Diabetes Mellitus in Nigeria
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Fundamentals of Public Health - MPH 500
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December 15, 2012
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Abstract

This qualitative research paper discusses Diabetes Mellitus in Nigeria from the viewpoints of epidemiology (risk factors and disease distribution in the population), biostatistical data, biological and molecular characteristics, social and behavioural factors, the psychological model of health behaviour in diabetes mellitus in Nigeria (the ecological model of health behaviour and the health belief model); as well as Public policies in place and policies that should be put in place to prevent diabetes mellitus.
Diabetes Mellitus Background

“Diabetes, an emerging epidemic, it can be linked to obesity, physical inactivity and diet; those most frequently affected are aged between 35 and 64” (Apeh, 2012). “Soon 4 out of every 5 people with diabetes will be living in developing countries, the working age group (bread winners) are most affected” (Mbanya, 2009). Diabetes is expected to account for 52% of deaths in Nigeria by 2015 because of Nigerians’ lifestyle, eating habits and nonchalant attitude towards comprehensive and routine medical check up (Duru, 2012).

Diabetes mellitus is a chronic disease which results from insufficient insulin (a pancreatic hormone that takes up glucose which is converted to energy into the cells from the blood) production by the pancreas or the body’s inability to use the insulin it produces effectively, resulting in (hyperglycaemia) increased glucose levels in the blood. It was rare in rural Africa, over the past few years it has become as an important non communicable disease in sub Saharan Africa (SSA) due to new lifestyles, imported dietary practices and globalization taking place in SSA (Azevedo & Alla, 2008; Mbanya, Motala, Sobngwi, Assah, & Enoru, 2010).

Diabetes mellitus is a chronic and severe disease which “epidemiologists predict that its economic impact and death toll will surpass the ravages of HIV/AIDS in the near future” (Azevedo & Alla, 2008). There is an increase in its incidence and prevalence despite an increase in awareness. Its high disease burden, mortality and morbidity are associated with its insidious onset, late diagnosis, ignorance, poor hygiene, infections, lack of foot care, inadequate blood sugar and blood pressure control (Chijioke, Adamu & Makusidi, 2010). The burden of premature death from diabetes is similar to that of HIV/AIDS, yet it is largely unrecognised (World Diabetes Foundation (WDF), 2012).
Types of Diabetes Mellitus

i. Type 1 Diabetes Mellitus

ii. Type 2 Diabetes Mellitus

iii. Gestational Diabetes Mellitus

Type 1 diabetes

Also called insulin-dependent diabetes mellitus (IDDM), immune-mediated, or juvenile-onset diabetes. It is the commonest metabolic and endocrine condition in childhood. It is caused by an auto-immune reaction. The body’s defence system attacks the insulin-producing cells. Type 1 diabetics produce little or no insulin. It usually affects children and young adults though, it can occur in any age group. It is difficult to distinguish it in adult age group as both type 1 and type 2 diabetes are treated with insulin (Soltesz, Patterson, Dahlquist, 2010). Type 1 diabetes prevalence is low. It ranges from 4 per 100,000 in Mozambique to 12 per 100,000 in Zambia (Hall, Thomsen, Henriksen, Lohse, 2011); 0·3 per 1000 in Nigeria (Afoke, Ejeh, Nwonu, Okafio, Udeh, & Ludvigsson, 1992); 0·95 per 1000 in Sudanese school children (Elamin, Omer, Zein, Tuwemo et al 1992; Mbanya, Motala, Sobngwi, Assah, Enoru, 2008). Incidence is low in Tanzania, 1·5 per 100 000 per annum (Elamin et al, 1992); high in Sudan, 10·1 per 100 000 per year (Swai, McLarty, Sherrif, Chuwa, Maro, Lukmanji, ..., Alberti, 1990).

