

Special Article

## Nutrition Transition in Childhood Feeding: Role of Behaviour Change Communication for Mothers in Ensuring Optimal Nutrition in Infancy and Childhood

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### Abstract

**Background:** Globally, dietary pattern and nutritional status in infancy and childhood have also undergone series of major shifts with corresponding nutrition-related diseases; an emerging concept referred to as ‘Nutrition Transition’

**Objective:** This review of literature aimed at synthesizing various documentations and findings from previous studies regarding transition in childhood feeding practices globally and identify associated factors with a view to making appropriate recommendations towards effective strategy in ensuring optimal nutrition during childhood.

**Methods:** Using data obtained from Cochrane, PUBMED and Medline search engines, a review of findings from previous studies was undertaken to identify variations and pattern in nutrition transition in infancy and factors associated with infant feeding practices.

**Result:** Findings showed that the proportion of infants who are appropriately breastfed according to lay down recommendations across regions of the world declined significantly (Centre for Disease Control and Prevention CDC, 2018). This changing pattern in nutrition has also been observed among different income groups in developing countries where the existence of the multiple problems of food insecurity, malnutrition, and related diseases have been reported. Findings also demonstrated an emerging concept known as nutrition transition which involve shift towards diets dominated by higher intakes of sugar, high fats diets and lower intakes of fiber and reduced activity patterns (Popkin, 2006). This changing pattern in feeding practices has been associated with severe nutritional challenges in infancy and childhood.

**Conclusion:** The emerging trend of double burden of malnutrition in childhood comprising of under-nutrition with micronutrient deficiencies observed in developed and developing world predisposes infants and young children to diseases, disabilities and death. Nutritional intervention based on appropriate theory of behaviour change has been suggested as a novel strategy for promoting effective feeding behaviors during childhood.

**Key words:** Nutrition Transition, Behaviour Change Communication for mothers, Infancy, Childhood

### Introduction

The World Health Organization recommends that infants are exclusively breastfed till the sixth months following which complementary diets should be introduced while still continue to be breastfeed for up to two years of age (World Health Organization, WHO, 2003). Studies have shown that the proportion of infants breastfed across regions of the world declined significantly;

for instance, the prevalence of exclusive breastfeeding globally remains about 37%, while in the United States of America, the breastfeeding initiation rates was 83.2%, but less than 50% of these infants were exclusively breastfed through the third months and about 25% were been exclusively breastfed through the sixth months (Centre for Disease Control and Prevention CDC, 2018). The concept of the nutrition transition involves shifts in diet universally toward a diet

dominated by higher intakes of animal and partially hydrogenated fats and lower intakes of fiber and reduced activity patterns which are reflected in nutritional outcomes, such as changes in body composition of individuals (Popkin, 2006). Towards optimal and effective infant feeding from birth, the WHO (2017) recommend that mothers should initiate breastfeeding within thirty minutes after the child is born; infants should be breastfed exclusively for the first six months; and after the first six months, when supplemental foods are introduced, breastfeeding should precede supplemental feedings. Others include breastfeeding on demand, continue breastfeeding even if the mother or the baby becomes ill, avoid using a bottle, pacifiers or other artificial nipples and continue to breastfeed up to two years and beyond. The above recommendations are to ensure adequate nutrition in infancy and early childhood.

### **Methodology:**

#### **Data sources**

Using data obtained from Cochrane search, Google Scholar and PubMed, a review of findings from previous studies was undertaken to identify variations and pattern in nutrition transition in infancy and factors associated with infant feeding practices. This review also identified the prevalence of malnutrition in infancy and its variation globally, across Sub-Saharan Africa.

**Inclusion criteria:** Findings were extracted from studies involving mothers and primary care givers, children under-five, conducted globally and across Sub-Saharan Africa between 2010 and 2018. This review also included findings from National and regional studies on infants' nutrition, growth and developments. Review also included guidelines from World Health Organization (WHO), United Nation Children fund (UNICEF) related to infants and young children feeding. Most studies reviewed employed cross sectional study design and are mostly quantitative.

#### **Results**

Data from UNICEF showed that nearly half of all deaths among children under five globally are attributable to under nutrition and majority of these deaths occurred in Asia and Africa (UNICEF, 2018). The UNICEF global estimate showed that 22.9% of World under-five children are stunted.

