage and CKD (Nerbass, et.al., 2017).

The fifth and final article for this literature review is entitled: “Hyperuricemia- associated Mesoamerican Nephropathy: Case Report and Review of Literature” by Atanda et.al., 2018. The author discusses the same risk factors to CKD as the above articles revealed. The author presented a case study of a 41year old man with history of hyperuricemia and gouty arthritis. He worked as agricultural field laborer and truck driver in El Salvador for six years before immigrating to the United States. This study concluded accurate history and physical taken by the healthcare provider is important for accurate diagnosis of CKD. Mesoamerican Nephropathy (MeN) formerly called Chronic Kidney Disease of un-determinate (CKDu) that presents in young agricultural workers in Central America and other tropical parts of the world, in the absence of clear etiology. Most patients have a history of physically demanding work in a hot climate. Although the development of MeN is still unclear, hard physical work in hot climates appears to be the main important risk factor. It is surmised that the most likely cause of MeN is repeated episodes of acute kidney injury related to dehydration, loss of minerals, hypovolemia sometimes accompanied by rhabdomylosis, systemic inflammation, use of NSAIDs, and oxidative injury. CKD may arise from repetitive episodes of acute kidney injury (Atanda, et.al., 2018).

Action Plan

Chronic kidney disease will never be fully eradicated from the population of El Salvador. Agriculture and farming for most of them is a way of life. Implementing plans for preventing and managing the disease is by response at the first level of care. First response is identification and monitoring of people at risk. Second, early detection of the disease. Third, integrate management of CKD, diabetes and hypertension. Lastly, provide training for personnel (health teams, employers, and workers) and include relevant risk factors for CKD.

In El Salvador presently, the organizations working towards developing strategies for identifying those affected by CKD are the World Health Organization (WHO), Pan American Health Organization (PAHO), and the Worker Health and Efficiency Program. Pan American Health Organization (PAHO) and World Health Organization (WHO): advocates improvement in environmental and occupational health, promote resource mobilization and provide technical support to improve surveillance of CKD (paho.org) Worker Health and Efficiency program: implemented to improve working conditions of sugarcane cutters and reduce risk factors of CKD. It includes frequent breaks in shade areas, access to safe drinking water, proper hydration, avoidance of extreme labor, and lowering of uric acid (Obrador & Kottgen, 2017).

Summary

The strength of this action plan is the number of health organizations willing to eradicate this health issue. The most common barriers will be poor continuity of care, inadequate understanding/education about CKD, and feeling unwell. Other barriers are associated with a failure to receive items of recommended care and inadequate support from family and friends, conflicting advice from and poor communication amongst specialists, and the effect of co-morbidities on self-management and lack of motivation to care for oneself. To be successful long term is to continue educating patients about the effects of CKD and how to take preventative measures. This should be started in our homeland of the United States. According to Lesser, & Batalova out of the 3.385,000 immigrants documented in the United States, originating from Central America, 1352,000 make up the population of Salvadorans that have immigrated to the United States. Preventative measures at home will increase patient compliance back in their own country and help those that suffer from this global issue.

DNP Role

My role of the DNP for this project is a Nurse Leader. A nurse leader is key to help an organization prepare for and lead change. Nurse leaders must model the role of change agents and lead by example in change implementation demonstrating equanimity. An effective change agent is disciplined, thinks rationally with an open mind, and is informed by evidence (Oulton, 2014). Evidence-based practice (EBP) drives today's healthcare environment, and nursing practice in particular, and must be the framework for frontline nurses to begin prevention, early recognition, intervention and implementation of practices and programs to address global health issues (GHIs). Support of nurse leaders for implementation of these practice innovations is crucial to establish an environmental culture that adopts and values EBP (Clement-Obrien, et.al., 2011). Administrative support is also critical to gain the trust of frontline nurses as they embark on a journey of change that will positively impact GHIs they face in practice on a daily basis. Being a global leader requires an understanding of the wider context; it means having a view greater than the local perspective and realizing connections and relationships that exist globally. The role of the nurse leader has to expand beyond the walls of hospitals and other healthcare settings if we are to successfully impact the fight against emerging GHIs. Nurse leaders are also instrumental in facilitating change within the community and should seek such opportunities. For example, by becoming a member of a local board, the contribution of nurses and nursing is represented at community tables and can positively impact change that reaches far beyond traditional healthcare delivery settings (Edmundson, et. al., 2017).

