Nutrition among Older Adults in Africa: the Situation at the Beginning of the Millenium

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ABSTRACT Most Africans enter old age after a lifetime of poverty and deprivation, poor access to health care and a diet that is usually inadequate in quantity and quality. However, nutrition interventions in African countries are directed primarily toward infants and young children, as well as pregnant and lactating women. Our aim in this article is to synthesize what little is known about the nutrition of older adults in Africa. In particular, we focus more attention on this group.

The lack of attention to the elderly in policies and programs is mirrored by the paucity of information from research studies on their condition. The scant information that is available suggests that the nutrition problems of the elderly are sizable. Given that the older population in Africa is rapidly increasing (1), researchers and policymakers would do well to focus more attention on this group.

Our aim in this article is to synthesize what little is known about the nutrition of older adults in Africa. In particular, we review two broad areas of research: 1) the nutritional status of elderly Africans, in terms of both under- and overnutrition, and 2) the social and economic determinants of undernutrition among the aged in Africa. We choose these areas because they form the core of a problem statement on elderly nutrition, a key starting point for designing nutrition policies and programs for this group. As will be seen throughout, there are substantial gaps in the literature. A final section outlines some suggested future research and policy priorities.

Nutritional status of elderly Africans

Data on the nutritional status of older Africans is sparse. While the bulk of nutrition problems are due to dietary inadequacies, increasingly, problems of overnutrition associated with the nutrition transition are seen among some segments of the population in some countries. This section begins with a review of studies on undernutrition, organized by type of nutritional indicator.

**Anthropometric status.** In 1992, the London School of Hygiene and Tropical Medicine, in collaboration with HelpAge International, began a program of research on the nutrition of older people in developing countries. Two sites in Africa were researched: a Rwandan refugee camp in Tanzania (2) and rural communities near Lilongwe, Malawi (3). Using a BMI cut-off of 18.5 (4), the prevalence of undernutrition in both countries was higher in men than women, ranging from 19.5% in Tanzania to 36.1% in Malawi among men and from 13.1% in Tanzania to 27% in Malawi among women. The prevalence of undernutrition in elderly refugees in Tanzania was lower than that found in another study of older refugees in Algeria (25% for men and 11.5% for women) (5). This discrepancy is probably explained by the fact that the subjects who had reached the refugee camp had already been there for...
a year at the time of the survey, during which time relief agencies had been providing food.

It has been suggested that conventional BMI reference values may not be appropriate for identifying poor nutritional status in elderly people, because of changes in body composition and kyphosis. The mid-upper arm circumference (MUAC)\(^3\) is an easy-to-perform measurement that requires only a tape measure. The London School group demonstrated that an arm circumference cut-off of 21.7 cm had 86% sensitivity in relation to a BMI cut-off of 16 (i.e., severe undernutrition) in the two African samples (6). The researchers proposed MUAC as an alternative to BMI as a screening tool, particularly in the acute phase of an emergency (See Table 1). Interestingly, undernutrition, as measured by MUAC, was associated with functional ability—including handgrip strength, psychomotor speed and co-ordination, mobility, and the ability to carry out activities of daily living independently—in both the Tanzanian and Malawian sites (7,8).

A nutrition survey conducted in pastoral and agro-pastoral areas in Ethiopia, in which the majority of the population currently depends on food aid from donor agencies, found that 77.3% of a sample of 220 elderly subjects aged Þ55 y were categorized as being undernourished (9). Most notably, 46.8% of elderly had MUAC values indicative of severe undernutrition.

Using three anthropometric indices (and/or low serum albumin concentrations), a study of 201 low income elderly women living in slums and poor urban areas in Nairobi, Kenya, found a prevalence of marasmic-like protein-energy malnutrition (PEM) of 10.4% (10).

Biochemical and hematological indicators. Using other indicators of nutritional status, a study conducted in three areas in Zimbabwe (two rural and one urban; n = 278) in community-dwelling subjects aged 60 y and older found that almost a quarter (23%) of subjects were anemic (Hb <13/g/DL in men and <12 g/DL in women); 3% had microcytic anemia and 20% had macrocytic anemia (11). Red blood cell folate levels were low in 30% of subjects, while 13% had low serum vitamin B-12 levels.