Central Africa accounted for 32.5%, Southern Africa, 28.1%, Northern Africa 17.6% and West Africa accounted for 31.4% (UNICEF, 2015).

Findings from Sub-Saharan Africa also showed that malnutrition is responsible for over 41% of the mortalities that occur yearly (approximately 2.3 million) in children aged 6 to 24 months in developing countries with one-third of deaths attributable to nutrition and inappropriate feeding practices which occur during the first year of life (Sandoval-Priego et al., 2003).

Regarding the proportion of infants on appropriate complementary feeding practices, a cross sectional study involving 358 mothers in Nigeria revealed that 30% of infants aged 6-23 months old were fed in accordance with the recommendation for infant and young children feeding (Olatona, F. A., Odozi, M .A., Amu, 2014). Another Nigerian study showed that the percentage of children underweight almost doubles from 14% among children less than six months of age to 26% among older children as a result of inadequate complementary foods after the sixth months of life, thus increasing exposure to infections and susceptibility to illness (Nigeria Demographic and Health Survey, 2013).

The World Health Organization's recommendation on infants and children's feeding stipulates that that mothers should exclusively breastfeed their infants for the first six months and thereafter ensure that the infants receive adequately safe and nutritious foods while still continue breastfeeding until the age of two years or more (World Health Organization, 2019). Several studies reported variations and determinants of factors influencing timing of introduction, quality and quantity of complementary feed given to infants; studies in some developed countries found association between early introduction of complementary feeding and some maternal characteristics such as age, educational status, occupation and marital status, socioeconomic status, pre-pregnant body mass index, place of residence in addition to selected infant characteristics such as gestational age, birth weight, delivery method, order of birth (Kronborg, Foverskov & Vaeth, 2014); (Dashti, 2014).

Regarding recent upsurge in transition in childhood feeding globally, individuals, families, and

communities have been observed making rapid transition from under-nutrition to poor nutrition; a phenomenon now referred to as 'Nutrition Transition'. This emerging trend is also reflected in nutrition and feeding pattern of family diets which may be attributed to the changing nature of globalized food supply, and easier access to technologically processed high fat and sugar foods coupled with more sedentary lifestyles (Oganah, 2014). Recent studies have shown that the proportion of infants who were breastfed in accordance with general recommendations have declined significantly; for instance, a study on transitions in infant feeding patterns across the first year of life conducted in United States of America revealed that the proportion of breastfed infants declined rapidly to 50% among infants 6 months old, 24% among infants 12 months old (Centre for Disease Control and Prevention CDC, 2018).. The study also showed that significant proportion of women fed their infants with formula feed in addition to breastfeeding in the first year of life. The above is similar to the emerging trend in childhood feeding practices among different income groups in many developing countries. Joiner et al. (2006) reported the existence of the multiple problems of food insecurity, malnutrition, and the double burden of disease. Findings have also showed that recent surge in the consumption of infant formula feed is indicative of a wide spread infant and young child feeding transition representing a shift from lower to higher formula infant diets (Baker, 2016).

### Discussion

Diets and nutritional status in infancy and childhood have undergone series of major shifts with its associated changes in the overall patterns of diet with its corresponding nutrition-related diseases (Popkin, 2006). Generally, the trend of dietary changes in the past decades appears to have accelerated to varying degrees in different regions of the world and there are no exceptions to diets during infancy and early childhood. The concept of the nutrition transition entails wide spread shifts in diet and activity patterns. These changes are reflected in nutritional outcomes, such as changes in average stature and body composition of infants and young children observed globally in recent times. This is in consistent with the submission

that dietary and activity pattern changes are paralleled by major changes in health status and by major demographic and socioeconomic changes (Oganah, 2014).

Nutrition transition is characterized by a shift from the relatively monotonous diet based on indigenous staple grains or starchy roots, grain legumes, vegetables and fruits, and limited food of animal origin, to more varied diets of processed foods, more foods of animal origin, more sugar, fat, and alcohol (Popkin, Horton & Kim, 2001), that is, a shift from traditional to modern meals and snacks. This shift is also associated with reduced physical activity at work for adults and play for children. This could be as a result of advanced technologies that promote sedentary lifestyles which could ultimately result into rapid increase in the incidence of over-weight and obesity.

