Enabling and empowering—the need for an integrated approach to address hypertension among African adults

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Abstract

This paper charts analytic and conceptual debates on the burden of hypertension among Africans and the interlocking role of diet and genetic factors. The discussions in this paper are about (indigenous) rather than (white) Africans. In trying to show understanding in the issues raised within this paper, the debate highlights the increasing burden of hypertension in Africans. The paper also mentions the role of adverse factors over the life course on hypertension, which is described in public health literature as a widespread burden. It also mentions that there appears to be an increasing prevalence of high blood pressure among Africans explained by widespread nutrition transitions to lipid-rich diets and a decrease in physical activity; as a result, hypertension has become a ubiquitous cause of morbidity and contributor to mortality among Africans. While these issues are acknowledged, the authors argue that it is not enough to think that persuading and encouraging poorer households to purchase ‘cheap’ and less fatty foods will address nutritional problems. It is one thing making food available and it is another putting the food basket on the table. Both conditions require negotiations of complex political, social, economic, cultural and environmental hurdles. What is needed is reorienting existing health care systems to meet these challenges while empowering and saturating African populations and households with systematic but intense health information, education and communication.

Context

Hypertension is a risk factor for developing cardiovascular diseases such as heart attack or stroke [1,2]. It has been noted that non-communicable diseases such as hypertension, which was of affluent countries, is now increasingly emerging among Africans [1]. Even among Africans, White South Africans are less affected than indigenous Africans [3].

Revolutionary changes in the mode of living and extensive epidemiology investigation have shown that hypertension is one of the commonest cardiovascular ailments in Africa and this increases with age [4,5]. Increasing trends of hypertension among Africans mean that ~10–20 million people may be affected in sub-Saharan Africa alone (for instance see [6]). The African Union has fingered hypertension as one of its challenges after AIDS [7]. It is worth noting that the identification of major risks factors of Cardiovascular disease (hereafter referred to as CVD) such as hypertension through population-based studies, education and effective control strategies has contributed to the fall in CVD mortality rates (inclusive of strokes and coronary deaths) in developed countries while in developing countries such as in Africa CVD remains a burden [8].
In the second half of the 20th century, most developing countries experienced a major surge in life expectancy [9]. This was due to how public health responses impacted infancy death, childhood and adolescence and to perinatal, infectious and nutritional deficiency disorders and improved economic indicators [10]. The downside to this phenomenon is that the increasing longevity provides longer exposure to the risk factors of CVD and other chronic lifestyle-related diseases.

The emergence of CVD in developing countries of which hypertension is the cause, during the past few decades, has not attracted proportionate academic and political comment resulting in little public response [11]. The emphasis has been on the eradication of under nutrition in children and infectious diseases. Under nutrition can retard growth and development, reduce physical activity, impair resistance to infection, increase morbidity and lead to disability and death [12].

While under nutrition has been documented as a problem in children, especially those living in rural areas, ongoing public health discourse suggests that CVD affects all age groups but the disparity between developing countries (46.7%) and developed countries (26.5%) is a matter of concern [13]. Fuentes et al. [14] attribute the burden of non-communicable diseases like hypertension in Africa to the demographic transitions and changing lifestyles among its people. Research has proven that non-communicable diseases have their root cause in unhealthy lifestyles or adverse physical and social environments (for example see [14,15]). Major risk factors like unhealthy eating over a period of time, smoking, physical inactivity and excessive use of alcohol are causal factors of hypertension [15].

There is another dimension to the root cause of hypertension as argued by the Joint National Committee [16], Sinaiko [17], Sinaiko et al. [18], Lauer and Clark [19] and Simons-Morton [20] that it extends back to childhood. This resonates arguments that elevated blood pressure (BP) in childhood often correlates with hypertension in early adulthood hence the need to track BP in children. While we do not distinguish between children with CVD and adults, childhood–adulthood continuum makes it imperative to monitor children suffering from CVD before they get to adulthood. We are not alone in this thinking because Simons-Morton et al. [21] have already indicated that children with upper distribution of BP are at risk of developing hypertension in adulthood.

### Genetics

The genetic make-up of an individual could explain the occurrence of hypertension, whereas environmental factors such as diet could be of less importance to the causes of hypertension (for instance see [22]). However, studies done by Appel et al. [23] and McCarron et al. [24] indicate that dietary factors not only significantly lower BP but also nutritionally balanced meals could control or improve multiple risk factors for patients with CVD. McCarron [25] recommends some consideration in the control of dietary intake and if well managed, it can prevent CVD whether hypertension is of genetic or environmental origin.

