CHALLENGES FACED BY NIGERIAN FAMILIES DEALING WITH DEMENTIA: WHAT CAN BE DONE?

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The Chairman
The Matriarch of Gabi Williams Family
Members of the Board of Trustees
My Lords Spiritual, Temporal and Medical
Distinguished Guests
Members of the Press
Ladies and Gentlemen

I am honoured to be the Guest Lecturer of this year's Gabi Williams Alzheimer Foundation Lecture and I am grateful to the Planning Committee for considering me worthy. Let me start by commiserating with Dr. Gabi Williams' family on his demise on July 27, 2018 after a chequered career as Director, Disease Control and International Health and Chairman of the Special Programme on Research and Training of the World Health Organization. My recollection of him as Medical Officer of Health in Lagos City Council was his pronouncements on health matters which set the bar of practice and he was well respected. I had looked forward to meeting him in person as he was one of the medical gurus I admired while in medical school some four decades ago. I remembered his assertion at that time that "eating sugar did not cause haemorrhoids" as was traditionally believed. His words sent clear messages that changed opinions on health issues. I pray that his gentle soul continues to rest in perfect peace and that his memory will linger in our hearts. May God console his family. I wish to tender my unreserved apology for my inability to participate in the activities of the Foundation last year because of extenuating circumstances beyond my control. I am therefore delighted that I have been given a second chance to redeem myself and honour this medical icon. I wish to thank Dr. Olajide Williams who contacted me at the time of the commencement of the Foundation. We had met earlier in 2010 at the Nigeria-Florida Neurology Partnership (NFNP) meeting in Lagos. He presented his exciting work of raising awareness about stroke among the black population in New York, working with rap music artistes in the US. He developed a unique and innovative idea of using music to get across the message of the warning symptoms of stroke (FAST) to the black population. I am sure that the goals were achieved. NFNP had since fizzled out partly because of security concerns but we are delighted that Olajide has moved on to improving the plight of dementia sufferers.

The title of this lecture: **"Challenges faced by Nigerian families dealing with dementia: what can be done?"** was chosen by the planning committee and it is most appropriate at this time for bringing to the "front burner" the plight of families and caregivers managing cases at home, and proffer solutions to these challenges. The World Health Organization (WHO) has tagged dementia a "public health priority"[1]. I intend to briefly summarize what is known about dementia with local content and then utilize data available from our community-based studies to tease out the challenges and the unique approaches for overcoming them. Lastly, I will highlight some of the current international efforts at getting a united front for tackling the issues of dementia.

Definition

Dementia, also known as brain failure or loss of mind, is a clinical condition characterized by impairment in cognitive abilities (remembering things, orientation, language use, judgment, problem-solving abilities, abstraction etc.) that is enough to disturb activities of daily living in the conscious and alert state. It is the most common degenerative disease of the nervous system and a leading cause of death and disability.[1] Among neurological disorders, it ranked second after stroke as a leading cause of disability-adjusted life years. Dementia is an age-associated disorder, and with the rising proportion of the aged, referred to as the "greying revolution", the number of cases is expected to rise in the coming decades.

Burden and Types of Dementia

Dementia affects between 5 and 11% of the population above 65 years of age in the western world.[1,2] Earlier studies on the prevalence of dementia in sub-Saharan Africa (SSA) and India had reported much lower rates.[1,3,4] At a conference on dementia in 1985, a question was asked about places in the world where senile dementia appeared to be relatively absent? The response was "when the third world can afford the luxury of epidemiology, we will find an answer". Low and Middle-income countries now seem to have found the resources for carrying out good epidemiological studies and are providing more information on the burden of dementia. Table 1 (below) lists prevalence estimates of dementia from studies carried out in Africa.[3, 5-17] Some systematic reviews of data from Africa had also been carried out by Olayinka and Mbuyi, George-Carey et al.[18,19] According to a recent publication on the epidemiology of dementia in SSA, the regional estimate of age-specific dementia prevalence in people aged 60 years and over is put at 6.4%, and the rates double with every 7.2 year-increment in age.[20] This would imply that the old impression of lower continental rate may not be tenable.

