IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 6, Issue 6 Ver. VII. (Nov.- Dec .2017), PP 01-09
www.iosrjournals.org

Comorbidity of Diabetes And Hypertension And Available Management Strategies In Eastern African Region

Marwa, Immaculate[1]; Gugu Gladness[2]; Mtshali, Gloria[3]
[1]*Department Of Community Health Nursing ,Kenyatta University-Kenya*
[2, 3] *Department Of Nursing And Public Health, College Of Health Sciences, University Of Kwazulu Natal-South Africa*
Corresponding Author: Marwa, Immaculate1

Abstract: *The emergence of chronic conditions is a global burden, affecting the socioeconomic aspects of development and health care services delivery. Comorbidity of chronic conditions has been found to be associated with increased health care costs, poor quality of life due to increased poverty levels. Lack of government prioritization and implementation of health promotion, screening and treatment of chronic conditions services in PHC lead to increased burden of health care service provision within resource constrained areas. However, limited literature exists and gives statistics on how health facilities are coping up. Analyzing available literature would be useful in efforts to explore and establish information on the magnitude, what has been done by government in primary health care in the region and what is yet to be done to curb this fast growing disease burden. The thrust of the review sought to summarize the burden of comorbid diabetes and hypertension in Eastern African region, receiving chronic care in primary health care settings. The level of control reported among patients with comorbid diabetes and hypertension and treatment challenges and strategies currently used from the perspectives of the patient and the health systems. The results are an important implication to creation and adoption of improved policies, interventions and an understanding on the factors that affect the management of comorbid diabetes and hypertension.*

Keywords*: Co-morbidity, Eastern Africa region, Hypertension and/or diabetes, Primary health care, optimal control,anagementstrategies*

Date of Submission: 25-08-2017 Date of acceptance: 14-12-2017

I. Introduction

Diabetes mellitus and hypertension have emerged as major medical and public health issue for cardiovascular diseases. Hypertension is said to affect about one billion people worldwide and the figure is estimated to rise to 1.56 billion by 2025,[1]. On the other hand, the estimated number of people living with diabetes in Africa is currently 12.1 million, with a recent projection showing that, the number will reach 239 million by 2030 [2]. According to International Diabetes Federation estimates for 2012, it is approximated that 80% of those affected by diabetes are in Sub-Saharan Africa, and 81.2% of the cases are undiagnosed or are not aware they have diabetes [2]. Recent studies have shown that, up to 75% of adults with diabetes also have hypertension in USA alone and patients with hypertension alone often show evidence of insulin resistance[3]. In most developing countries it is estimated that comorbid diabetes and hypertension is a 40-60% among patients with chronic diabetes and hypertension affecting the most productive age groups of below 60years of age [1]. The disease may precede diabetes mellitus, be diagnosed at same time as diabetes or may be as a result of diabetic nephropathy. With a global shift from communicable disease to non-communicable disease and from premature death due to years lived with disability [4], Sub-Saharan Africa where Eastern Africa countries exist lacks literature on treatment outcomes of patients with comorbid hypertension and diabetes mellitus especially in primary health care settings(PHC). One of the elements of African community integration is the social development dimension, where development of programs of health cooperation is given first priority among economic and political dimensions [5]. Thus there is a dire need to undertake studies to be able to analyze current intervention strategies for the management of comorbid diabetes and hypertension on management at PHC settings. Identify factors affecting management of comorbid diabetes in primary health care settings and explore the role of belief system in the management of these conditions with the overall aim of improving the quality of care and health outcomes for people with comorbid diabetes and hypertension.

This occurrence is the greatest contributor to increased morbidity, multimorbidity and mortality in macro-vascular and micro-vascular events. Type 2 diabetes mellitus and poor glycemic control also adversely affects health outcome[6]. The high prevalence of Non-communicable diseases (NCDS) is closely linked to rapid cultural and social changes, ageing populations, increasing urbanization, unhealthy eating, reduced

physical activity and societal stress [7]. The sociocultural factors have been found to have a tall on adherence to treatment and health seeking behaviour and practices among patients with chronic diseases[8, 9] yet these factors have been taken lightly in clinical practices and research studies, leading to poor adherence and health outcomes.