There are dietary factors that can be risk makers and can contribute to the aetiology of hypertension. Voster et al. [26] study of black South African children identified deficiencies in vitamin A, iron and folic acid—which are risk makers—that could contribute to the aetiology of hypertension in children. However, they acknowledged that more research is needed on causal dietary factors of hypertension in black children as their sample size might not have been representative of other children in other African countries.

Results from the study of Simons-Morton et al. [21] on children with elevated low-density lipoprotein cholesterol indicate that dietary calcium (Ca), fibre and fat may be important determinants of BP level in children, contrary to what Morris and Sacks [27] found in their study. The latter authors found in their controlled trial that modest BP-lowering effects of diets were higher in the ratio of polyunsaturated to saturated fat. However, later studies (i.e. [28–32]) have shown that there is correlation between hypertension reduction and nutrients.
Folic acid has shown to be beneficial and very effective in reducing plasma homocysteine levels and it contributes to the lowering of BP [33] and [34]. The genetic make-up of an individual explains 20–60% of the occurrence of hypertension, whereas environmental factors such as diet are much less important and only account for between 0–16% of the causes of hypertension [22]. Another hypothesis states that adverse intrauterine influences such as poor maternal nutrition can result in impaired foetal growth, resulting in low birth weight, short birth height and small head circumference [35]. Baker mentions that to understand the effects of foetal malnutrition, more should be known about underlying cellular and molecular mechanism of factors limiting nutrients and oxygen to the foetus and its susceptibility to later risk of non-communicative diseases like hypertension. Baker’s research ties in well with Sinaiko et al. [18], which concludes that the foetus develops adaptive metabolic and physiological responses that facilitate survival. These responses may lead to disordered responses to environmental challenges; this is because, as the child grows with increased risk to glucose intolerance and hypertension in later life, it is more likely to suffer from adult CVD. Next, we take a cursory look at the relationship between nutrition and urbanization.

**Nutritional transition and urbanization**

Nutrition underlines many of the public health problems and societal challenges in developing countries today [36]. The determinants and changes in dietary patterns and nutrient intakes in countries have been the subject of discussion in academia. The reason may be that nutrition transitions could influence health outcomes that could lead to appropriate and relevant intervention programmes [37]. Hypertension epidemics among Africans reflect globalization, which is a driving force towards nutritional transition [38]. Globalization has facilitated free movement and exposure to global market economy which has translated in the shift from traditional low-fat foods and rich in fibre to meat and dairy products with high levels of saturated fats and more highly refined foods [39,40] with high salt content and its implications as we will soon discuss.

Unplanned movement of people from rural areas to urban areas in search of work and better life accelerates changes in traditional diets and lack of physical activity [8] due to modes of transportation [26]. Voster et al. further argue that the changing lifestyle—ready access of tobacco products and high-fat foods—expose people to risk factors in non-communicable disease such as hypertension. As people move to urban areas, they tend to be more affluent and their westernized diets would include fried sausages, deep fried fish, fried liver, French fries, eggs and chicken pieces and cakes, contrary to the healthy eating habits in rural areas [40]. Foods consumed by these people indicate a high fat intake, which can contribute to risk factors such as obesity and hypertension [41].

The role of diet in the development of atherosclerosis and coronary heart disease is well known from animal, clinical and epidemiological studies (for example see [42]); increased risk among urban populations due to globalization has created an environment that promotes consumption of food rich in fat and sugar [43]. South Africa for example has become an important African market for Coca-Cola and is one of the largest in the world. In discussing coronary heart diseases in that part of the region, we cannot lose sight of the high sugar concentration and fat as risk factors associated with these products.

Chopra and Puone [44] identified in their cohort study dietary practices in Cape Town, which are contrary to healthy eating. In their observation, the people had limited knowledge about nutrition and one member of the group was quoted as saying, 'people who boil food are not civilized. Fried food is attractive and tasty such as “Kentucky fried chicken”. If your neighbour boils food people say she is still backward because the food does not taste nice nor look attractive'. The above thinking and lifestyle may account for co-morbidity diseases such as hypertension in black adults than their white counterparts [45,46].
Role of salt, potassium and other (un)healthy derivatives

It has long been established that BP lowering, based on dietary salt reduction, is an effective means of CVD prevention [47]. Similar studies [48,49] have also found that salt substitutes with reduced sodium and added potassium (K) lower BP, a view also held by Charlton et al. [50].