Although it is always difficult to compare results from different studies that had variations in diagnostic criteria and the extent of case ascertainment, we have confidence on the quality of prevalence studies we had carried out in Ibadan in partnership with researchers from Indiana University, Indianapolis. Our community studies in the Ibadan environ (Idikan and Lalupon), had consistently reported rates around 3% for population aged 65 years and above.[3,15] If we assume that the population of Nigeria is 180 million people, and those aged 65 years and over constitute 5%, a rough estimate is that between 300 and 900,000 individuals have dementia based on reports from community-based studies. For the African continent, it was estimated that over 2 million people lived with dementia in the sub-Saharan African region in 2015 and that number is projected to reach 3.48 million by 2030, and 7.62 million in 2050; the greatest increase being expected in Eastern and Central SSA.[20] The increase in these estimates is largely driven by population ageing.

The total cost of care (direct medical, social and informal care), based on extrapolations from the calculations by Wimo et al,[21] at $2961 per person would range between $888 million and $2.6 billion. The total cost for sub-Saharan Africa was estimated to be US$ 6.2 billion in 2015. This is a huge financial demand and a major challenge that families caring for family members

with dementia need to meet. More so the cost of care increases as the illness becomes more severe. Therefore, the first challenge facing families will be finding the resources for care provision of relations who develop dementia. The government allocation to the health sector is miniscule and most care costs are borne by through family support.

Table 1. Prevalence Estimates of Dementia in Africa (community-based studies)

Authors (Ref)	**Study site**	**Sample size**	**Prevalence (%)**	**Comments**
Hendrie HC et al. (3)	Ibadan, Nig	2494	2.29	CSID; DSM III
Farraq AF et al. (5)	Assuit, Egypt	2000	4.5	MMSE; DSM III; 60 years
Ochayi B & Thacher M (6)	Jos, Nig	280	6.4	CSID 1 Stage
Gureje O et al (7)	Southwest Nig	2152	10.1	10-word recall +ADL; DSM Iv
Guerchet M et al. (8)	Djija, Benin Rep	514	2.6	CSID; 5-word test, DSM IV
Mbalesso HN et al. (9)	Bangui, CAR	496	8.1	CSID 5-word test; DSM IV
Guerchet M et al (10)	Congo	520	6.7	CSID, 5-word test, DSM IV
Yussuf AJ et al (11)	Zaria, Nig	322	2.79	CSID DSM IV
Paraisso MN et al. (12)	Cotonou	N/A	3.7	CSID, 5WT, 65 years Urban
El Thallawy HN et al (13)	Al Qusser, Egypt	8173	2.01	50 yrs; MMSE, DSM IVTR
Longdon AR et al (14)	Tanzania	1198	6.4	70 years+; CSID DSM IV
Ogunniyi A et al (15)	Lalupon, Nig	613	2.9	65 years, SCID, DSM IV
Khedr E et al. (16)	Qena, Egypt	691	5.07	60 years, CSID
De Jager CA et al (17)	Cape Town, SA	1394	11	CSID, One-stage study

Alzheimer's disease is the most common type of dementia and accounts for between 50 and 75% of the cases. Next in order of frequency is vascular dementia that follows stroke (cerebrovascular diseases). The other types that have been reported from Nigeria are: Lewy Body dementia, fronto-temporal dementia (old name: Pick's disease), Parkinson's disease dementia, Huntington's disease dementia and Dementia with Depression. These cases are chronic (long term) and are largely untreatable. However, there are treatable or reversible cases of dementia usually resulting from several medical situations such as: blood collection inside the skull in elderly (chronic subdural haematoma), brain tumors, excessive alcohol intake, use of certain medications in the elderly, metabolic disturbances, normal pressure hydrocephalus and chronic infections. Of the latter, one must always remember the human immunodeficiency virus infection and the acquired immune deficiency syndrome (HIV/AIDS) with HIV-associated dementia. This is not very common in the older persons but should be considered wherever HIV infection is very common.

