ORIGINAL RESEARCH PAPER | Social Science | Volume : 6 | Issue : 8 | August 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Dietary Transition from Traditional to Modernization increase Non Communicable Diseases

KEYWORDS: transition, nutritional, dietary, processed, policies

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ABSTRACT *Nutrition Transition is the shift in dietary consumption and energy expenditure that coincides with the economic, demographic and epidemiological changes. Transition of traditional diets high in cereal and fiber to more processed diets high in sugars, fat and animal source food. This shift from traditional diets to Western-style diets has been a key contributor to the obesity epidemic in low- and middle-income countries. International food trade, investment, commercialization and marketing are drastically impacting the availability of and access to energy- dense but nutrient deficient foods causing the aforementioned shift from traditional diet. The forces of globalization are also strongly influencing many lifestyle changes in developing countries. Major changes in economic structures from agrarian economies to industrialized economies are reducing physical activity levels in occupations around the world. The ongoing trend of eating in a more Western fashion has caused increased rates of adverse health and childhood obesity. In order to reduce obesity and its subsequent health and economic consequences, policy will need to be targeted at both the individual and the environment.*

Introduction

Rapid economic growth, urbanization and globalization have resulted in dietary shifts especially in Asia, away from staples and increasing towards livestock and dairy products, fruits and vegetables, and fats and oils. Current consumption patterns seem to be converging towards a Western diet[1,2,3]

Despite substantial economic growth, large inequalities remain in many low- and middle-income countries, and it is common to see problems of underweight, stunting, and micronutrient deficiencies side by side with increasing rates of obesity. This "dual burden" of undernutrition and obesity exists not only in countries and communities[4] but in households[5,6] and even in individuals, who may have excess adiposity along with micronutrient deficiencies, such as iron deficiency anaemia, or stunting and overweight. Dual burden households are most common in countries undergoing the nutrition transition and may reflect gender or generation differences in food allocation related to social norms [6,7] For example, high-quality foods may be given preferentially to adult males rather than to children.

As a result the demand side factors are growing affluence and lifestyle changes, expansion of the middle class, higher participation of women in the workforce, etc. but the supply side factors are closer integration of global economies, liberalization of foreign direct investment, a sharp reduction in freight and transportation costs, and growth of supermarkets and fast-food outlets.

According to FAO 2012, the dietary changes in the past two decades have had both positive and negative impacts on nutrition. On the positive side, the quality of diets at the aggregate global level has improved, and nutritional outcomes have improved in most parts of the world[8].On the negative side, diets increasingly contain more energy-dense, semi-processed foods, saturated fats and sugars. These dietary shifts/changes are associated with an increase in over nutrition and obesity. The latter are causally linked to higher prevalence rates of non-communicable diseases (NCDs) such as diabetes, cardiovascular disease and cancer.

This paper will help in ways of improving public awareness to deal with the potential negative implications of dietary shifts and also useful to policymakers, development practitioners, academics and civil society.

What is Nutrition Transition?

The nutrition transition theory concerns the broad changes in the pattern of human diet that have occurred across time and space.

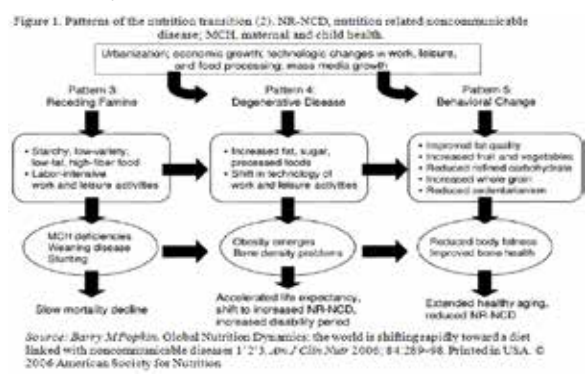

Figure 1. Patterns of the nutrition transition (2). NR-NCD, nutrition related noncommunicable disease; MCH, maternal and child health.

Source: Barry M Popkin. Global Nutrition Dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases 1'2'3. Am J Clin Nutr 2006; 84:289-98. Printed in USA. © 2006 American Society for Nutrition

Modernization, urbanization, economic development, and increased wealth lead to predictable shifts in diet, referred to as "nutrition transitions" [9,10]. This shift toward increased obesity and noncommunicable diseases (NCDs) is only the latest pattern of this transition. Researchers divide the nutrition transition into five patterns from Hunter gatherer to Overeating, Obesity-Related Diseases to individuals change their behaviour and communities promote behaviour changes to prevent these conditions (Chart 1).

Currently, most low- and middle-income countries are rapidly moving from pattern 3 (end of famine) to pattern 4 (consuming more energy-dense diets). This shift from traditional diets to Western-style diets has been a key contributor to the obesity epidemic in low- and middle-income countries.

Demand theory explanation of changes in diet

Demand and Supply are the drivers of the dietary demand

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theory. The factors to Demand are: Market size, Population and income growth, Poverty rate and rate of adoption of income support programs, and Consumers' preferences are the factors of demand. The factors to Supply are: Fixed (investment) cost, Sourcing, sorting and distribution costs and energy and labor.

The theory can be broadly categorised in two explanations. One is the downward shift of calorie curve relies on lower "requirements" due to health improvements, less strenuous activity levels and more sedentary lifestyles[11]. The second alternative explanation is standard demand theory framework, with food prices and expenditure cast in a pivot role. For example, Calories Significant food price effects on calorie demand –negative for prices of cereals , fruits and vegetables, and positive for inferior cereals/ milk/milk products/ghee/butter/vanaspati oil/sugar/ eggs / and pulses/ nuts dry fruits/ others. The expenditure / income effect on calorie demand is positive and large. Household size and composition matter too and more varieties results in more significant negative effect on calorie demand. Whereas in urban areas, the demand function shifted downward overtime, presumably because of less strenuous activity patterns and more sedentary life styles, among other time related factors.