Whereas we do not dispute the view from Nan et al. [51] that most dietary salt comes from foods cooked at home, we have seen on a small scale, ad hoc practices where raw salt is added to home-cooked meals before they are consumed in a manner that the quantity of salt added is likely to exceed World Health Organization’s recommended daily salt intake of a maximum of 6 g d^{-1} [50]. When asked why they add additional salt to a cooked meal, the answers shift from biochemistry to a sociological response [52]. In other words, making available additional salt (Na) during mealtime is a socio-cultural issue; it has to do with ‘good taste’ vis-à-vis the proportion of salt content in the food (see [53–56]). Public health education may have to tap into this sociological notion in order to stop or reduce such practices. Some authors [50,57] have advocated for reduction in sodium (Na) in commonly consumed foods such as bread and instead increased magnesium (Mg), K and Ca that will reduce BP significantly in (South) Africans with hypertension.

In practicalizing the above suggestion, public health administration in our social context is likely to encounter four issues: (i) political will of bureaucrats to make appropriate legislation to effect action [58], (ii) neo-liberal resistance to profit reduction measures [59,60], (iii) behaviour change [61] and (iv) working with food certification boards or agencies at national level to regulate local food industry [62].

Multinational corporations operating food production chains, mainly found in urban cities, have profit motivation as an underlying principle. Any intervention that leads to reduced profitability will have corresponding effect on government revenue, which sometimes weakens government position [63]. Public health is sometimes caught in this political and economic spiral in a way that, in some countries, it is badly twisted, battered and stretched far beyond its limited resources. The macro-effect of this situation makes advocating eating plans unrealistic in a region where food security is an issue [64,65]; these are unhealthy derivatives for hypertension reduction. By this, we are not in anyway suggesting that governments cannot make public health systems effective in Africa. We agree with the suggestion from Appel et al. [23] that public education and campaigns on dietary foods rich in fruit, vegetables and low-fat dairy products should be stepped up as part of the effort to reduce BP. This is significant because of low Ca and Mg intake among black Africans [66]. Next, we explore some common perception held by Africans in relation to diet and body weight, which may predispose hypertension.

Common perceptions, diet and body weight

Common perceptions and beliefs about body weight are challenges to nutritional interventions [67]. Food in some African countries is associated with status; social gatherings tend to encourage self-indulgence [68]. On many occasions, the food tends to be high in fat. These may include meat, animal fats, chocolates, biscuits, soft drinks and fried foods. There is evidence [69,70] that point at African adults who see larger body size and overweight as not an issue, especially, in women who are less likely to be pressurized by men to be thin and are less likely to aspire to be thin [71]. However, younger women and those with high levels of education are aware of, and aspire to, the slim body shape [72]. A national survey done by Mvo et al. [68], Poune et al. [69] and Faber and Kruger [71] indicate that moderately overweight women are perceived by their community as attractive and that this is associated with respect, dignity and affluence. A combination of poor environmental conditions with lack of facilities and attitudes towards thin people seems to contribute to low levels of
physical activity not only among South Africans but also among other Africans in general [73].

Lack of physical activity in urban areas underlayed by dietary tendencies poses significant risk for hypertension and type 2 diabetes mellitus [69]. In addition, stroke is a major public health concern among Africans because of increase in hypertension. In deed, increases in total fat and animal protein intakes are associated with increases in Body Mass Index (BMI) of men and women and high cholesterol [74]. When compared with White urban women BMI and body composition, ‘black’ women have a higher degree of insulin resistance on the onset of hypertension and higher post—absorptive free fatty acids [75]. This calls for radical rethink at both individual and society level.

**Barriers to interventions**

As previously stated, social, economic and cultural factors impair the control of hypertension, diabetes, obesity, tobacco use and other risk factors for CVD in Africa. Most African countries cannot afford extensive health care services to eradicate CVD epidemic [76]. The rate of CVD incidences in Africa, if not checked, is likely to put strain on individual, family and government finances (see [39]); large stocks of medicine may also not be available to match the scope of the disease. The few that is available will not be sufficient to go around the entire health system. This puts pressure on national budgets and scarce resources. Our suspicion is that governments in their desperation to make health sustainable will resort to policies that put poor people at further risk. Hypertensive patients who cannot afford orthodox medicine or pay for health care are likely to seek alternative medications such as doubtful herbal preparations that may compound the problem. This is not to say that herbal medicines are not effective. In fact, Bahgat *et al.* [77] have investigated the use of herbal extracts in controlling hypertension and found that some extracts show good prophylactic as well as curative effect against N(G)-Nitro-L-arginine-methyl ester- (l.-NAME)-induced hypertension.

Conceptually, herbs are considered to be nontoxic by the general public due to their natural origin. What we are concerned about is herbal preparations capable of producing prominent adverse health effects due to poisonings. Jou-Fang [78] has warned that clinical toxicity of herbs may vary from mild to severe and may even be life threatening. He mentions the difficulties involved in handling poisons (in clinical settings) as: (i) difficulties in the identification of the proprietary substances and active ingredients, (ii) problems with characterizing the kinetic pattern and toxicological effects and (iii) the uncertainty of the treatment.