Risk factors for Dementia:

The rarity of dementia in SSA about three decades ago was ascribed to non-exposure to environmental toxins that were only supposed to be present in western countries as speculated by Hendersson,[22] The story seemed to have changed with the rising number of cases being managed currently. It was the search for such environmental protectors or initiators of the dementia pathology that led to the surge in studies of dementia in low and middle-income countries. The important factors associated with increased predisposition to dementia include: advancing age, low education, vascular factors especially hypertension, traumatic brain injury, dietary deficiencies of vitamins, depression and occupational exposure to toxins and heavy metals. Dementia risk appears to be higher in female individuals in our environment and this has been ascribed to their longer life span since dementia is an age-associated condition. Also, social isolation appeared to increase the risk of dementia. A recent study in Zaria reported that low education and absence of a spouse increased the risk of dementia in diabetic patients.[23] Other vascular risk factors like obesity and physical inactivity have been reported in some studies to increase dementia risk particularly in mid-life. Unexplained weight loss in older persons should raise suspicion about the onset of dementia. We reported greater decline in such individuals compared with normal older persons matched for age and gender in our Idikan cohort.[24]

Genetic predisposition is of interest particularly because family members would want to know if they are likely to develop the illness. Only 5-10% of cases have a genetic basis; hence the likelihood of familial occurrence would be 1 in 10 for close family relatives. There was no report of clustering of cases in families in our limited experience. The fear of developing dementia by family members can be regarded as a challenge. Our work has focused on association between apolipoprotein E (E4 allele) and dementia. APOE is associated with cholesterol transport and is linked with sporadic dementia cases in western countries. Initially, we reported no association with dementia and Alzheimer disease among the Yoruba cohort we studied, as other authors in

Africa had reported, but recent analysis of the Ibadan data showed an association.[25] The link needs to be examined in subsequent studies.

Clinical aspects:

Dementia is difficult to recognize in the early stages when it may be confused with age-associated changes in brain function. However, when inopportune mistakes occur and the symptoms progress, the diagnosis will not be in doubt. The warning signs of dementia include: memory loss that affects job skills, difficulty performing familiar tasks, problems with language or use of words, getting lost (disorientation to time and place), inability to take decisions or poor judgment, problems with reasoning (abstract thinking), misplacing things, mood changes or behavioural and personality change as well as loss of initiative. Perhaps, manifesting one or two of these features infrequently can be condoned but if they are multiple and become the norm rather than the exception, family members need to raise alarm and seek attention.

The typical functional changes are: problems with managing finances, buying things, cooking without getting food burnt all the time (for women), independently managing medications, personal hygiene (dressing, feeding, toileting), giving advice, performing the usual roles in the family/office/society; social engagements and home organization. Older persons can occasionally forget where they place their keys, but it becomes a problem when they don't know how to use the keys.

The various types of dementia have distinguishing features particularly in the early stages as shown in Table 2; but as the disease advances, the manifestations may become mixed and indistinguishable. In the advanced stage, the illness is considered dehumanizing as the individual is completely helpless, mute and uncomprehending. The situation bewilders family members, and this constitutes the third major challenge as it becomes a nightmare situation that never ends. Imagine the grandparent using diapers, being spoon-fed and totally behaving like a child. The picture was best captured in Shakespeare's As you like it Act II, Scene VII: *"Last scene of all, that ends this strange eventful history, is second childishness and mere oblivion: Sans teeth, sans eyes, sans taste, sans everything"*. Neglect may occur at this stage from helplessness with the situation and exhaustion of the caregivers. The affected individual may then develop chest and urinary tract infections, clots in the blood vessels (deep vein thrombosis) and skin ulcers which contribute to their demise. Dementia patients have higher death rates due to these complications.[26]

Table 2: Distinguishing features of Common Degenerative Dementia Sub-types:

Sub-type*	Predominant Clinical features	Pattern of Progression	Pathology
AD	Memory loss predominantly	Progressive	Amyloid deposition, elevated CSF tau protein; brain atrophy
VD	Focal deficit, executive problems	Step-ladder	Infarcts, lacunes, microbleeds; subcortical and cortical
FTD	Behavioural problems, language deficit	Progressive	Circumscribed atrophy of the brain, astrogliosis; inclusions (Pick's bodies); Progranulin
LBD	Visual hallucinations, non-motor Parkinsonian features	Fluctuation	Lewy bodies, alpha-synuclein deposition; brain atrophy
PDD	Slowness, Rigidity, memory loss + executive problems	Progressive	Depigmentation of substantia nigra, Lewy bodies
HDD	Chorea + cognitive dysfunction	Progressive	Atrophy of caudate nucleus, astrocytosis; trinucleotide repeats