Age at onset is a decade later in African communities than in the western communities. The age of onset in Africa is 22 – 29 years; it peaks at 15 - 19 years, in Tanzania 22 - 23 years, 21 – 30 years in South Africa, 20 – 25 years in Ethiopia (Afoke et al, 1992). In South African 23 years in blacks, 13 years in whites (Afoke et al, 1992; Kalk, Huddle, & Raal, 1993). It is commoner in females. (Mbanya et al, 2008; Afoke et al, 1992; Kalk et al, 1993). In Africa, it is common to breast feed for a longer time, it may be a reason for the reduced incidence and delay in onset of Type 1 diabetes.
Type 2 diabetes

Also called non-insulin dependent diabetes mellitus (NIDDM) or adult-onset diabetes. It is responsible for 90% of diabetes cases in SSA (Sobngwi, Mauvais-Jarvis & Vexiau, 2001). It is characterised by hyperglycaemia, insulin insensitivity secondary to insulin resistance, relative insulin deficiency and eventual pancreatic beta-cell failure (Maitra & Abbas, 2005; Kahn, 1994). Type 2 diabetes is as a result of interaction between genetic, environmental and behavioural risk factors (Chen, Magliano, Zimmet & 2011; Ripsin, Kang, & Urban, 2009) Presence of Insulin resistance results in impaired insulin mediated glucose uptake in the periphery (by muscle and fat), incomplete suppression of hepatic glucose output and impaired triglyceride uptake by fat. Diagnosis of type 2 diabetes usually occurs after the age of 40 but can occur earlier in populations with high diabetes prevalence. It can be asymptomatic for several years and will be diagnosed from associated complications or incidentally through an abnormal blood or urine glucose test. It is often, but not always associated with obesity which also causes insulin resistance. Information on epidemiology has increased though it is still limited; few data is available on the prevalence of type 2 diabetes in Africa (Mbanya, 2009). Incidence of type 2 diabetes is different from one geographical region to another due to environmental and lifestyle risk factors (Zimmet, Alberti, & Shaw, 2001).

Gestational diabetes (GDM)

The onset of high blood glucose levels is first seen during pregnancy. It develops in one in 25 pregnancies worldwide and is associated with intra and post partum complications. Usually, it disappears post partum. Women with GDM and their offspring are at an increased risk of developing type 2 diabetes later in life. Approximately 50% of patients with GDM
will develop type 2 diabetes five to ten years postpartum. Its prevalence is 1 - 14% of all pregnancies (Mbanya & Kaushik, 2006) and it varies from 0% in Tanzania to 9% in Ethiopia. Prevalence of intermediate hyperglycaemia (impaired fasting glucose, impaired glucose tolerance) suggests the early stages of a diabetes epidemic. Intermediate hyperglycemia includes; impaired glucose tolerance, impaired fasting glucose, total glucose intolerance. In individuals from Tanzania and Cameroon with low diabetes prevalence, rates of impaired glucose tolerance increased with a high epidemicity index of 88.4% and 83%, respectively (King, Aubert & Herman, 1998). In both of these populations, diabetes prevalence has increased over the past two decades (Ohwovoriole, Kuti & Kabiawu, 1988).
Epidemiology

Nigeria is Africa’s most populated country. Diabetes awareness in Nigeria is still low due to inadequate health education and prevention. Diabetes prevalence is low in some rural African populations; moderate (and even high) rates in other African countries. Some countries are in the early stage of the diabetes epidemic while others have progressed. The estimated prevalence of diabetes in Nigeria is 4%. Nigeria’s population is 160 million; more than 6 million people are living with diabetes in Nigeria (WDF, 2012). An estimated 10.8 million people had diabetes in SSA in 2006; this will rise to 18.7 million by 2025, an increase of 80% exceeding the predicted worldwide increase of 55% (International Diabetes Federation (IDF) Atlas, 2006).