1.1 Definition of Co-morbidity

Comorbidity has a myriad of definitions especially in health care, but the commonly acceptable definition is the presence of one or more disorders in addition to the index disorder or diseases[10]. Alternatively it is the presence of two or more conditions simultaneously in one person, with no special regard to their pathology or being interdependent with each other [11]. In this literature review, concentration is on comorbidity of diabetes and hypertension regardless of whether diabetes or hypertension is the primary disorder. Diabetes mellitus and hypertension are commonly known as concordant co morbid conditions, although at some point can occur independently [12]. Comorbidities can have profound effects on patients' ability to manage their self-care and comorbid illnesses can sap the financial resources of people with diabetes by increasing their out-of-pocket costs for medical care[13].Health care systems in developed and developing countries have a huge responsibility of health service delivery to people with comorbid or multiple chronic conditions, who are prone to increased utilization of health care services [10]. Lack of adherence to clinical guidelines by health care providers on management of comorbid conditions has been found to be a factor [14, 15]. Currently most health systems are acutely understaffed by medical personnel and sub-Saharan region faces the worst shortage among developing countries [16], where patients' provider ratio is still below the minimum requirement by the[17]. In Sub-Saharan region availability of health resources at primary health care facilities in response to chronic care is a challenge, according to [18] recently, most health systems have barely been meeting the minimum requirements and medical supplies as ascertained[19]. Unfortunately most developing countries healthcare systems are not strengthened towards chronic care, let alone comorbid conditions, due to unfinished war with communicable diseases now coupled with violence[20]. However all is not lost as, with sustained communicable disease control, integration has the potential of closing the gap in primary health care in most developing countries and improve health outcome for the larger population [21-23].

According to [24], lack of community and household level screening , makes it hard to establish the exact burden of the comorbid prevalence or the overall burden due to NCDs. Literature has confirmed that prevention and control of NCDs can perfectly be implemented at primary health care levels with positive results [25, 26]. This calls the uplifting and strengthening services at the primary health care settings, as it stands most of them are acutely oriented and most chronic conditions go unnoticed and even screening of blood pressure and blood sugars are seldom done [25, 27]. Lack of surveillance data about the burden of NCDs and comorbidity in health systems complicates service delivery, resource allocation and mobilization and implementation of health policies [20, 28].Noteworthy most published studies in the region are cross-sectional surveys giving prevalence of single condition such as diabetes or hypertension with little report on treatment outcome and possible challenges leading to poor outcomes. Studies conducted in Kenya, Tanzania, Uganda, and Rwanda all attests to high prevalence and poor control of comorbid diabetes and hypertension, despite patients being on treatment reporting the highest prevalence of 50% 54.5% in Kenya and Uganda, while Tanzania reporting 34% level of control of diabetes as compared to 30% in Kenya [29-31]. However there is paucity of evidence on available intervention strategies which cut across provider and patients factors leading to poor control of comorbid diabetes and hypertension. Despite the fact that most studies in the region tend to generalize the reason for poor level of control achieved including ethnicity and urbanization [32].

The burden of comorbid diabetes and hypertension has a major social and economic consequences and loss of productive lives in already economical fragile countries in the region. Failure to act now ,by implementing evidence centered preventive measures, will result in large increases of un avoidable morbidity and mortality, placing enormous pressures on the constrained health care systems of low income countries [33]. This realization is responsible for a growing interest on the part of practitioners and researchers on the impact of comorbidity on a range of outcomes, such as mortality, health-related quality of life, functioning, and quality of health care including self-management [25, 34].