*AD = Alzheimer's disease; VD = Vascular dementia; FTD = Fronto-temporal dementia; LBD = Lewy Body dementia; PDD = Parkinson's Disease dementia, HDD = Huntington's Disease dementia

Behavioural and Psychological Symptoms of Dementia (BPSD)

These are heterogenous, non-cognitive symptoms encountered in about 90% of dementia patients either in the early or intermediate stage of the disease.[27] They constitute a major challenge to family members caring for individuals with dementia. BPSDs include: agitation, aberrant motor behavior, anxiety, elation, irritability, depression, apathy, disinhibition, delusions, hallucinations, and sleep or appetite changes. BPSD add to caregivers' distress and are associated with poor outcomes, long-term hospitalization, medication misuse and increase in health care costs.[27] They thus constitute a challenge.

Some of the behavioural problems encountered in our Idikan cohort included: irrational behaviour, locking self in the toilet and not knowing how to open door, wearing different clothes or multiple clothes, mismatch of wrapper and dress with refusal to take corrections; asking to be taken back to Ibadan where the individual was at that time; wanting to go out to visit a person that could not be named and inability to pray. One woman was so suspicious that she refused family members to cook her meals and she subsequently kept the remaining food in her room even as it got bad. Another person manifested aggression by pouring hot water on a family member for no reason whatsoever and without remorse.[28]

One peculiar BPSD that has not been documented in Nigerian patients but common elsewhere is Capgras syndrome which is characterized by a recurrent or transient delusional belief that a person, usually someone closely-related such as the spouse, has been replaced by an impositor.[29] The syndrome is based on misidentification and wrong accusations. Some vivid examples provided by Joseph in his excellent contribution on the subject are listed here to show how varied the complaints can be: A patient believed his daughter had been replaced by his dead sister, another believed that her husband was a lady and/or a stranger living in the same house; A patient looked at his wife and still asked, "where is my wife"? Another example is a belief "that so many people including his wife bore the same name; A female patient said she was looking for her husband named Bob even though he was present. The accusations are so bizarre and can be quite distressing to caregivers and other family members. The purpose is to alert family members that should they encounter such, they must blame it on the illness and seek medical help for the individual with dementia.

From our experience, it appears that Nigerian families are quite tolerant of deviant behaviors of persons with dementia even though they seem to be encountered less frequently. In a comparative, cross-cultural study, Hendrie and others reported personality changes in 37% of Nigerian patients compared with 64% for African Americans; and that overall, the frequencies of behavioural disturbances appeared to be higher among African Americans and Jamaicans when compared with Nigerian patients.[30,31] The latter however, had a higher frequency of embarrassing situations. Using the Neuropsychiatric Inventory (NPI), Baiyewu and co-workers documented that caregivers were often stressed by night-time behaviour, disinhibition, anxiety, agitation/ aggression and irritability (these constituted the embarrassing situations). There was high tolerance for hallucinations, elation/euphoria and appetite change.[32] It was noted that the greater tolerance for deviant behaviour and hallucinations among Nigerian family caregivers was to avoid family stigmatization within the community. Family members looking after their older persons with dementia can seek the help of psychiatrists in handling the behavioural and psychological problems as they arise. BPSD can lead to stigmatization within the community and can result in concealment of cases.

Awareness, Stigma and Dementia

Stigma is associated with stereotyping of individuals and is defined as a socially-discrediting attribute, behaviour or reputation. It is a major challenge that family members face. It is universal and has been ascribed to ignorance and poor understanding of the disease resulting in misconceptions. Stigmatization is a huge problem in SSA according to the recent review on the disease. In our experience in Lalupon community, Lagelu Local Government Area of Oyo State, dementia was referred to in various derogatory ways during a focus-group discussion conducted by Adebiyi and others: "memory loss disease", "ageing disease", "disease of insanity" and "dull brain". Enacted stigma was evident as 36% of the respondents felt that dementia was associated with shame and embarrassment within the community. A third opined that demented individuals would prefer to conceal their diagnosis and 28% felt that

demented individuals should not be taken seriously. Demented individuals were usually scorned and became relegated citizens.[34]