The number of adults with diabetes in the world will increase by 54%, from 284.6 million in 2010 to 438.4 million in 2030 (IDF Atlas, 2009; Mbanya et al, 2010). People living with diabetes in SSA are projected to increase by 98%, from 12.1 million in 2010 to 23.9 million in 2030 (Diabetes Leadership Forum Africa 2010; Mbanya et al, 2010). Impaired glucose tolerance in SSA is expected to rise by 75.8%, from 26.9 million in 2010 to 47.3 million in 2030 (Mbanya et al, 2010; Nguma, 2010). This ratio is more than doubles the predicted global increase of 37%. There is a dearth of data on diabetes from Africa (Mbanya et al, 2010). Twelve million people were estimated to have diabetes in SSA in 2012. Diabetes is a severe health problem, competing for scarce resources with infectious diseases (Azevedo et al, 2008). Globally, an estimated 366 million people had diabetes in 2011; by 2030 this will increase to 552 million (IDF Diabetic Atlas, 2011). In every SSA country, there is an increase in the number of people affected with diabetes mellitus, 80% of people with diabetes live in low- and middle-income countries. Diabetes caused 4.6 million deaths in 2011 (IDF Diabetic Atlas, 2011). It is estimated that 439 million people would have type 2 diabetes by year 2030 (Chamnan, Simmons, Forouhi, Luben, Khaw & Wareham, 2011).
increase in prevalence in both rural and urban Africa affecting both genders equally. In Africa, diabetes is a “disease of opulence,” commoner among the rich in urban areas where people tend to be less physically active, feed on diet rich in saturated fats and refined sugars (Avezedo & Alla, 2008). Obesity is a significant risk factor to diabetes increased prevalence, leading to the use of the word “diabesity”, both in rural and urban areas (IDF Diabetic Atlas, 2007). World Health Organization (WHO) postulates that more than a third of the women are obese compared to a fourth of the men, with the poor affected equally as the rich (Avezedo & Alla, 2008). There will be a significant increase in adults with Type 2 diabetes in the next two decades, it is predicted that much of this increase will occur in the developing countries and a larger percentage of the patients will be aged 45 – 64 years, SSA will have the greatest increase in diabetes prevalence in any part of the world due to rapid urbanization and obesity (Wild, Roglic, & Green, 2004). This will result in a double burden for the developed world due to the trend of transition from communicable to non-communicable diseases (Yach, Hawkes & Gould, 2004). Proportions of patients with diabetic complications ranged from 7-63% for retinopathy, 27-66% for neuropathy, and 10-83% for micro-albuminuria (Hall V. et al, 2011). The most economically productive population, age 20 – 39, has the highest absolute and relative mortality rates (IDF Atlas, 2009). An estimated 61% of the 49 least developed countries as defined by the United Nations are in SSA, with some of the lowest incomes per head in the world (UN - Ohrills, 2010).

Five-year mortality rate of diabetic patients ranges from 4 - 57%. More than 40% of undiagnosed diabetes and poorly controlled previously diagnosed diabetes were incidental findings during diabetes screening (Hall et al, 2011). Constrains to accessing diagnosis and treatment include lack of diagnostic tools, glucose monitoring equipment and high cost of diabetes treatment. The estimated cost of diabetes management annually in SSA region was US $67.03 billion or US $8836 per diabetic patient (Hall et al, 2011). Prevalence of islet-cell
antibodies in affected individuals from SSA differs, a low proportion was reported in type 1 diabetics from Tanzania 8.6%, Nigeria 10%, South Africa 39.4% and Ethiopia 43% were positive for these antibodies. A high frequency 45.8% of persistent islet-cell antibodies was recorded after more than 3 years of follow-up in the South African study (Steyn & Fourie, 2005). Approximately 44% of patients with type 1 diabetes from South Africa and 29.8% of those from Tanzania were positive for glutamic acid decarboxylase antibodies, further supporting the autoimmune response. In the Tanzanian study, 21.3% of affected individuals were positive for antibodies against insulinoma-associated protein 2, and 42.6% had no autoantibody (Mbanya et al, 2010).
Risk factors of Diabetes

Risk factors linked to Type 1 Diabetes

Family history, presence of certain genetic factors, exposure to certain viral infections, increased maternal age at delivery, environmental factors, early introduction of cow milk, and obesity. Increased rate of childhood obesity between the 1960s and 2000s led to the increase in type 2 diabetes in children and adolescents (Barlow & the Expert committee, 2007).