II. Methodology

This literature review was conducted through several search engines, to collect as much as possible the scanty available literature from the East African region. The review forms a section of the PhD Thesis submitted at the University Of Kwa Zulu Natal University. The literature was obtained through the search of different databases (EBSCHOST) PUBMED, MEDLINE, Google and Google scholar, independent peer reviewed journals, and secondary materials from UN, WHO and printed government documents were consulted in this review. The search period was tagged 2008-2015, a period regarded as current for significant change in clinical conditions, but due to scarcity of literature older literatures were also consulted. Literature considered out of the

scope was used for comparison purposes only. The following Key words were used during the literature review: "co-morbidity", "hypertension and/or diabetes", "primary health care", "optimal control" Kenya, Tanzania, Uganda, Rwanda or Sub Saharan", "management strategies. "Control level". The literature review was based on the following aspects of comorbid conditions: current management strategies, factors affecting management of comorbid diabetes and hypertension and the role of belief systems in the management of comorbid diabetes and hypertension. These aspects have been explicitly discussed the context of East African health care systems and patients related factors.

III. Results

3.1 The burden of comorbid diabetes and hypertension in East African region

Despite the fact that East African Countries continue to lack data on the burden of most chronic conditions, the little available evidence from clinical studies and survey indicate that comorbidity of diabetes and hypertension is on the rise. The evidence further indicates that almost 70% of all patients receiving treatment do not achieve optimal control of either diabetes or hypertension [1]. Prevalence of co morbid diabetes and hypertension is dependent on ethnicity and rural or urban settings with urban settings reporting high prevalence than rural [8]. Despite rural prevalence being low, does not mean that the conditions are inexistence or have low impact.In a land mark study conducted in Kenya Nairobi tertiary hospital [30] found that out of 211 patients 50% were hypertensive and out of the 65% did not achieve the required level of control in spite being on treatment and only 30% of diabetes achieved HbA1c<7%. This was attributed to other lifestyle related factor like smoking, diet and obesity. According to [31] it was found out that among patients with complications such as renal failure, 90% were hypertensive 16% were diabetic with 11.5% being smokers and 71.9% had HbA1c<11g/dl. Most patients also had Anemia which increased with severity of renal failure. In Tanzania the prevalence of hypertension was 54.5%, with the 34% level of control achieved despite 81.7% being on treatment, the same poorly controlled diabetes was reported to be 76.7% out of a total of 150 participants [35], but did not report any other lifestyles factor like smoking among participants. However more studies need to be conducted clinically based on the new improved medicine for both diabetes and hypertension to ascertain reasons for poorly controlled co-morbid conditions, especially with the availability of evidence based clinic guidelines and protocols.

3.2 Current management strategies for comorbid diabetes and hypertension in PHC settings

With the global burden of NCDs and the health double burden on developing countries, prevention and control of NCDs has been advocated for by the WHO, as the litmus intervention for all NCDs (WHO, 2010). The interventions targeting common risk factors have been found to be cost effective in the long term prevention of single or co- morbid diabetes and hypertension among other conditions[25].

Prevention of risk factors in general population presents the first line intervention of comorbid conditions among other non-communicable diseases. East African countries are struggling to implement the recommendations made by international health bodies, especially the WHO, on the control of risk factors for NCDs. In the year 2007 Kenya government through the ministry of health developed and implemented the Tobacco Control Act which prevents exposure of general population to cigarette smoking[36](Ministry of Health 2007), however implementation of the law has been partial especially in rural towns as compared to Nairobi and Nakuru[20]. Other countries are still struggling with drafting and implementing partial tobacco control laws. In Uganda the tobacco laws are yet to be developed, but has tobacco regulation which bans smoking in public places [37] the same applies to Tanzania and Rwanda, where the three aspects of the framework are not fully implemented among the member state as shown in the recent update of the framework implementation[38].In a study conducted in Kenya rural setting to test the feasibility of community and household screening of diabetes and hypertension [39], found that community and household screening attained 10% and 6% among the 346 and 236 participants in community and household had higher systolic blood pressure above 160mmHg. The study concluded that community and household screening can be feasible if one encounter for confirmatory test can be done, instead of follow up confirmatory test, which had poor turn up. Similarly multi-disease screening program and community education has been successful in screening for diabetes, hypertension in an integrative program with HIV in Uganda [40], recording a community participation of 65%, but still low level of awareness of 38.2%. Community screening campaigns forms the basis for screening in the region as voluntary health seeking is seldom done by the general population. It offers patients and healthcare providers opportunities to modify long-term risks before serious complications occur and further reduce mortality rates [41].