In a survey of Priests in Nnewi, all of them believed that dementia was caused by evil spirits and none believed that dementia could be cured. Ninety percent of them did not support orthodox care for patients with dementia.[35] Such misconception within the community by professionals that should counsel others has resulted in the individuals with dementia being taken to at least 2 other service providers (churches, native healing centers, homeopathy, private hospitals, patent medicine stores etc.) before proper assessment by experts on the disease. It can be described as jumping from the frying pan of native healers who demanded sacrificial materials (goat, rams, cloth bales, palm oil) to the "holy ghost fire" of churches practicing exorcism of the supposed evils spirits. The result is that families are in a quandary as to where best to seek health for the patient. Such pacing or "toing and froing" resulted in time wasting and disease progression to advanced stages by the time of consultation. According to a report by Uwakwe in Nnewi,[36] up to 3 years was lost on the average (1-6 years) before consultation of mental health experts. It was reported that the equivalent of $44 was spent on transportation alone per patient and other expenses included sacrifices and material gifts. Uwakwe believed the social stigma of all mental disorders and the consequent negative attitude to mental health care professionals by the public had greatly limited mental health care services for the care of demented patients. Some of the documented ill-treatment of the person with dementia in Eastern Nigeria included the affected individual being locked up at home to avoid family embarrassment and/or getting lost; starvation, beating, stoning and being forced to make fictitious confessions of theft etc. to their own ridicule.[37] Older people with mental illness are often branded witches and may meet accidental deaths or be forcefully restrained, a form of elder abuse that should be decried. The money wasted in seeking alternative care can be diverted into taking care of the patient at home and paying for domestic helps.

The key recommendations for overcoming the stigma of dementia hinge on communication, educating the public and primary health care physicians, reduction of isolation, engaging individuals with dementia on issues that involve them so that they can have a voice and, lastly, by providing local support. The advice by a caregiver in Venezuela on raising awareness and educating people about dementia from an early age through incorporation of respect and support for this type of disease into cultural practices is very apt.[33]

Dementia and inopportune mistakes

Functional impairment combined with cognitive impairment, particularly forgetfulness can result in mistakes that can have terrible consequences and pose challenges to family members. Examples include the patient with dementia forgetting to close the tap or bathroom faucets resulting in house flooding or failure to turn off the gas after cooking and lighting a match later resulting in fire. These mistakes were best espoused in the Notebook written by Nicholas Sparks:

"An iron in the freezer,
clothes in the dishwasher,
books in the oven…."

The solution is never to leave such individuals unsupervised and the caregiver should not be tired of checking all appliances in the house that the patient had used earlier to ensure that nothing that could constitute danger is left unattended, almost to the point of obsession.

Caring for People with Dementia

This is by far the biggest challenge faced in Africa since home care is the norm. Individuals with dementia are usually looked after by family members and paid domestic servants, quite unlike what obtains in developed countries where such patients are institutionalized.[28,38] This requires that many hands be available for care because the demands can be enormous. The multigenerational living arrangements had eased the stress of home care because many family members lived under the same roof or within the same compound attending to the needs of the elderly, whether infirmed or not. In recent times, some well-to-do families also hired professional nurses to provide home care services, but the cost is usually prohibitive. The caregivers usually bear the brunt of the disease and such individuals are stressed and suffer from depression.[39] In the advanced stage of dementia, when constant supervision is required, hospitalization may be necessary for the management of acute, life threatening complications. There is always that feeling that it is better for the elderly to die at home rather than in hospital. The stigma of destitution attached to institutional care makes such homes not the ideal management option, especially among the Yoruba.[38] The Federal Ministry of Social Welfare Policy on Aging (1989) also de-emphasized nursing home care but encouraged home care. However, the extended family system, which served as buffer in the past has been eroded by schooling, economic pursuits and rural-urban migration. In addition, emigration of the working class to western countries has depleted this family support service. The consequence is inadequate care for individuals with dementia at home.

A ready solution is to establish "creche" service for older persons with dementia like what exists for children. This would ensure that some supervised care is available in daytime while family members in gainful employment go about their chores. They can then collect the individual with dementia when they close at work. Another approach is to have Geriatric Centres for looking after the interest of elderly individuals with dementia. The University College Hospital, Ibadan has blazed the trail in this regard with the opening of the Tony Anenih Geriatric Centre that provides specialized care for older persons (above 65 years of age). Both preventive and curative services are provided by experts in Geriatrics, and it is well patronized. The Bright Omokaro Foundation in Abuja provides similar service and there may be many more. I think this is the way to go in caring for our older folks with dementia.