Risk factors linked to Type 2 Diabetes

High fat diet and physical inactivity (Abdulfatai, Olusegun & Olokoba, 2012). Obesity which is expressed centrally by body mass index, by waist and hip circumference, or by waist to hip ratio. Lifestyle changes due to urbanization and economic development (generous alcohol consumption, cigarettes smoking, sedentary lifestyle and physical inactivity), these lowers energy expenditure (Hu, Manson, Stampfer, Colditz, Liu, Solomon, & Willet, 2001). Greater than a third of SSA population live in urban areas, a 45% increase is predicted by 2025.

Environmental toxins; a weak positive correlation was found between the concentrations in the urine of bisphenol A, a constituent of some plastics, and the incidence of type 2 diabetes (Lang, Galloway, Scarlett, Henley, Depledge & Wallace, 2008). Genetics and family history of diabetes; there is a strong inheritable genetic link in type 2 diabetes which increases in first degree relatives. Concordance among monozygotic twins is close to 100%, and about 25% of those with the disease have a family history of DM (Rother, 2007).

Aging; diabetes prevalence increases with age in SSA. As the diabetes epidemic matures, the age at onset will shift to younger age-groups and early-onset type 2 diabetes sets in (Jack, Boseman & Vinicor, 2004). Insulin resistance caused by medical conditions which can potentially give rise to, or exacerbate type 2 diabetes. This includes obesity,
hypertension, elevated cholesterol (combined hyperlipidemia), metabolic syndrome (also known as Syndrome X, Reaven's syndrome), acromegaly, Cushing's syndrome, thyrotoxicosis, pheochromocytoma, chronic pancreatitis, cancer, and drugs (Alberti, Zimmet & Shaw, 2005). Diabetes increases the risk of infections like tuberculosis, pneumonia and sepsis. Anti retroviral therapy for HIV/AIDS increases the risk of obesity and insulin resistance.
Biostatistics

More than 12 million people in SSA were estimated to have diabetes in 2010. Over the next 20 years, it is predicted that SSA will have the greatest increase in diabetes prevalence in the world. The prevalence of diabetes increased from 2.3% in the 1980s to 4.6% in 1996 in Tanzania, with a three to seven times rise in the 35—54 years age-group. In urban Cameroon, a fourfold increase from 1.5% in the 1990s to 6.6% in 2003 was seen (Mbanya et al, 2010).

The goal standard for diagnosis of diabetes is an episode of elevated blood glucose with symptoms of weight loss despite adequate caloric intake, polyuria, polyphagia, polydypsia, nocturia and polyuria. Fasting (no caloric intake for at least 8 hours) plasma glucose of 126 mg/dl (7.0 m mol/l); 2 hours plasma glucose or random plasma glucose of 200 mg/dl (11.1 m mol/l) or an abnormal oral glucose tolerance test (OGTT), (Standards of medical care in diabetes, 2012; World Health Organization (WHO), 2012). Across SSA, research centres are assessing approaches to identify people with diabetes, diabetic complications and examining diabetic risk factors. The method of diagnosis determines the prevalence rates. In a report from South Africa, diabetes prevalence was 36% lesser (2.5% versus 3.9%) when fasting plasma glucose was used than when an oral glucose tolerance test was used (Mbanya et al, 2010). With this, no patient with impaired glucose tolerance would be identified. Findings of this report and previous reports from SSA support the use of the oral glucose tolerance test for evaluating diabetes prevalence estimates in SSA (Mbanya et al, 2010). A current diagnostic criterion for diabetes is Glycated Haemoglobin (HbA1C) greater than 6.5% (International Expert Committee report on the role of the A1C assay in the diagnosis of diabetes, 2009). No data is available on use of glycosylated haemoglobin (HbA1c) as a diagnostic technique for diabetes in sub-Saharan Africa (Mbanya et al, 2010).
Diagnostic criteria for diabetes used in most studies in Africa is fasting blood glucose concentration, measured in either capillary whole blood or venous plasma. There is a need to further assess whether cost or the issue of standardised assay methods will restrict use of HbA1c in SSA (Mbanya et al, 2010).