The emergence of what some authors e.g. Walker and Segul [36] call the dual burden on households is a result of the nutrition transition in African countries that are becoming more prosperous and urbanized. These countries are seeing a decrease in physical activity levels and a shift in diets to include more fats and sugars [36]. With globalization of food markets, African countries, to a large extent, have larger quantities of low-cost high-calorie foods, which if democratically managed will go a long way to help alleviate some of the problems posed by nutrition deficiency.

While we agree with United Nations Children’s Fund that ‘staple food available at the national, regional and household level can bring profound nutritional change and that primary prevention through a population-based lifestyle-linked programme, as well as cost-effective methods for detection and management is synergistically linked’, it is not enough to think that persuading poorer households to purchase ‘cheap’ foods will address nutritional problems as Popkin *et al.* [39] would want us to believe. It is one thing making food available and it is another putting the food basket on the table. The later is poverty related.

Poverty is multifaceted; one of its effects is hunger, which afflicts one in five of the developing world’s people, assaulting children and individuals especially among African rural populations [79]. The view from Atinmo *et al.* that ‘poverty is an obstacle to social, political, and economic progress; chronic hunger increases one’s susceptibility to disease, hinders learning ability, and leaves one weak and
unable to work and meet family needs’ (page 40) is a concomitant reflection of what pertains in a large swathe of Africa. In fact, the relationship between Socioeconomic status and health is well documented (see for instance [80,81]). To emphasize an earlier point, we argue that because people are poor they tend to live ‘basic’ lifestyles some of which can be detrimental to their own health and well-being (for example see [82]). Although this paper is about Africa, we lend credence to other studies (i.e. [83]; p. 1147), which was conducted among Aboriginal people living in a different social context to show that people living in poverty are associated with high rates of CVD and CVD risk factors. This situation is not uncommon among Africans under similar conditions. For such, it is about ‘eating to survive’ rather than ‘eating to be healthy’.

There is value in stating that poverty is not the only predisposing factor to CVD; rather, there are important psychological factors as described by Malan et al. [84]. There are other factors such as lack of awareness. For instance, Edwards et al. [85] argue that only 20% of hypertensive subjects in Tanzania were aware of their condition unlike in Ghana where 34% of the 1337 subjects studied knew of their condition [86]. The low awareness of hypertension can partly be attributed to how public health is positioned in national discourse. Parallel to this thinking is a lack in national or regional studies on the role of public health education and campaigns on hypertension in Africa. This is a gap in the literature. The closest the authors are aware of is Livingston’s [87] appraisal of health education in the Caribbean.

Conclusion

If the aim is for African countries and its people to address problems of CVD then there is value in stating that inequalities in incomes will reflect inequalities in health and its increasing dichotomy in socioeconomic status [36]. Preventing hypertension should be a priority from early stages of economic development together with population level and personal interventions for BP and cholesterol. This will require special attention from governments of different countries within the African continent and including all stakeholders. Before implementing nutritional interventions through coercive measures, governments should show political will and commitment to proposed interventions. Perhaps the starting point should be recommendations from James et al. [88] that call for rethinking optimal nutritional needs, be it daily requirements of micronutrients set at levels that will prevent deficiency and also prevent chronic diseases.

Africa has 11% of the World’s population and 24% of the World diseases, 3% of the World’s health care and 1% expenditure [89]. The abysmal low expenditure on health care cannot be divorced entirely from its economic and financial equation. This means that gross domestic product of its citizens may not be adequate enough to afford a luxurious health care system. These conditions will require negotiations of complex political, social, economic and cultural hurdles to be cleared. Existing health care infrastructure therefore needs to be reoriented to meet the challenges of CVD. This can be done by a multi-sectoral activity rather than limiting it to the health sector; removing all barriers to prevention such as streamlining competing priorities; improving epidemiological data collection, storage and usage; putting in place Sustainable, Measurable, Attainable, Reliable and Time-bound (SMART) health policy blueprints rather than health policy frameworks and closing the gap between health policy-makers and media while empowering African communities through health education.

There is no doubt that African countries face challenges of designing appropriate programmes to address under and over nutrition jointly [90]. In that case, the emphasis should be on promoting and preventing rather than curative services even in countries with limited health budgets (see also [91]).

The way forward

From the discussion, the following six key points sums up its major thrust that are as follows:
References


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T.K.G.’s research interest transcends disciplinary boundaries—sociology, development and health education and communication; the interface between law and policy and human rights law. He has expertise in information, education and communication (IE&C). He is the Editor of ‘Contemporary Discourses on IE&C Theory and Practice’. R.G. is a postgraduate student in public health. She is a professional nurse and a public health practitioner with many years experience in Africa.
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