Empowering the care providers (usually the spouse and daughters) is also essential, more so as they bear the brunt of the stresses and deal with the behavioural challenges. Our experience revealed that monthly meetings with these caregivers during which they exchanged ideas on coping mechanisms, caring methods and discussions on the problems faced, enabled them to cope better.[28,38] The dictum: *"a problem shared is a problem half-solved"* is appropriate provided the other person has something positive to contribute. In addition, caregivers were provided with free medications for any ailments they suffered. This approach is also recommended.

The treatment of demented patient is purely symptomatic and supportive. Medications for memory enhancement and behavioural challenges are often prescribed by physicians. The most commonly drug prescribed is Aricept (Donepezil), an anticholinesterase agent. Other drugs like Gallantamine, Rivastigmine, and the anti-glutamate drug (Memantine) are not available. A recent audit of medications available for the management of dementia at the University College Hospital Pharmacy Department revealed that 5 mg Donepezil costs N4.20 per tablet while the 10 mg retails at N4.00. However, the drug was out of stock and was not listed in the NHIS formulary* at the time of the audit. The drug was however available in nearby pharmaceutical shops. Risperidone (Amidrex) is usually prescribed for behavioural symptoms, and it retails at N5.50 per tablet. The cost of the drugs and availability concerns affect adherence to therapy and hospital visits, particularly for families who live below the poverty line of less than $2 per day. Relations are thus forced to seek alternative care.[36] Other memory-enhancing drugs like Gingko Biloba, Vinpocetine (Cognitol) are available and have been tried with minimal or unsustained clinical improvement. Since dementia burden is increasing in SSA, it is important that the essential drugs for care are included in the NHIS formulary and the stress on family members reduced by making the drugs available in hospitals.

One form of treatment that seems feasible based on the findings from the Identification and Intervention for Dementia in Elderly Africans (IDEA) study is Cognitive Stimulation Therapy, a form of group, reminiscent therapy. It was originally designed by Spector and Orrell[40] and later modified for use in SSA by the IDEA team of researchers.[41,42] It was shown to cause a modest improvement in cognition especially language function and to reduce caregiver burden. Our colleagues in Tanzania showed that it was as effective as Donepezil in their group of patients. Another approach is the use of humor to brighten the life of dementia patients. In a recent publication of the American Association of Retired Persons (AARP), it was reported that humor could bring out unexpected attributes in demented individuals. Such cheap, non-pharmacologic means should be explored in managing patients and reducing these management challenges. CST can be included in routine care as group therapy at "creche" outfits. Life will be made better and less stressful for families with demented individuals with cost saving through these novel approaches.

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*The National Health Insurance Scheme was established under the National Health Insurance Scheme Act, Cap N42, Laws of the Federation of Nigeria, 2004, and aimed at providing easy access to healthcare for all Nigerians at an affordable cost.

Dementia Prevention

The focus for low and middle-income countries should be on dementia prevention to avoid the looming epidemic in the setting of miniscule budgetary allocation to health. This should be achievable through concerted efforts at managing the risk factors and promoting the protective factors. The suggested approaches include: social engagement to avoid isolation; educating the public on risky health behaviours, prevention of strokes by targeting blood pressure control using anti-hypertensive medications and promotion of low-salt diet, use of statins to lower blood lipids and engaging older folks in mental stimulating activities. Prevention of head injuries mainly from vehicular accidents by enforcing road traffic laws, prevention of falls which are common in the elderly due to physiological and medical reasons as well as trivial domestic injuries on slippery surfaces which can result in sub-dural collections with acute confusional state or frank dementia are points worth noting for optimal brain health. *"Use it or lose it"* is an important catch phrase for the elderly because the more the brain is used, the better the synaptic connections and the less the chance of cognitive decline according to Gary Small in his book "Memory Bible".