The proportion of diabetic patients identified during diabetes screening determines the availability of healthcare facilities for diabetes detection and treatment. In SSA, less than 50% of study participants are known to be living with diabetes (Mbanya et al, 2010). In SSA, the highest rate of people living with diabetes detected during screening is reported in Tanzania and Guinea, 100% of newly diagnosed individuals living with diabetes are identified during surveys (Mbanya J. et al, 2010). There is a disparity in healthcare access in rural SSA compared with urban SSA (better healthcare facilities, availability of incidental screenings), it was noted that in urban South Africa more than 50% of people knew they had diabetes, only 15% were aware of their health status in rural South Africa. This is the case in other SSA countries (Mbanya J. et al, 2010).

In most African communities, diabetes care delivery is integrated into the national healthcare system. Specialised diabetes care centres are nonexistent and, where available, lack of resources makes it non-functional. Healthcare systems in most African countries are funded by state governments and priority is given to infectious diseases (Whiting, Hayes, & Unwin, 2003). Medical insurance and free National Health Service are not available. Patients pay for medical care out of pocket in most parts of Africa. African countries are poor, diabetes is expensive to manage and most individuals living with diabetes in Africa cannot afford the cost of management. It is a serious situation resulting in high disease morbidity and mortality from diabetes (Beran & Yudkin, 2006). Diabetes prevalence is predicted to double in the next twenty years in this region. In spite of the lack of resources in Africa, community-
based system with appropriate financing should be created to allow for cost-effective and rational use of the already scarce resources. There is a need for a call for action against diabetes in terms of advocacy, awareness promotion, increased health education and public health policies empowering people to diabetes self-management (Azevedo & Alla, 2008).
Biomedical basis of Diabetes Mellitus

Residence is a major determinant of diabetes in Sub-Saharan Africa, a ratio of 1.5 to 4 exists in prevalence between urban residents and rural residents. This is due to lifestyle changes in urban SSA associated with urbanization and westernization. Urban lifestyle in SSA is synonymous with a high consumption rate of refined sugars, saturated fat, lesser physical activity and a reduction in dietary fibre consumption (Mennen, Mbanya, & Cade, 2000). An increase in fasting plasma glucose in individuals who spent their lives in an urban environment has been noted suggesting that; lifetime exposure to, recent migration to, current residence in an urban environment are potential risk factors for obesity and diabetes mellitus (Sobngwi, Mbanya & Unwin, 2002). Cumulative effects over years of dietary changes decrease in physical activity, and psychological stress might contribute to developing diabetes mellitus.

Higher obesity rates was reported in South Africans living with diabetes (58—65%) compared with Tanzanians living with diabetes (9.1%) and Sudanese living with diabetes (7.7%). A similar pattern was seen in people with normal glucose tolerance (25.8—39.7% [South Africa only]) (Mbanya et al, 2010). Approximately 88,682 deaths were recorded in Nigeria related to diabetes in the last 12 months. South Africa is second to Nigeria in diabetes prevalence, with two million people living with diabetes in South Africa and a higher comparative prevalence than Nigeria at 7.4% and 63,000 deaths in the last year (IDF Atlas, 2012).
Cultural Issues, Social and Behavioural Factors related to Diabetes Mellitus

In Africa, health beliefs, knowledge, lay perceptions, and health behaviour interact strongly. Due to misconceptions as a result of popular health beliefs (Kiawi, Edwards, & Shu, 2006), Africans fail to take appropriate measures for diabetes prevention and risk factor control (Kiawi et al, 2006; Awah, Kengne & Fezeu, 2007). Obesity is perceived as a sign of good living, it confers respect and influence (Kiawi et al, 2007). This is a contextual environment, most people are poor, hungry and deprived therefore, and obesity is seen as an obvious social marker for affluence (Renzaho, 2004; Kiawi et al, 2007). As a result of persistent poverty and deprivation in sub-Saharan Africa, traditional perceptions and cognitive imagery about lifestyle risk factors of diabetes are unlikely to alter significantly, unless socio culturally appropriate health promotion campaigns are implemented (Mbanya et al, 2010).

