

## **Health Education Intervention Strategies for the Prevention and Management of Diabetes in the Contemporary Society**

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**Abstract:** *This paper discussed the types of diabetes such as type 1 and 2, gestational diabetes, metabolic syndrome and pre-diabetes. It describes the causes of diabetes mellitus, signs and symptoms of diabetes, diagnostic measures of diabetes, management, and complications of diabetes. The paper further explains the health education intervention to prevent and manage the incidences of diabetes. The paper recommended that; more enlightenment campaign is to be provided for individuals, families and the communities by the relevant health agencies on recognition of signs and symptoms of diabetes; the government through the Ministry of Health and other health agencies to effectively promote the services of National Health Insurance Scheme on providing available and affordable services for terminal diseases and the need for the government and relevant voluntary organization to provide home-based services and the establishment of hospices that will cater for terminal illnesses.*

**Key Words:** *Type 1&2, Gestational, Metabolic, Pre-diabetes, Intervention*

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### **I. Introduction**

High blood glucose, more specifically, diabetes mellitus is a major health problem (WHO, 1998). Diabetes clinically is a non-communicable disorder but diabetics as a group are at increased risk of disease states such as heart diseases, blindness, nerve disorders, kidney diseases, gangrene etc (Nwafor & Owhoji, 2001). The exact causes of diabetic induced complications are not fully understood, the underlying factor that appears to make those with diabetes more prone to many health problems is prolonged and frequent elevation of blood sugar (Nwafor & Owhoji, 2001).

In spite of the great strides that have been made in the treatment of diabetes in recent years, many patients do not achieve optimal outcomes and still experience devastating complications that result in a decreased length and quality of life (Martha and Robert 2004). Providers often struggle to give the recommended level of diabetes care within the constraints of a busy office setting. Because our health care system is designed to deliver acute, symptom-driven care, it is poorly configured to effectively treat chronic diseases such as diabetes that requires the development of collaborative daily self-management plan through health education (Martha and Robert 2004). The word diabetes is from the Greek diabanein which means to pass through, in reference to the excessive urine produced as a symptom of these diseases. The term diabetes, without qualification, usually refers to diabetes mellitus, which roughly translate to excessive sweet urine (known as "glycosuria"). Several rare conditions are also named diabetes. The most common of these is diabetes insipidus in which large amounts of urine are produced (polyuria), which is not sweet (insipidus meaning "without taste" in latin) (Diabetes Australia 2013).

Nonye, (2002) was of view that diabetes is among the diseases of lifestyle, it is a disorder in which the body cannot convert food properly into the energy needed for daily activity. Osuafor (1997) said diabetes can be further be defined as a medical condition characterized by chronic increase in blood sugar level, secondary to impaired production of insulin or impaired action of insulin. Diabetes deficiency of insulin mellitus is a disease condition due to the inability of the body to make use of carbohydrates or sugar because of a deficiency of insulin. Insulin is a hormone produced by pancreas that is essential for the metabolism or use of carbohydrates. Insulin is responsible for facilitating the uptake or entry of sugar into the cells for energy production (Ernest, 1998).

The lack or deficiency of insulin leads to diabetes mellitus in which the blood sugar level is too high. The excess glucose is eliminated by the kidney and excreted in the urine. This is why the presence of too much sugar in the blood or urine is a sign of diabetes mellitus. Diabetes is a common disease but unfortunately many of the victims may not be aware of the condition. Diabetes can lead to serious complication but the good news is that diabetes mellitus can be modified or controlled. Patients with diabetes can live long and virtually normal life if controlled accordingly (Ernest, 1998). The presentation of this disease prompted the need for the review to create awareness for the general populace on identifying the basic signs and symptoms and its management on the sufferers.