Dietary intake. In South Africa, black seniors have been shown to have a low energy intake. In a sample of elderly living in informal settlements in peri-urban Cape Town, over a quarter (27%) of men and over a third (36%) of women had energy intakes <67% of the RDA, a cut-off often used to indicate a low intake (12). Micronutrient density was inadequate and was explained by the low mean intake from the vegetable and fruit group of <2.5 servings a day. Although three-quarters of the sample had consumed fruit and/or vegetables in the 24-h period prior to the survey, only 20 and 26% had consumed vitamin C–rich or carotene-rich sources, respectively.

In the Nairobi study that found marasmic-like PEM, protein intake was low in all women—40.8 (±1.7) and 51.6 (±2.4) g/d in slum and poor areas, respectively (10). In subjects with PEM, a mean of only 6g protein/d was of high quality, with vegetable and cereal sources providing the remainder (48 and 36% total protein, respectively).

An investigation of dietary patterns in the Zimbabwean group mentioned above found that the staple diet was maize meal and vegetables, and that 27% of subjects ate a protein-containing meal less than once a week (11).

Overnutrition and risk for chronic diseases of lifestyle. Evidence of the “nutrition transition,” whereby diets high in refined carbohydrates and fiber are replaced by diets containing a higher proportion of fats, particularly saturated fatty acids, and sugars (13,14), can be seen in Africa as well. Data from a study conducted in almost 1,000 individuals in informal settlements on the outskirts of Cape Town in 1990 demonstrated an association between duration of life spent in a city and percentage of energy in the diet supplied by fat (15). The ratio of protein, fat and carbohydrate to total energy intake provides an indication of the atherogenicity of the diet and identifies a population’s position in the nutrition transition. In this regard, the available data for older South Africans suggest that elderly white South Africans have a high fat intake (>35% E) (16), while elderly of mixed ancestry have an intermediate fat intake (32% E) (17) as compared with a low fat intake in black elderly (24–26% E) (12,18,19).

Regarding overnutrition, urban-rural differences in the prevalence of obesity have been shown in older South Africans. Obesity (BMI ≥30) has been shown to be fourfold higher in urban black women in Cape Town than in women in a rural area (12). Differences are seen in the prevalence of other risk factors for chronic diseases of lifestyle when comparing the results of various studies of elderly South Africans. Favorable lipid profiles (i.e., low levels of total serum cholesterol and HDL:total cholesterol ratios of >20%) are seen for the black elderly population, which probably reflects their lifetime exposure to a low fat intake, whereas older white South Africans have a high cardiovascular risk (20) (Fig. 1). Black elderly who speak different languages and who live in different parts of the country have different lipid profiles. In Cape Town, Xhosa-speaking black elderly (20) had a more protective lipid profile than Sesotho-speaking black people of a similar age in either an urban (Manguang) or rural (Qwaqwa) area (21).

Unexpectedly, the urban Cape Town sample also had a markedly lower prevalence of hypertension (≥160/95 mmHg) of 38.8% (when age- and sex-standardized to the 1991 census data for the population aged ≥60 y) than reported for either the urban Manguang (70.6%) or the rural QwaQwa (56.7%) groups. The differences in hypertension could not be explained by differences in the prevalence of obesity between the groups. This suggests that differences may exist in the cardiovascular disease risk profiles among various black South African populations, even given comparable living conditions and lifestyles. Studies are currently underway to investigate the genetic predisposition of various African groups to salt sensitivity.

In summary, there are substantial gaps in our knowledge of the nutritional condition of older Africans. Much of what we know comes from scattered studies in diverse populations. Available data indicate serious problems of both undernutrition, including energy and protein deficiency, as evidenced by both anthropometric and dietary indicators, and micronutrient deficiencies, as evidenced by biochemical and dietary measures. The provision of nutrition services to elderly people in urban areas is complicated by the apparent double burden of nutrition-related disease. On the one hand, there is evidence of energy and micronutrient undernutrition in older adults, while, on the other hand, there is evidence of high risk for chronic diseases of lifestyle in certain groups. Coupled with this complex situation is the current prioritization of other sectors of the population, namely women and children, for the targeting of nutrition services.

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\(^3\) Abbreviations: MUAC, mid-upper arm circumference; PEM, protein-energy malnutrition; NGO, nongovernmental organization; OAU, Organization of African Unity.
Determinants of poor nutritional status in older Africans

There are a number of basic and underlying determinants of undernutrition among the elderly. Here, we focus on three important determinants in the African context: household food insecurity, war and famine, and the indirect impact of HIV/AIDS.