Cultural perceptions of body size may be a challenge to reduce obesity rate. A larger body size has positive connotations in Africa; it is associated with affluence, health, attractiveness and happiness hence African women experience less pressure from male partners, family, society and friends to lose weight. A stigma is attached to the syndrome of weight loss and wasting associated with HIV/AIDS. Cultural perceptions of body size is changing, educated women are willing to reduce their body size for improved health and social reason. Diabetes educators, specialists, and multidisciplinary support teams are needed in diabetes management in SSA, especially in the rural communities. A simple care system based on protocol and education are introduced successfully and run by doctors and nurses in rural Africa with adequate glycaemia improvements and patients’ satisfaction (Price, Shandu, Dedicoat, Wilkinson & Gill, 2008; Kengne, Fezeu, Sobngwi, et al 2009; Sobngwi, Lekoubou, Dehayem, et al 2009). A major constraint to diabetes care in Africa is the lack of constant
access to anti-diabetic medications, especially insulin, at affordable cost. This results in underuse and preventable metabolic complications (Gill, Mbanya & Ramaiya, 2009). The emergence of diabetes in Africa, its heavy burden of morbidity and premature mortality results in additional socioeconomic costs, in terms of medical care and loss of human resources (Mbanya & Mbanya, 2003; Elrayah, Eltom & Bedri, 2005). It is threatening to wipe out our working class generation (Mbanya, 2009). The economic cost of diabetes management in Africa is huge, especially in the poorest countries. The estimated direct cost of diabetes care per affected individual is about 25% of gross national income per head for the 12 richest countries, and almost 125% of gross national income per head for the 34 poorest countries (Kirigia, Sambo & Sambo, 2009). The total cost (direct and indirect costs) of diabetes per person with the disease in these poor countries is more than double the gross national income per head (Kiriga J., 2009). Nigerians joined the rest of the World to mark this year’s World Diabetes Day on the 14th of November, 2012; stakeholders blamed the increasing burden of diabetes in the country on misconceptions, myths, taboos and unhealthy lifestyles (Diabetes Association of Nigeria, 2012). With over six million Nigerians living with Diabetes and 2.5 million Nigerians living with undiagnosed diabetes (IDF Atlas, 2012), Nigerians should take a step further to be responsible for their health by lifestyle adjustment, regular medical checkups and ensuring regular blood sugar checks, “strengthen the national health care system to encourage earlier diagnosis, prevention of complications” (Bahendeka, 2012). Dee Doo Nigeria an organization has taken up as part of its social responsibilities to increase awareness of diabetes mellitus among children in Benue State, this year’s theme is “Protect our Future.” Dee Doo Nigeria mentioned that; “Nigerians are at risk of having diabetes because of their life style, eating habits and nonchalant attitude towards comprehensive and routine medical check-ups; we hope that this awareness campaign would go a long way in sensitising our children who are our future to start developing habits which would ensure
healthy lifestyle now and for the rest of their lives.” (Apeh, 2012). There is a need to focus on educating Nigerians on how to prevent the causes of disease conditions like diabetes with a view to protecting the future (Ujah I., 2012). Nigerians should begin to pay more attention to their lifestyle and medication use; reduce consumption of refined sugar, carbohydrate, alcohol and tobacco use; curb over eating; increase physical activities and balanced diet should be consumed in healthy proportions. Bi annual medical screening is recommended (Usoro A., 2012). The misconception that only fat people develop diabetes was dismissed, “it is no more working because slim people are also coming down with diabetes.” (Ogbera A., 2012). Nigerians are urged to monitor their blood glucose levels and exercise, at least 30 minutes walking bi- weekly.
Health Belief Model

This model specifies several factors that determine whether an individual is likely to change behaviour when faced with a health threat like diabetes mellitus (Schneider M., 2011 p. 231). These factors include;

- The extent to which an individual feels vulnerable to diabetes mellitus (Schneider M., 2011 p. 231). Nigerians do not feel vulnerable to diabetes; the morbidly obese do not adopt any weight loss intervention.