Random screening of patients at pre-diabetes or among newly diagnosed patients has been found to be one early measure of detecting coexisting hypertension as a high risk factor among others. It is recommended that patients presenting in clinical setting should be screened for diabetes and hypertension at least twice a year according to WHO using the abnormal glucose regulation or hemoglobin testing HbA1c levels which has been

found to be more reliable in detecting onset of complications among diabetics [42], but not available in rural settings and primary health care settings. In a cross sectional study conducted in Uganda Mulago National hospital on undiagnosed diabetes and glucose intolerance among hypertensive, found that 50% of 320 participants had glucose intolerance and only 26% achieved control of glucose levels. They also found other related factors which warrant regular screening of hypertension among diabetes patients, such as family history, alcohol consumption, and physical inactivity should form patients screening information. Similar findings have also been recently reported in Kenya County hospital in central Kenya [43] where a high prevalence of Abnormal Glucose Regulation(AGR) was at 32% and 68% had done targeted screening for diabetes in hypertensive clinic. Patients with newly diagnosed diabetes mellitus usually benefit from proper glycemic control and reduction of complications while those with pre-diabetes will benefit from strategies tailored to prevent or retard onset of diabetes and associated complications. This strategy reduces health costs associated with management of their hypertensive condition and possible concurrent type 2 diabetes mellitus [43]. Inspite of continuued recommnedation from WHO on use of scrrening, Ministry of health in these countries have not developled clinical protocal for screening and how often it should be done to especially among the prediabetes or even the general population.Health literacy level among patients is one factor which determine implementation of management interventions. Studies done a cross the region indicate that increasing patient level of knowledge, could directly increase the level of adherence to treatmenet and thus level of control achieved. Knowledge of general public about diabetes and hypertesnion has been reported to be low. In a study conducted in Kenya the knowledge about diabetes was slightly above 70%, while those with no knowledge was at 27% [44]. A cross sectional survey done in Rwanda,found inadequate knowledge and poor perception towards diabetes [39]. In Tanzania the level of knowledge or awareness among the patients determined health seeking behaviour either delays or hasten it. However with increased community eduction through the media and advocacy group, positive reults have reported in East African region. However interventions aimed at comorbid conditions especially in rural communities need to be emphasised. Another strategy which is currently being utilized in the management of comorbid diabetes and hypertension is the integration of chronic conditions with managment of communicable condtions such as HIV/AIDs. In a study conducted in Kenya slum community in Nairobi, out of 2,206 particpants divided into two groups 9.5% were living with HIV for a minimum period of time between maximaml a 1.8-2.1 years. They concluded no difference in response to treatment between non HIV patients and HIV positive patients[45] other studies have reported feasibility of intergration of HIV and NCDs management in primary health care settings[46, 47], including rapid community based testing and linkaging to health facilties. An integrated approach to the prevention and management, irrespective of cause, is needed in primary health care settings. Chronic disease interventions selected for use in primary health care must lead to productive changes in risk status and outcomes, be cost effective, and be financially and logistically feasible, which are available for implementation across a range of resource settings. HIV/AIDS models have a lot of experience with activating community and peer support for patients, which can be followed in prevention of chronic diseases including hypertension and diabetes mellitus. Therefore, HIV programs can be leveraged to non-communicable disease programs, and vice versa[1].