Household food security. Household food insecurity, through its effect on dietary intake, is an underlying cause of undernutrition in Africa. There is limited information on the food security situation among the elderly in Africa, but some insights were obtained recently from an analysis of food expenditure data in South Africa. Results showed that 43% of South African households experienced food poverty in 1995 (24); food poverty was defined as household food spending less than the cost of a nutritionally adequate subsistence diet. Subsequent analyses, reported here for the first time, showed that 50% of elderly households (age of head $\geq 60$ y) were in food poverty, compared with 40% of younger households ($P < 0.05$). Dramatic differences in food poverty were evident according to ethnicity and age of household head, with black elderly-headed households having the highest food poverty rates of all groups (65.4%) (Fig. 2).

Food poverty rates were higher in rural compared with urban households. For black households of five persons, food poverty rates in rural and urban areas were 71.2 and 61.1%, respectively, for elderly-headed households compared with 63.1 and 47.9%, respectively, for younger households. In both urban and rural black populations, small households (1–2 persons) headed by the elderly had lower rates of food poverty compared with those headed by younger adults ($P < 0.001$). Opposite trends were seen in larger households, i.e., those with three or more people.

This study highlights the important role of household context in understanding the nutrition problems of the elderly. Effective nutrition interventions will need to take into account social and demographic factors such as household size, urbanization and race.

Famine, war and natural disasters. In Africa, population growth rates already exceed those of food production in most sub-Saharan countries, forcing them into food crises whenever bad weather, civil unrest or war strikes (25). The effects of seasonal changes in food availability on the nutritional status of 41 elderly subjects living in smallholder rural households in Kenya was investigated over a 15-mo period (26). Large interseasonal changes in body weight were demonstrated, in which the men had a mean weight loss in the lean season of 4 kg ($\sim 7\%$ of total body weight) compared with 1.7 kg in women (3% body weight). The authors concluded that older people who rely on their own land for food availability are likely to suffer high nutritional stress during periods of heavy physical activity and seasonal food shortages.

The number of refugees and internally displaced persons grew by 40% between 1990 and 1993. The United Nations High Commission for Refugees has estimated that, on average, 10% of refugees are over 60 y old. On the African continent, war and civil strife are prime causes of population displacement and food shortages, which affect large numbers of people in a geographical area. Older adults are a particularly vulnerable group in unstable conditions, yet consideration of their health and nutritional status is often overlooked and relief efforts are targeted toward young children. In Bosnia-Herzegovinia, undernutrition was not found in children; however, the prevalence in older adults was 10–20% (27). This information suggests that older people may forgo their food rations in favor of younger relatives or may have increased requirements due to underlying disease.
HIV/AIDS. Of all world regions, the largest impact of the AIDS pandemic has been in sub-Saharan Africa. In 21 countries in the sub-Saharan region, >5% of the urban adult population is HIV positive. Severely affected countries at present are Namibia, Swaziland, Zambia and Zimbabwe: 19–25% of all adults in these countries are HIV positive. Projected declines in life expectancies that take AIDS-related mortality into account in the southern African region have demonstrated declines from 62 to 40 y in Botswana, from 65 to 56 y in South Africa and from 56 to 37 y in Zambia (28).

The AIDS epidemic in sub-Saharan African countries has been called the "grandmother's curse" (29), because it is the grandmothers who must care for adult children with AIDS, as well as for grandchildren who have AIDS or who have been orphaned. In Zimbabwe, in 1997, 43% of households with AIDS orphans were headed by a grandmother (30). Information from Kenya has shown that households with AIDS orphans that are headed by grandmothers typically suffer abject poverty and usually fall below the poverty line (31). The potential devastating socioeconomic and demographic impact of the AIDS epidemic, together with the psychosocial burden of caregiving, loneliness and bereavement associated with the outcomes of the disease (32), is likely to be a major determinant of health status, including nutritional status, in older Africans.