- The perceived severity of diabetes mellitus (Schneider M., 2011 p. 231). Nigerians do not perceive diabetes as a severe disease; they seek care from churches, mosques, herbalists and only come to the hospitals when the complications have set in.

- Perceived barriers to taking action to reduce the risk of diabetes mellitus (Schneider M, 2011 p. 231). Poverty, ignorance, denial, misconceptions, lack of self worth, fear of healthcare workers and healthcare facilities are the perceived barriers to taking actions to reduce the risk of diabetes mellitus.

- Perceived effectiveness of taking an action to prevent or reduce the disease (Schneider M., 2011 p. 231). Impatience laziness and lack of determination are the perceived barriers to taking action to prevent or reduce diabetes mellitus.

- Self efficacy (Schneider M., 2011 p. 231).

Nigerians are less likely to adopt health lifestyles because believe they are subject to chance. There is a low self efficacy in the nation due to illiteracy, gender inequality. Women are more prone to obesity and no one is a mentor in the society corresponding to lack of motivation to engage in healthy lifestyle practices (Schneider M, 2011 p. 231).
Ecological Model of health behaviour in Diabetes Mellitus

Intrapersonal factors, includes knowledge, attitude and skills of Nigerians living with diabetes (Schneider M., 2011 p. 234). It plays a significant role in diabetes prevalence in Nigeria. Awareness and knowledge of diabetes is low. There is also a poor knowledge of composition and quantity of a healthy diet (Kiawi et al, 2006). Interpersonal factors, includes family, friends and co workers (Schneider M., 2011 p. 234). This level of the ecological model is not knowledgeable about diabetes, its risk factors or modes of prevention. This is due to the high level of illiteracy. Obesity is not seen as a health problem.

Institutional factors, includes institutional settings e.g schools and places of work. They have effects on health and health related behaviours (Schneider M., 2011 p. 234). In Nigeria, Health education and physical education classes are either nonexistent of form a small percentage of the school’s curriculum only. School and workplace cafeterias do not provide health conscious meals and food portions. Exercise facilities are not available in 90% of institutions and where it is available, they are hardly used. Enormous time spent in institutions reduces the tendency for physical inactivity (Kiawi et al, 2006).

Community factors, organisations, religious places of worship also act as a focal point for health interventions (Schneider M, 2011 p. 234). For several reasons the Nigerian community seems to help diabetes thrive. Obesity is seen as affluence in Nigeria (Renzaho, 2004; Kiawi et al, 2006). Due to gender inequality and religious reasons women should not wear certain outfits outside their homes. It is a taboo for women to be seen exercising in most cultures in Nigeria. A predominantly poor community, poverty results in unhealthy diet and reduces use of medical facilities (Kiawi et al, 2006; Unwin, Shu, Kamedjeu, et al 2006).

There is a growing physical inactivity due to recent urbanization, lack of time, negative perceptions and poor infrastructure. The culture and community seeks care from traditional healers and uses the hospitals as the last resort this resulting to the high disease burden of
diabetes in Nigeria (Kiawi et al, 2006). Nigerian diet is largely affected by seasonal availability of fruits.

Public policy, regulations limitations and measures put in place by government at all levels to promote health and prevent diabetes mellitus (Schneider M., 2011 p. 234). In Nigeria public policy on diabetes is regulated by each state. Local governments in conjunction with the state ministries’ of health organise free diabetic screening in the communities every quarter. This is insufficient compared to the enormity of the disease.
Policy Development

It is a challenge to achieve lifestyle changes in Africa due to the high level of illiteracy. Policy development will make a huge impact in the near-term, long-term success will depend on individual behaviour change. We must educate, advocate, counsel and mobilize individuals to change their lifestyles positively to prevent and minimize the impact of diabetes (International Diabetes Federation (IDF), 2012). Africa needs to move forward in area of health needs and policy formulation to accommodate people living with non communicable diseases like diabetes. A synergist effort should be applied; government of SSA Countries’ Ministries of Health should collaborate with Non Governmental Organizations interested in Diabetes to build capacity within the health system. National diabetes plan should be developed. Care should be standardized with use of treatment guidelines and support of research. Outreach programs should be part primary care facilities (IDF, 2012). There is a need to establish clear, ambitious and realistic global targets supported by action plans with monitoring and accountable framework working with several United Nations agencies to address diabetes a non communicable disease (WHO, 2012).