## **II. Types of Diabetes**

1. **Type 1 Diabetes:** the body stops producing insulin or produces too little insulin to regulate blood glucose level:
  - Type 1 diabetes comprises about 10% of total cases of diabetes in the World.
  - Type 1 diabetes is typically recognized in childhood or adolescence. It is used to be known as juvenile onset diabetes or insulin dependent diabetes mellitus.
  - Type 1 diabetes can occur in an older individual due to destruction of pancreas by alcohol, disease, or removal by surgery. It also results from progressive failure of the pancreatic beta cells, which produce insulin.
  - It is an auto-immune condition in which the immune system destroys the cells in the pancreas which produce insulin. We do not know what causes this auto-immune reaction.
  - People with type 1 diabetes require daily insulin treatment to sustain life.
2. **Type 2 diabetes:** the pancreas secretes insulin but the body is partially or completely unable to use the insulin. This is sometimes referred to as insulin resistance. The body tries to overcome this resistance by secreting more and more insulin. People with insulin resistance develop type 2 diabetes when they do not continue to secrete enough insulin to cope with the higher demands.
  - At least 90% of patients with diabetes have type 2 diabetes.
  - Type 2 diabetes is typically recognized in adulthood, usually after age 45 years. It used to be called adult-onset diabetes mellitus, or non-insulin-dependent diabetes mellitus. These names are no longer used because type 2 diabetes does not occur in younger people, and some people with type 2 diabetes need to use insulin.
  - Type 2 diabetes is usually controlled with diet, weight loss, exercise, and oral medications. More than half of all people with type 2 diabetes require insulin to control their blood sugar levels at some point in the course of their illness.
3. **Gestational diabetes** is a form of diabetes that occurs during the second half of pregnancy.
  - Although gestational diabetes typically goes away after delivery of the baby. Women who have gestational diabetes are more likely than other women to develop type 2 diabetes later in life.
  - Women with gestational diabetes are more likely to have large babies.
4. **Metabolic syndrome** (also refer to as syndrome X) is a set of abnormalities in which insulin-resistant diabetes (type 2 diabetes) is almost always present along with hypertension, high fat levels in the blood (increase in serum lipids, predominant elevation of LDL cholesterol, decreased HDL cholesterol, and elevated triglycerides), central obesity, and abnormalities in blood clotting and inflammatory responses. A high rate of cardiovascular disease is associated with the metabolic syndrome (Diabetes Australia 2013).
5. **Pre-diabetes** is a common condition related to diabetes. In people with pre-diabetes, the blood sugar level is higher than normal but not high enough to be considered diabetic.
  - Pre-diabetes increases your risk of developing type 2 diabetes and of heart disease or stroke.
  - Pre-diabetes can typically be reversed without insulin or medication by losing a modest amount of weight and increasing your physical activity. This weight loss can prevent or at least delay the onset of type 2 diabetes.
  - An international expert committee of the American Diabetes Association redefined the criteria for pre-diabetes, lowering the blood sugar level cut-off point for pre-diabetes. Approximately 20% more adults are now believed to have this condition and may develop diabetes within 10 years if they do not exercise and maintain a healthy weight. About 17 million Americans (6.2% of adults in North America) are believed to have diabetes. About one third of diabetic adults do not know they have diabetes.
  - About 1 million new cases occur each year, and diabetes is the direct or indirect cause of at least 200,000 deaths each year.
  - The incidence of diabetes is increasing rapidly. This increase is due to many factors, but the most significant are the increasing incidence of obesity and the prevalence of sedentary lifestyles.

## **III. What Causes Diabetes Mellitus?**

Nonye, (2002) assert that the exact cause of diabetes is unknown but heredity may play an important role in the development of diabetes. Individuals whose parents have diabetes are likely to be diabetics. This fact does not necessarily mean that children of diabetic parent/parents will have the disease. Some other factors are unknown to predispose a person to developing the disease and they include excessive weight gain (obesity), lack of regular physical activity or exercise and side effects or certain drugs used for other health condition as well as stress.

The cause of diabetes depends on the type. Type 2 diabetes is due primarily to lifestyle factors and genetics. While type 1 diabetes also partly inherited and then triggered by certain infections, with some

evidence pointing at coxsackie B4 virus. There is a genetic element in individual susceptibility to some of these triggers which has been traced to particular HLA genotypes (i.e the genetic “self” identifiers relied upon by the immune system). However, even in those who have inherited the susceptibility, type 1 diabetes mellitus seems to require an environment trigger (Nonye, 2002).