According to [48] study, physical inactivity, inappropriate nutrition and obesity have been found to be the main risk factors of type 2 diabetes mellitus, attributable to social and technological changes over the past few decades. [3], states that lifestyle modification is said to be a primary prevention of diabetes and hypertension. This principle is also pertinent to the prevention of downstream macrovascular complications of the two disorders. Management of hyperglycemia, hypertension, dyslipidemia and the underlying hypercoagulable and proinflammatory states requires the use of multiple medications in combination. However, countless people face almost insurmountable environmental, social and financial barriers to healthy lifestyle choices on a daily basis especially among poor countries where the majority of Eastern African countries exist [49].Telemedicine which involves integration of electronic information and medical technology has been recommended as it helps bring specialized care in rural areas where specialists are few. The intervention has proven to be effective in linkage of HIV patients to care and follow-up, and in Rwanda the use of telemedicine has been tested [50] and used together with the Chronic Care Model and the WHO Health for NCDs [51, 52]. The use of mobile and modern information technology such as short messages (sms) can nullify the gap in provision of quality health care to patients with co morbid conditions such as diabetes and hypertension in sub-Saharan region Kenya included[39, 53] where health care professionals cannot reach out to people with chronic disease who need their services. Despite that most of the studies have been done focusing on either a single disease or at a small feasibility study, this findings which are encouraging should be scaled up to rural areas and accommodate co morbid conditions.

3.3 Factors that affect Management of Comorbid Diabetes in Primary Health Care

There is adequate evidence that most countries in resource limited regions do not have health policies as road maps for the management of chronic co morbid conditions [1, 28, 54]. According to [55] surveillance through the collection synthesis and evaluation of data on diabetes risk factor plays a significant role in informing prevention programs and policy formulations and planning on chronic conditions [20]. Despite the proposal and the pressure from international bodies chronic disease surveillance has not been done to have adequate local data in countries like Kenya, Uganda, Tanzania and Rwanda [53]. Clinical guidelines are seldom used in lower level facilities as scenarios attributed to poor distribution and sensitization of health care providers on their availability, and lack of knowledge [14].

Majority of the population from literature gathered in developing countries in africa indicate that 90% of the patients buy medicine out of the pocket payments which is contrary to high income countries [54].There is evidence that higher levels of out-of-pocket payment are associated with exclusion from health facilities altogether, with ignoring of early disease and higher levels of 'catastrophic' health expenditure, implying that long-term household prosperity may be affected. Comorbid diabetes treatment being costly and poverty at its core in majority of the Eastern Africa countries, health cares records end up filled with defaulters who never turn up in health facilities unless the chronic conditions have worsened or led to multi-morbidity [27, 56]. The most current cost estimation of cost per disease indicate that it is possible for patients with comorbid conditions to have continued supply of multiple medicine[4, 52].There is need to design tailored chronic care models in East African health facilities whose focus has thus far been the control of infectious diseases and provision of housing. Therefore, comorbid diabetes and hypertension among other NCDs become an additional burden to an already fragile healthcare system and limited resources. Evidence across the region indicates that most health facilities especially in rural lack adequate structures and equipment and health resources for management of chronic co morbid conditions [27, 28, 54, 57].

Polypharmacy and multiple complex drugs use among patients on follow up care for co morbid diabetes and hypertension possess a significant challenge to both patient and health care systems. Co morbidity has been found associated with complex drug regimen [47] In a cross sectional study by[27] in Uganda, service provision for diabetes and hypertension revealed that unprofessional prescription of medicine in both government and private facilities, is common and exposes many patients to noncompliance and poor control of co-morbid condition. Further, in Uganda medicine prescription is often presumptive and medication usually obtained and taken without the use of diagnostic examinations and equipment both in government health unit and local drug shops [27].