**Future research and policy priorities**

The scarcity of data highlighted by this article indicates an urgent need for research in a wide range of areas to inform nutrition-related policy development for elders in African countries. Surveys describing the nutritional status of older adults on the continent are mostly small and slanted toward individuals expected to be at highest risk, such as refugees and displaced persons. Longitudinal data relating the process of aging to lifestyle factors, including dietary intake patterns, are nonexistent. The lack of institutionalized care (for example, only 0.1% of elderly South Africans reside in old-age homes), together with multigenerational households being the most common and culturally acceptable living arrangement, means that most African elderly are community dwelling. The notable lack of systematic studies on nutrient and food intakes in this group limits the development of appropriate community-based strategies to improve nutritional status. Furthermore, the likely heterogeneity of elderly people in different settings both within and between countries requires cross-country comparisons of the impact of nutritional status on health outcomes, using standardized methodology. In this regard, a Minimal Data Set project on Aging, which will include nutritional variables, is currently being initiated by the World Health Organization in four African countries.

The development of valid and reliable, but simple-to-administer, instruments is needed to screen for risk of malnutrition. Identification of the most appropriate anthropometric indices and accompanying reference values to use in the determination of either under-or overnutrition in this age group requires an extension of the type of surveys that have been conducted in Malawi and Tanzania by researchers from the London School of Hygiene and Tropical Medicine. In these studies, measurement of MUAC has been shown to be a sensitive indicator of undernutrition and is able to predict functional status, particularly handgrip strength.

Regarding micronutrient status, in developed countries there is a rapidly changing paradigm from the prevention of deficiency states to the maintenance of an optimal status in the elderly, particularly for the role of folate, vitamin B-12 and vitamin B-6 in homocysteine metabolism and cognitive function. The micronutrient status of older Africans is largely unknown; however, it would be expected that the typically low animal protein and low nutrient-dense dietary patterns would result in inadequate intakes. Indeed, folate deficiency has been identified as the primary cause of anemia in institutionalized elderly Zimbabweans. Unlike the U.S., no African countries have adopted the mandatory fortification of grain products with folate. This area of research should be considered high priority, considering the rapid urbanization trends and demographic transition taking place and the relative safety and cost-effectiveness of either fortification or supplementation with water-soluble B vitamins.

In Africa, the elderly are not considered a priority for targeting of nutrition interventions, so it is not surprising that the effectiveness of different types of nutrition interventions has not been described in this population. Only a handful of nutritionists are working with older people in African countries, and there are even fewer practitioners conducting high-quality research in the field. Indeed, apart from emergency relief and supplementary feeding programs, including luncheon clubs operated by volunteer or donor organizations, little else has been attempted. Outcome measures of effectiveness should include improvements in physical and cognitive functional ability, as well as cost savings related to medical care and utilization of limited health care resources.

On a positive note, HelpAge International has launched a program of training and advocacy aimed at nutritionists and nongovernmental organizations (NGOs), with a coordinator based in the Kenya regional office. Another notable landmark is the recent development of a draft Policy Framework and Plan of Action on Ageing by the Organization of African Unity (OAU), drafted after a meeting of experts from 27 OAU member states in November 2000 (33). This effort is an attempt to guide OAU member states in the design, implementation, monitoring and evaluation of their own appropriate national policies for the elderly. "Food and Nutrition" has been identified as one of twelve key areas in the draft policy document, which will be presented to the 37th Session of Heads of State and Government in July 2001 for official adoption and endorsement. For successful implementation of any such policies on aging, intersectoral cooperation between ministries of Health and Welfare, as well as NGOs and aid agencies, is required. The integral existence of informal ser-

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**TABLE 1**

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<th>Sub-Saharan Africans or Latin-American/Caribbean people of African origin (both sexes)</th>
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1 Data derived from Ismail and Manandhar (6).
VICES, SOCIAL SUPPORT NETWORKS AND KIN SUPPORT NEEDS TO BE ENGAGED, AND PUBLIC-SECTOR FINANCE NEEDS TO BE MADE AVAILABLE TO SUPPORT THESE SYSTEMS.

IN CONCLUSION, OPTIMAL NUTRITION IN THE ELDERLY HAS IMPLICATIONS FOR IMPROVING THEIR HEALTH STATUS AND GENERAL WELL-BEING, AS WELL AS FOR REDUCING THE BURDEN ON LIMITED HEALTH CARE RESOURCES. THE CHALLENGE IS TO IDENTIFY AND TACKLE THE BASIC AND UNDERLYING CAUSES OF POOR NUTRITIONAL STATUS IN OLDER ADULTS IN AFRICAN COUNTRIES, WHICH MAY DIFFER FROM COUNTRY TO COUNTRY.

LITERATURE CITED