Nigerian Governments should liaise with its ministries of health, finance, transportation, urban design and agriculture to mention but a few to prioritize and invest in prevention, surveillance and strengthening of its health systems, structures, environment etc to deal with diabetes. International development institutions should prioritize diabetes prevention in its plan (IDF, 2012). All of Nigerian society; the private sector, non-profits and civil society should be involved in achieving this aim. To protect our future, the fight against diabetes must involve individuals and families who are the building blocks of the society.

Mass screening is not recommended but it is done frequently in Nigeria. Patients with risk factors should be screened (Gning, Thiam, Fall, et al 2007). In Nigeria, compliance to diabetes management is low, patients present in the hospitals when complications set in
(Otieno, Kariuki & Nganga, 2003). The theme of the World Diabetes Day in 2006 was “Diabetes Care for Everyone” which aims at promoting diabetes awareness, raising funds from non-government organizations and philanthropists to combat non-communicable diseases, sharing of the best evidence-based interventions, involvement of network groups and individuals in the campaign, and stimulating the mission and vision of diabetes prevention (Mongola, 2006). There is a lack of proper diabetic training for health care professionals in SSA resulting in high non-compliance rates and high morbidity rates of the disease. Lack of national guidelines, poverty and ignorance result in complications, like diabetic foot ulcers, which lead to gangrenes and death. Approximately 60% of the patients in SSA die while in treatment. (Avezedo & Alla, 2008; Mbanya et al, 2010). There is a need for properly motivated healthcare workers to provide continuing care and follow-up of diabetic patients (Barrett, 2004). Foot complications are the main cause of prolonged hospital stays; it is a major public health problem (Mwendwa, Otieno, Kayima et al 2005). In most of SSA, more than half of those suffering from diabetes die within a short interval of presentation in healthcare facilities, implying a life expectancy similar to that in Europe or North America before the insulin era (Diabetes Foundation Report, 2002-2004; International Insulin Foundation 2006).

Some SSA governments subsidize the cost of diabetic health care, in Nigeria, patients pay 72% of medications, transportation and laboratory tests about 7% of the total cost to the individual (Okoro, Adejumo & Oyejola, 2002). In the last 9 years in Nigeria, patients’ pays 100% of their health care cost for diabetes management; diabetes care is no longer subsided. In 2002, the World Diabetes Foundation (WDF) in conjunction with Novo Nordisk, attempted to increase insulin affordability in the least developed countries, lobbied pharmaceuticals to charge patients 20%, as it is practiced in the developed world (Azevedo & Alla, 2008). The following Sub Saharan African countries have benefited this WDF’S effort: Mauritania,

In collaboration with the WHO and the WDF, Novo Nordisk attempts to influence African governments to adopt four strategies; create national health strategies, build national health care capacity, promote the best possible pricing practice, provide and seek additional funding working through charity organizations, like the World Diabetes Foundation (Azevedo & Alla, 2008).

The International Diabetes Federation, Africa region, has many members, including more than 37 countries in Sub-Saharan Africa. “It aims at increasing and strengthening its membership in SSA and stimulating the formation of intra-regional joint diabetes research” (Avezedo M. et al, 2008). Several SSA governments are slowly heeding the call of the world and their own national organizations to accelerate their response to the diabetes pandemic threat. Part of priorities for SSA should be training of diabetes managers critical to the treatment and reduction of the threat. At the 19th World Diabetes Congress, the “Diabetes Declaration and Strategy for Africa” was launched by the International Diabetes Federation Africa Region. Through this declaration, IDF, WHO Africa Region, and the African Union agreed to combine efforts and called on governments, stakeholders, and partners to work towards prevention, improving the quality of life, and reducing morbidity and premature mortality from diabetes (Raimaiya, 2004; Unwin & Marlin, 2005).
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