Polypharmacy translates directly to increased cost, confusion of the patients and multiple side effects [58]. To avert the challenge, medication adherence clubs have been established especially in slum areas in urban settings for HIV, diabetes and hypertension with positive results [58]. The use of traditional medicine also adds to more options available for the management of comorbid conditions. There is enough evidence on the use of traditional medicine among patients with diabetes and hypertension [59, 60], yet its disclosure to health care providers remains very low and integration of the two systems of care remains elusive and lacks trust between providers.Low level of health literacy on chronic comorbid conditions such as diabetes and hypertension in the general population largely affect management of the same in primary health care [44]. Studies have shown that health literacy leads to poor interpretation of signs and symptoms or adverse drug effects of medicine, as patients levels of literacy in general population is low[8]. Inadequate knowledge on the conditions has also been found to be a challenge leading to poor health outcome[44], as it delays health seeking, adherence and hinders self-management skills including change of lifestyles behaviors[8]. Deficient empowerment of health care providers with adequate skills and knowledge also greatly hinder management of chronic comorbid conditions including diabetes and hypertension in primary health care [28]. Patients with low literacy and knowledge of chronic conditions may benefit from close interaction with health care providers who may reduce the gat and lessen the complexity of management with comorbid conditions.High levels of poverty as a socioeconomic factor are one of the many determinants of health. Management of chronic conditions and more so comorbid conditions could be expensive and hinders continuity of care for most patients and families. It is expensive to provide the needed interventions in the form of medicines, self-monitoring equipment and diet adjustments [34, 61] With the onset of chronic comorbid conditions individuals out of pocket for health expenses increases, thus increasing the vicious cycle of poverty. The inadequacy and inaccessibility of health insurance in rural and among the poor also continues to be a challenge to chronic care with its long term treatment and monitoring needs. According to a recent survey on the burden of chronic diseases on household in Tanzania and Kenya [62] concur that health insurance is not easily accessible to the local and still expensive for the general poor households. However they recommend the use of community based medical insurance to health alleviates health care, increase utilization and improve health outcome in chronic conditions in the region.

Poor screening habits and documentation of patients initial health records is seldom done in most public health facilities as comorbid diabetes and hypertension are considered as “disease of opulence[27, 28].Also, statistics show that awareness rate about high blood pressure is as low as 46.6% in Kenya reflecting

poor access to care [1, 56]. There is unequal distribution of resources in most of the health care systems in Eastern Africa, studies showing that the urban health system is developed while the rural setup often lacks adequate health resources. In Kenya just like its counterpart, there is acute shortage of health care workers [16]. In spite of the shortage the health care workers are disproportionally distributed, with majority working in urban settings as compared to rural settings where over 60% of the population resides. Worth to note, healthcare systems in these countries are poorly funded with none nearing the target set at the Abuja declaration 15 years ago.

According to [50] there is a gap between policy makers' recognition of a national chronic disease burden and the development and implementation of chronic disease policies and plans. Despite that most countries in developing countries responded to international response to NCDs, most have divisions of prevention and control of NCDs, and have developed strategic plans on the same diseases individually Implementations of the policies has been an uphill task for almost all the countries, due to lack of funding, deficient political will and lack of prioritization of NCDs least to say comorbid conditions [20, 28]. Concentration has been so superficial on the building blocks of health systems strengthening and limited policy structures which support chronic care prevention and control at the primary health care levels or even at tertiary levels[63]. According to WHO, country profiles for (Kenya, Uganda, Tanzania and Rwanda) in 2011,these countries have made mile stones in developing countries, but they are all directed at health systems perspectives and generalized with no specific action and strategies for comorbid conditions. According to[64], Tanzania response to NCDs in terms of policy is still missing overarching policies on interventions and community actions. They recommended the need for further utilization of evidence based intervention anchored on policies in the prevention of NCDs.

3.4 Belief Systems in the Management of Comorbid Diabetes and Hypertension

It is widely known that social cultural determinants of health have direct influence on health in terms of accessibility, utilization and adherence to treatment; they in turn have an influence on health outcomes [8, 64]. Several studies have highlighted the effect of culture in diagnosis; interpretation of the chronic conditions self-management behaviors and practices among patients. Several factors form the health belief systems which are much strongly associated with black Africans among other indigenous groups [50, 65, 66].