Conclusion

In conclusion, Advanced Practice Nurses (APRNs) are at the forefront of patient advocacy, and health policy implementation. The burden of Chronic Kidney Disease is rising

both in this country and worldwide. Reducing CKD requires systematic, interdisciplinary approach to care. The greatest opportunities to reduce the impact of CKD arises with early detection and surveillance especially in the primary care setting. APRNs are well positioned to facilitate the implementation of collaborative care to eradicate Chronic Kidney Disease.

References

Atanda, A., Henry, J., Samuel,G., Fadiran, O., Frederick, C., Oluwatesin, O., Idowu, K., and Mere, C.C. (2018). Hyperuricemia-associated Mesoamerican Nephropathy: Case Report and Review of Literature. *Cureus 10* (9): e3282. DOI 10.7759/cureus.3282

Clement-O'Brien, K., Polit, D. F., & Fitzpatrick, J. J. (2011). Innovativeness of nurse leaders. *Journal of Nursing Management*, *19*(4), 431-438. doi: 10.1111/j.1365-2834.2010.01199.x

Edmonson, C., McCarthy, C., Trent-Adams, S., McCain, C., Marshall, J., (2017) Emerging Global Health Issues: A Nurse's Role *OJIN: The Online Journal of Issues in Nursing* 2 (1) doi**:**10.3912/OJIN.Vol22No01Man02

Flores, M., Rodriguez, j., Delgado, A., Garcia-Trabanino, R. (2017). Prevalence and association of chronic kidney disease, diabetes, hypertension, and hyperuricemia in an adult urban population of El Salvador. *Journal of Nefrologia Latinoamericana 14* (4) 137-143. retrieved from: http://doi.org.10.1016/j.nefrol.2017/.09.001

Lesser, G & Batalova, J. (2017). Central American Immigrants in the United States. *Journal of Migration Policy Institute* retrieved from: http://wwwmigrationpolicy.org

Nerbass, F., Petcoits-Filho, R., Clark, W., Sontrop., J., Mcintyre, C., and Moist, L. (2017). Occupational Heat Stress and Kidney Health: From Farms to Factories. *Kidney International Reports 2* (6) 998-1008. Retrieved from: https://doi.org/10.1016/j.ekir.2017.08.012

Obrador,G., & Kottgen, A. (2017). Genetic and environmental risk factors for chronic kidney disease. *Kidney International Supplements 7* (2) 88-106 retrieved from: http://doi.org/10.1016/k.kisu.2017.07.004

Ordunuz, P., Martinez, R., Reveiz, L.., Chapman E., Saenz C., Soras da Silva, A., and Becerra, F. (2014). Chronic Kidney Disease Epidemic in Central America: Urgent Public Health Action Is Needed amid Casual Uncertainty. *PLOS Neglected Tropical Diseases 8* (8): e3019.doi: 10.1371/journal.pntd.0003019.

Ordunuz, P., (2014). The epidemic of chronic kidney disease in Central America. *Lancet 2* retrieved from: http://www.lancet.comlancetgh

World Health Organization. Non-Communicable diseases (NCD) Country Profiles, 2018 retrieved from: http://www.who.int/en/

The World Bank in El Salvador Retrieved from: http://www.worldbank.org

Ray, E. (2017). Top diseases in El Salvador. Retrieved from: http://www.borgenproject.org

Stanifer, J. Muiru, A., Jafar, T., and Patel, U. (2016). Chronic Kidney Disease in low-and-middle income countries. *Nephrology Dialysis Transplant 31* (6) 868-874. Doi:10.1093/ndt/gfv466.

Oulton, J. A. (2014). Leading nursing globally. *Health Emergency and Disaster Nursing*, *1*, 29-33.