Physical activity deserves special attention and comes highly recommended. it should be embraced by everyone seeking to prevent age-associated cognitive decline and Alzheimer's diseases. Many adults are physical inactive according to a recent publication from the WHO, which reported that only 1 in 4 adults are engaged in physical activity because of increasing use of technology and global travels. Everybody needs to be informed about this and there should be a change in attitude. The 2018 Alzheimer award was won by Greg Kennedy and colleagues of Swinburne University of Technology, Hawthorn, Australia for their work on how exercise improved cognitive ability. The possible mechanisms include the effects of exercise on brain-derived neurotropic factor (BNDF), insulin sensitivity, stress and inflammation.[44]

Smoking cessation and alcohol restriction, started as early as possible before the consequences are seen in old age, are important for the prevention of chronic cardiovascular disease and the Federal Government needs to be commended for increasing tariff on alcoholic beverages as well as widespread notification of the harmful effect of smoking in the news and electronic media. Designation of "smoke-free spaces" should be implemented by law. Consumption of fruits and vegetables will also enhance cardiac and brain health.

Promoting dementia awareness amongst the public by international efforts:

The challenges of dementia and Alzheimer's disease are universal and demand a collective approach. An international consortium has drawn up a plan of action for combating the

challenges of dementia on a global scale.[45] The key elements of the action plan include: 1) Development of national plans including assessment of relevant life-course risk and protective factors; 2) Increased investments in national research programs on dementia with approximately 1% of the national annual cost of the disease invested; 3) Allocating funds to support a broad range of biomedical, clinical, and health service and systems research; 4) Institution of risk reduction strategies; 5) Building the required trained workforce (health care workers, teachers, and others) to deal with the dementia crisis; 6) Ensuring that it is possible to live well with dementia; and 7) Ensuring that all have access to prevention programs, care, and supportive living environments. The WHO plan of action against dementia are similar. These action points have been highlighted in various sections of this presentation. They should therefore be achievable with the right will for "where there is the will, there will always be the way".

In conclusion, the challenges of dementia are numerous, and they include problems of diagnosis, personality and behavioural changes, mistakes that may have life-threatening consequences, economic problems related to cost of care (both direct and indirect), non-availability of drugs in hospitals and the social problem of diminishing family sizes which has a bearing on the number available to provide care. My proffered solutions include improved awareness through public enlightenment campaigns, early diagnosis and prevention of dementia, close monitoring of older persons with dementia so that they neither constitute dangers to themselves nor to others as well as support for the caregivers. It is important that the medications for memory and behavioural challenges be included in the NHIS formulary, but more importantly, the drugs should be readily available. Overall, brain health is paramount, and every effort should be made to ensure that challenging health situations are reported early, and proper management instituted.

Dr. Gabi Williams was indeed an outstanding public health physician who dedicated his life to the service of humankind. Although he is no longer with us, his contributions will continue to inspire us. I am eternally grateful for this invite to present this lecture in honour of a great man, a guru in public health and a great family man. I pray that his legacy in health matters will remain evergreen and that the plight of individuals with dementia will be better with GWAF's actions.

Acknowledgement:

It is appropriate to put on records and acknowledge the role played by Chief Kiki Laniyonu-Edwards in promoting dementia awareness. She single-handedly brought the Alzheimer Disease International conference to Nigeria in 2016. She also established a WhatsApp platform tagged "Alzheimer and Related Disorders" on April 5, 2018 for communication between researchers and those engaged in dementia care. It has turned out to be a vibrant platform with sharing of educational materials, conference announcements, current practices and other useful details for families. She has initiated "Friend of Dementia" movement for discussing management problems and getting national/ international attention on social aspects and management

concerns. While preparing this lecture, she provided me with materials from the WHO conference on "Policy guidance on developing national dementia plans" held in Brazzaville, Republic of Congo and slides from the "Journey of awareness 2013-2018".

"*Knowledge is power"* and the Gabi Williams Alzheimer's Foundation (GWAF) should also be commended for being ahead of the curve through the development and circulation of educational materials on dementia to provide necessary information to families and caregivers about the symptoms and management options for dementia. That is certainly the way forward to increase awareness, understanding and tolerance by the public. I salute their vison.

I wish to thank Prof. Olapeju O. Esimai of the Department of Community Medicine, Obafemi Awolowo University, Ile-Ife for editorial review and useful suggestions. I also acknowledge Drs. Ayotunde Bisi and Tomiwa Maknajuola for reading through the article and for their comments.

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