Family support and gender embedded roles, equally determine the health seeking behavior for patients with chronic conditions, where men and women need for support vary greatly as men are more dependent on others for support in health issues as compared to women [8]. The culturally embedded health seeking behavior and culturally determined gender roles have a direct influence on who to give permission for medical care and provision of finances. Women take a lesser role in decision making in term of when to see medical help for both the children and self, as compared to male patients [67-69]. Health care providers should always endeavor to understand the gender roles and behavior, and provide a culturally congruent care along the gender roles and expectations as culture plays vital role on how hypertension and or diabetes are interpreted or managed by individuals whether in relation to perceptions people may have about their health or in describing their health-seeking practices. In reducing the burden of NCDs in Africa, it is a comprehensive package for primary prevention, sound leadership, health-care interventions and improved surveillance[49]. For instance, reducing hypertension burden, top priority action entails reduction of salt consumption[70]. However, this action cannot be separated from cultural factors influencing nutrition-related beliefs and attitudes towards the use of salt in food preparation [71].Studies have established the use of traditional medicine among patients with diabetes and hypertension across the regions [66, 67, 72, 73]. Modern medicine mostly forms the second option of care after self-medication and traditional medicine has failed or are used concurrently [66, 67, 72]. In Uganda, the use of traditional medicine or herbal is attributed to control and relief of symptoms and modern medicine side effects[66]. Earlier notions traditional medicine accessibility and affordability stands as determining factors for the use of traditional herbal medicine among patients with diabetes and hypertension [64, 74, 75]. Despite the fact that patients have no clear knowledge of the concoctions used in traditional herbal medicines, the effects of use has been both positive and negative to individual and health care systems. The combination may alter their pharmacokinetics leading to an increase or decrease in plasma concentration thus altering the therapeutic outcomes. This is because medication have not been documented and scientifically evaluated to determine their efficacy and dosage despite being used for centuries[73]. Strong cultural, religious beliefs have been found to be the major determining factor on the use of traditional herbal medicine, despite the negative connotations attached to it as backward[67, 72]. The credibility of traditional medicine practitioners has greatly increased the usage of the traditional herbal medicine, the use of scientific evidence to convince their potential customers through the media, testimonies from the current users, continues to lure more new users into the use of herbal medicine, as has been confirmed with several studies in the region[66, 72]. However the interaction between modern medicine and traditional herbal medicine should be the first priority of health care providers to explain to the patients for an informed consent on the continued use [76].Religious activity or religiosity has been

defined as the degree of participation in and adherence to the teaching and the organized activity of a particular religion. Religious belief, on the other hand, is the fundamental belief system that could influence our ideas, values in life and ways of living. Many patients recognize the importance of religion in their own lives and would want physicians to take religious factors into account in their healthcare management. Spiritual and religious beliefs and activities can aid in coping with a chronic illness by providing support, confidence, and hope, or they can interfere with successful coping, as people may neglect self-care activities by relying on prayer and/or meditation to manage their illness[71]. Culture on the other hand, is the building block for constructing personal understandings.

IV. Conclusion

Diabetes mellitus and hypertension are important public health challenge in developing world and so is Eastern Africa. The two are complex with high burden of complications if not well managed. The epidemic is driven by multiple factors working collectively and they include lifestyle factors such as unhealthy eating reduced physical activity and smoking. Structural and system level issues such as lack of infrastructure for healthcare, urbanization, poverty and lack of government programs also drive this epidemic and hampers proper prevention, surveillance and treatment efforts. The level of progress in the knowledge and awareness of diabetes and its co morbid diseases has been slow. Health care systems should be strengthened for early detection and effective treatment of those affected with the non-cardiovascular disease. Various areas targeting both conditions and other major risk factors for cardiovascular diseases need to be improved so as to potentially help reverse the observed trends and they include, public and patient education ideally, by a profession to enable the community have an understanding of chronic diseases, continuous monitoring and screening as it will provide evidence to policy makers that will incorporate the needs of the poor in East Africa, more professionals, resources made available and finally cultural interpretation of disease should be put into consideration. Indeed there is need to design tailored chronic care models in East African health facilities whose focus has thus far been the control of infectious diseases.

Acknowledgement

We acknowledge the support received from the College of Health Sciences, Department of Nursing and Public Health of the University of Kwa-Zulu Natal –Durban South Africa.

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Marwa, Immaculate1,Comorbidity of Diabetes And Hypertension And Available Management Strategies In Eastern African." IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 6, no.6 , 2017, pp. 01-09.