Martha and Robert (2004) said the two main group of diabetes are insulin dependent diabetes also referred to as juvenile-onset diabetes and the non-insulin dependent diabetes also known as adult onset diabetes. In the case of insulin dependent diabetes, it is when a person develops diabetes below the age of 35. This is mainly because the insulin production is reduced. The patient needs a daily injection of insulin, but occasionally this type of diabetes may develop after the age of 35. Conversely, non-insulin dependents diabetes usually occurs after the age of 35 and the patient usually does not need insulin injection for treatment in this case there is sufficient insulin but it is not effective in facilitating the entry or uptake of glucose into the cells for energy production. Some drugs are taken orally to aid the utilization of glucose by the cells. In rare cases this type of diabetes occurs before the age of 35.

### **Signs and Symptoms of Diabetes**

The signs and symptoms of diabetes according to Nonye, (2002) and Ernest, (1998) include the following: Excessive thirst (polydipsia), frequent urination (polyuria), passing of large quantity of urine, frequent occurrence of boils, excessive eating (polyphagia), weight loss, numbness, burning or tingling sensation in the limbs, foot ulcer that fails to heal, sexual weakness, history of delivery of large babies, still birth or recurrent abortion in women, blurring of vision, dizziness and tiredness and altered mental status.

### **Diagnostic Measures**

A number of laboratory tests are available to confirm the diagnosis of diabetes. The test are: Finger stick blood glucose, fasting plasma glucose, oral glucose tolerance test, glycosylated hemoglobin or hemoglobin A1c and the urine test (Martha and Robert 2004).

### **Management of Diabetes**

The management of diabetes is highly individualized, depending on the type of diabetes, whether the patient has other active medical problems, whether the patient has complications of diabetes, and age and general health of the patient at time of diagnosis. This management plan encompasses; medical cares, insulin therapy, meal planning, engagement in physical activities and glucose monitoring (Diabetes Australia 2013).

### **Complications of Diabetes**

Both forms of diabetes ultimately lead to high blood sugar levels, a condition called hyperglycemia. Over a long period of time, hyperglycemia damages the retina of the eye, the kidneys, the nerves and the blood vessels.

- i. Damage to the retina from diabetes (diabetic retinopathy) is a leading cause of blindness.
- ii. Damage of the kidneys from diabetes (diabetic nephropathy) is a leading cause of kidney failure
- iii. Damage to the nerves from diabetes (diabetic neuropathy) is a leading cause of foot wound and ulcers, which frequently leads to foot and leg amputation.
- iv. Damage to the nerve in the autonomic nervous system can lead to paralysis of the stomach (gastroparesis), chronic diarrhea, and an inability to control heart rate and blood pressures during postural changes.
- v. Diabetes accelerates atherosclerosis, (the formation of fatty plaques inside the arteries), which can lead to blockage or clot (thrombus). Such changes can then lead to heart attack, stroke, and decreased circulation in the arms and legs (peripheral vascular disease).
- vi. Diabetes predisposes people to high blood pressure and high cholesterol and triglyceride levels. These conditions independently and together with hyperglycemia increase the risk of heart disease, kidney disease and other blood vessels complications (<http://rarediseases.info.nih.gov/gad/disease.aspz>).

## **IV. Health Education Intervention**

Health education is a social science that draws from the biological, environmental, psychological, physical and medical sciences to promote health and prevent disease, disability and premature death by educating individuals and communities to voluntarily change their behaviours to improve their health and well-being. Health education is the development of individual, group, institutional, community and systemic strategies to improve health knowledge, attitudes, skills and behaviour. The purpose of health education is to positively influence the health behaviour of individuals and communities as well as the living and working conditions that influence their health ([www.nchec.org](http://www.nchec.org)).