Figure 2. The drivers and consequences of food consumption changes with economic development.

What are the key dietary transitions?

Globally, the diet is becoming increasingly energy-dense and sweeter and the higher-fiber foods are being replaced by processed versions. In the higher-income countries, increased portion sizes, food intake away-from-home, and snacking are eating pattern shifts that accompany these changes[12,13,14,15]. Water and milk appear to be replaced by calorically sweetened beverages[13,16].

Egg, poultry, beef, and pork consumption have increased rapidly in China, and milk intake has recently begun to rise. Today, the average Chinese adult consumes >1300 kcal/d of pork, poultry, beef, mutton, fish, eggs, and dairy foods. For each additional increase in income, adults proportionally increase their intake of animal-source foods[17],[18],[19].

In the United States, calorically sweetened beverages (eg, soft drinks and fruit drinks) account for >50% of the increase in added caloric sweeteners in the past several decades; the foods responsible for caloric sweetener intake in South Africa are much more varied than in the United States[13,20,21,22,23]. Urbanization and national income per capita are correlated highly in the developing countries that have access to processed foods higher in sugar. Urbanization is also linked with greater access to modern mass media, to better transportation systems, and to larger, modern supermarkets dominated by multinational corporations[24],[25]. Although increases in per capita income have occurred, in most cases, hand-in-hand with urbanization, per capita income plays a powerful separate role in food consumption decisions, particularly in relation to the consumption of more processed foods.

What are the major underlying global forces?

The nutrition transition is deeply rooted in the processes of globalization. Globalization is associated with changing incomes and lifestyles. In addition, by radically altering the nature of the food supply chain, globalization is altering the quantity, type, cost, and desirability of foods available for consumption [26].Globalization is driven by series of interacting processes, among which the following are critical in driving the nutrition transition:

- Liberalization of international food trade; shifts in the global food system, which is related to the marketing and sales of food.
- Liberalization of foreign direct investment[27].
- Vast expansion of the global mass media; global food advertising and promotion;
- Emergence of global agribusiness and transnational food companies; and
- Retail restructuring (notably the development of transnational supermarkets).

Globalization of modern food processing, marketing, and distribution techniques (most frequently linked with westernization of the world's diet) an increased opening of our world economy[28, 29].

Supermarkets are large providers of processed higher-fat, added-sugar, and salt-laden foods in developing countries, but they have also been the purveyors of some good. Most importantly, supermarkets have solved the problem of keeping animal-source products chilled and in many instances have brought higher-quality produce to the urban consumer throughout the year.

Global agricultural policies: Global agricultural policies have a built-in long-term focus on creating cheaper grains and animal-source foods.

Health consequences of dietary transitions

"Unhealthy diet and insufficient physical activity are among the major causal factors in coronary heart disease, cerebrovascular strokes, several forms of cancer, type 2 diabetes, hypertension, obesity, osteoporosis, dental caries, and other conditions. Consumption of vegetables and fruit, the amount and quality of fat ingested, and the intake of salt are the most important elements of the dietary prevention of cardiovascular diseases and Globalization, Diets and Noncommunicable Diseases and cancers. Maintaining normal weight and adequate physical activity throughout the life span are the most effective ways of preventing diabetes and many other chronic diseases"[30]. The management of NCDs is extremely costly. Population based prevention is a more efficient solution to tackle the problem.

Policy priorities: Possibilities for altering adverse trends

The changing and unhealthy patterns of nutrition in the world are linked with globalization. Globalization can clearly bring benefits in global alleviation and control of infectious diseases. At present it gives transnational companies a powerful means to promote consumption of foods and drinks that replace healthier traditional food choices. It finds that policies and processes designed to advance the

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globalization of the world economy in the areas of agriculture, trade, investment, and marketing are shaping dietary trends. Thus the policies designed to integrate the global food market matter for what people eat. Dietary outcomes also depend on the socioeconomic and cultural context in which the policies are operating, as well as changes in consumer behavior[26].

Dietary transition where a traditional monotonous diet, which is often associated with nutrient deficiencies, gets more diverse with increasing intake of animal products and decreasing intake of staples, there is a stage when the "rural diet" becomes more adequate but can still remain prudent. This is the stage that is regarded as an optimal diet, which includes plenty of whole grains, legumes, vegetables and fruit and just moderate amounts of animal products[31].

First, policies should be developed with full awareness of the influence of globalization processes and policies on long-term dietary change, and the context in which they operate. Second, policies should address, in some way, the behaviour of transitional food companies, preferably by creating incentives to improve the functioning of markets for healthy foods and disincentives for foods that contribute to unhealthy diets. Third, policies should focus on the promotion of healthy diets over the long term among groups with low Socio economic status. Policies are thus needed to promote healthier economic development. Advise a government of a middle-income developing country about appropriate policies to mitigate the negative effects of the nutrition transition in the context of globalization, taking into account the interests of the various stakeholder groups [26].

Conclusion:

Public health policies that aim to reverse undernutrition for one at risk member of a household, by improving either the energy density of the food supply or food insecurity, might have the undesired consequence of contributing to overweight and obesity in another member of that household[32]. Global research and development are needed to identify successful ways to "de-link" social and economic development from adverse changes in diet and physical activity. Better understanding of Globalization, Diets and Noncommunicable Diseases[33]. Factors affecting changes in dietary intake in the economic and social development of the society and under the influence of globalization will help in planning, implementing, and modifying diet and health intervention programmes for the developing world. These changes will determine in large part the course of cardiovascular disease and other Non-Communicable Diseases epidemics.

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Volume : 6 | Issue : 8 | August 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

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