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The double burden of malnutrition : a study of food security, physical activity and nutritional status among women and children in Narok County, Kenya

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Summary

There is a growing concern over the increasing number of overweight people in developing countries particularly in Africa. The increase in the prevalence of overweight and obesity in developing countries is largely attributed to lifestyle changes that are consistent with countries in transition. With the changes in dietary patterns and reduced physical activity, there is an increase in numbers of overweight and obesity particularly among the poor and the urban and rural populations. Physical inactivity has been reported in many developing countries, particularly in Africa among the urban populations. The nutritional status is changing in many developing countries from persistent underweight, stunting and wasting to overweight and obesity among children and adults and now frequently a combination of under-nutrition and over-nutrition is observed resulting in a situation that is now commonly referred to as the 'double burden of malnutrition.' Under-nutrition, particularly stunting, has also been known to result in overweight later in life.

The aims of this thesis therefore were to determine the prevalence and risk factors of malnutrition (overweight, stunting, wasting and underweight) among children, to assess food insecurity and its effects on maternal and child malnutrition, to assess physical activity, water turnover and body composition and their impact on maternal nutrition and to assess physical activity and food insecurity among pregnant women and their impact on pregnancy outcomes.

During the literature review also a systematic review was carried out to assess determinants and prevalence as well as risk factors for overweight, stunting, wasting and underweight among young children in sub-Saharan Africa. We carried out a study to assess the prevalence of overweight as well as stunting, underweight and wasting among children and also to assess overweight and underweight among women in Narok County in Kenya, located in Rift Valley Province. In addition, we carried out a longitudinal study to determine body composition, physical activity and water turnover among women and also to determine the impact of physical activity and food security on pregnancy outcomes among pregnant women in their second and third trimesters in Narok County.

The main findings from our review study were that demographic, socio-economic and environmental factors are the major players in determining stunting, underweight and overweight among young children and adolescents. Although nutritional and lifestyle factors are important as mentioned in other studies, they were not significant in the studies sampled. Stunting is a risk factor in early childhood that may result in overweight later in adolescence and adulthood. Promoting exclusive breastfeeding is important in preventing both stunting and overweight among children.

In the prevalence study among our population of children under five in Kenya, mild, moderate and severe stunting were 12.3%, 4.8% and 2.6% respectively, 15.7%,

6.0% and 2.2% for mild, moderate and severe underweight and 16.6%, 5.2% and 4.3% for mild, moderate and severe wasting. Overweight among children was 6.9%. While among women, the prevalence of underweight was 5.6%, overweight was 26.5% and obesity was 9.1%. The food security status among households was varied: Of all households involved 70.1% were categorized as severely food insecure, 21.9% were moderately food insecure, 3.7% were mildly food insecure whereas 4.3% were food secure.

In our study on of body composition and physical activity on water loss among women we found the mean total body water (TBW) as 29.3 ± 4.2 liters and water turnover was found to be 3.2 ± 0.8 liters per day (L/day). Water loss was significantly related to BMI, Fat mass index (FMI) and physical activity. BMI was the strongest predictor of water loss. Water loss increase with increased physical activity and increased BMI. Meeting water requirements among women in Africa is essential for proper normal body functioning in order for them to accomplish cultural responsibilities of caring for household members. Acclimation may play a role in minimizing water loss among individuals in arid areas in order for the body to utilize water well since water loss was more or less similar to those of women in other climatic regions.

In our study on effects of physical activity and food security on pregnancy outcomes, we found food security and physical activity not to be significant predictors of birth outcomes; however, height of the mother was an important predictor of birth weight. Food insecurity was 45.1% among the pregnant women, however those in their 2nd trimester reported severe food insecurity as high as 61.9% compared to the 3rd trimester women whose severe food insecurity was 42.9%. Vector magnitude counts indicated that physical activity reduced in the third trimesters and that all the pregnant women spent more time on sedentary activities as indicated by 51% in the 2nd trimester and 56% in the 3rd trimester.

The results from our prevalence study showed that in Kenya overweight is on the increase. The prevalence of overweight among children under five years of age according to our study was 6.9%, and this is consistent with data reported by the World Bank which estimated the prevalence by 2010 to stand at 5%. Among women in our study population who had a child below 5 years of age, overweight and obesity combined was 35%. Other studies indicate that the prevalence of overweight in the different regions in Kenya varied as a result of varied socio-economic status and climatological conditions that affect the food availability and accessibility. Food insecurity was persistent among the study population confirming the paradox of over-nutrition occurring among the food insecure. Physical activity was low among women in our study confirming the reduced physical activity in countries in transition. The reduced physical activity and change in dietary patterns has contributed to the prevalence of overweight. Although there was no impact of physical activity and food insecurity on preg-

nancy outcome, however, height of the mother was associated with birth weight. This reaffirms the importance of pre-pregnancy nutrition in determining outcomes such as birth weight and height of the infant. Nutritional status of the young women, more so girls is important in predicting future pregnancy outcomes. In terms of regulating water intake, among women living in arid and semi-arid lands, physical activity, body mass index (BMI) and body composition were predictors of water loss, however, BMI was the strongest predictor. Total body water (TBW) among the women in our study was comparable to that of women other studies done in Kenya. Meeting water requirement is crucial for women living in this region also more so because women are the key food providers within a home, thus if their water needs are not met then they can become dehydrated and therefore not able to provide for their families. Other than the body maintaining its water balance, it is important to note the role played by acclimatization by individuals that enables them to cope with the conditions of water shortage without increasing the intake.

In conclusion, food insecurity is still rampant in Kenya in spite of the progress made in economic developments, food production and infrastructure. As a result of food insecurity, under-nutrition has continued to persist especially among children under five years old. In addition, overweight is emerging as a threat to progress made in the area of food access resulting in a double burden of malnutrition. Overweight combined with under-nutrition poses a challenge both to researchers and policy makers as they exist within the same community, among individuals and in the same households. Women and children are the most affected by the double burden of malnutrition. The consequences of the double burden of malnutrition are far-reaching and the end result may be disability or death. Interventions need to be put in place urgently to curb the rising overweight and the persisting under-nutrition.