To effectively manage diabetes patients, the health educator must be able to set goals and make frequent daily decisions that are both effective and fit the values of the patients and their lifestyles, while taking into account multiple physiological and personal psychosocial factors. Intervention strategies that enable

patients to make decisions about goals, therapeutic options, and self-care behaviours and to assume responsibility for daily diabetes care are effective in helping patients care for themselves. Through health education patients discover and develop the inherent capacity to be responsible for one's own life (Martha and Robert 2004).

For effective implementation and management of diabetes, patients need education designed to promote informed decision making that will support patient efforts to become effective self-managers. Thus, in order to improve the self-care behaviour of diabetes patients, the health educator is to create awareness through health knowledge and promotion for the diabetes patients to be able to:

**Gather relevant information** through books, pamphlets, audio tapes or video tapes. Contact health providers that could cater for their ill health.

**Develop Self-care skills-** Get routing check-up; know how to take your medication, where to give insulin injection on the muscle etc.

**Observe yourself and your family** – Know your body and moods and that of your family. Notice basic signs and symptoms of illness and visit the hospital where necessary.

**Have the supplies you need** – ensure you have your diabetes kits to test your sugar level and have your medication constantly with you.

**Work closely with your Doctor** – Your health care provider knows a lot about the disease and how it should be managed. Ensure you work closely with them.

Inclusively, the health educators are to develop educational curriculum that will help the patients to individualize group educational programs and ensure that the content provided is relevant for the needs of the group. This program should incorporate interactive teaching strategies designed to involve patients in problem solving and address their cultural and psychosocial needs (Diabetes Australia 2013). The health educators are to provide referrals services for diabetes patients through educational programs and in the counseling session. The focus of health education should be on preventing the complications, which can cause serious disabilities such as blindness, kidney failure requiring dialysis, amputation, or even death. To prevent type 1 and 2 diabetes, however, it can be prevented in some cases. For instance;

- Control weight to normal or near normal levels by eating a healthy low-fat, high – fiber diet.
- Having regular exercise
- Keep alcohol consumption low
- Quite smoking
- If you have high blood fat levels (such as high cholesterol) or high blood pressure, take your medication as directed.
- Lifestyle modification and/ or certain medications can be used in people with prediabetes to prevent progression to diabetes.
- Drink an adequate amount of water and avoid taking too much of salt
- The skin should be taken care of; keep it supple and hydrated to avoid sores and cracks that can become severely infected
- Brush and floss the teeth every day. See the dentist regularly to prevent gum disease.
- The feet should be washed and examined daily, looking for small cuts, sores or blisters that may cause problems later.
- Insulin dependent diabetes should administer insulin injection as medically recommended.
- Regular Medicare and follow up of appointments are necessary in minimizing diabetes complications (Nonye, 2002).

## V. Conclusion

Diabetes mellitus is a chronic disease which is difficult to cure. Concentration is essential in the management of diabetes by keeping blood sugar levels as close to normal (“euglycemia”) as possible without presenting undue patient danger. This can usually be with close dietary management, exercise and use of appropriate medications (insulin only in the case of type 1 diabetes mellitus. Oral medications may be used in the case of type 2 diabetes, as well as insulin). Diabetes adds financial costs to the household budgets of individuals with diabetes and their families. There are many aspects to diabetes that add to the financial burden. Self-monitoring of blood glucose, insulin needles, syringes and pump consumables. The indirect, social and personal costs of diabetes are incalculable. Unless effective prevention strategies are put into place using health education, the incidence of diabetes will continue to rise. The growing national social and economic burden of diabetes underscores the importance of interventions to prevent diabetes and to delay or prevent its complications. This needs to be a vital and essential component of future health education intervention strategies for Nigeria.

## **VI. Recommendations**

- More enlightenment campaign is to be provided for individuals, families and the communities by the relevant health agencies on recognition of signs and symptoms of diabetes.
- The government through the Ministry of Health and other health agencies to effectively promote the services of National Health Insurance Scheme on providing available and affordable services for terminal diseases.
- There is the need for the government and relevant voluntary organization to provide home-based services and the establishment of hospices that will cater for terminal diseases.
- There is the need for further researches on the management of diabetes in order to curb its spread.

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