Prominent factors contributing to the above shift in diet are issues related to agricultural systems as well as agricultural technology and factors that affect the demand for and consumption of food. Such factors include economic resources, demographic patterns, and various cultural and knowledge factors associated with food choice, disease patterns, and sociologic considerations. Other factors are those that affect how we move, work at home and in the marketplace and changes in our leisure activity patterns, modernization, urbanization, economic development, and increased wealth which lead to predictable shifts in diet, referred to as "nutrition transitions (Harvard, 2018).

### Pattern of Nutrition Transition

Harvard, (2018) categorized nutrition transition into five patterns:

Pattern 1 Hunter Gatherer: Individuals live highly active lifestyles, hunting and foraging for food. Diets typically are rich in fibrous plants and high in protein from lean wild animals;

Pattern 2 Early Agriculture: Famine is common, slowing individuals growth and decreasing their body fat;

Pattern 3 End of Famine: Famine recedes as income rises and nutrition improves;

Pattern 4 Overeating, Obesity-Related Diseases: As income continues to rise, individuals have access to an abundance of high-calorie foods, and

they become less active, leading to increases in obesity and obesity-related chronic diseases, such as diabetes and heart disease;

**Pattern 5 Behavior Change:** In response to increasing rates of obesity and obesity-related chronic diseases, individuals change their behavior and communities promote behavior changes to prevent these conditions.

The current trend observed globally indicate that most low and middle-income countries are also rapidly moving from pattern 3 to pattern 4 as shown above. This shift from traditional diets to Western-style diets remain a significant contributor to the recently observed malnutrition epidemic and related diseases in low and middle-income countries.

### **Nutrition transition in infant feeding in Nigeria and its implications for child survival**

It has been established that diet and nutrition play dominant roles as determinants of disease conditions of both under- and over-nutrition. The former results in protein energy malnutrition (PEM) and micronutrient deficiencies (vitamin A deficiency diseases (VAD), iodine deficiency disorders (IDD), and anaemia), while the latter is responsible for diet-related non-communicable diseases such as cardiovascular diseases, obesity, hypertension, type II Diabetes Mellitus, osteoporosis (Oganah, 2014) and several other forms of metabolic disorders. Adequate nutrition in the early years of life is essential for children to develop to their full potential. This will ensure the healthy human resources the country needs for sustainable economic growth and overall healthy growth and development of a child (WHO, 2018). However, studies have shown that malnutrition and high level of poverty remain underlying cause and major barrier to development in Nigeria. Oganah, (2014) identified that the main nutritional problems identified include: Inadequate intake of energy and protein (PEM); Micronutrient deficiency; Poor infant feeding and caring practices; and Nutrition related non-communicable diseases.

### **Nutrition Transition and its Implications during Infancy and Childhood**

Diets in developing countries have been observed to be influenced by food supplies which has gone

through a state of rapid transition in recent times. The concept of transition has been described by Popkin (1993) who identified two closely related theories of change.

The first theory relates to demographic transition, described as a shift from a pattern of high fertility and high mortality to that of low fertility and low mortality (as observed in developed countries). The second epidemiologic transition, proposed by Omran (1971) describes a shift from a pattern of high incidence of infectious diseases with malnutrition, poverty and poor environmental sanitation, to that of high prevalence of chronic diseases associated with individual lifestyles.

### **Behaviour Change Communication for Mother: Proposed Strategy Towards Optimal Feeding Practices during childhood**

In order to provide solution to the above challenges and several misconceptions and ignorance associated with recent surge childhood nutrition, nutritional intervention package based on appropriate theory of behaviour change has been proposed as a critical strategy towards eradicating ignorance and various misconceptions related to feeding during childhood and for promotion of appropriate childhood feeding behaviors (WHO, 2019). The above assertion was supported by the report of a survey to assess the nutritional status of children 0-12 months old in Gombe State, Nigeria which concluded that mothers should be targeted for infant nutritional education in order to address the various forms of nutritional derangements detected among children in the region ( Danjin & Nasiba, 2015). Improving infants' nutrition especially after the first six months of life therefore requires effective and carefully planned nutrition education and counselling based on theory of change for mothers and caregivers (WHO, 2009). This essentially involves dissemination of appropriate information regarding food hygiene, frequency of feeding, types, quality and quantity of foods to mothers to encourage mothers as well as caregivers adopt an effective infants' feeding behavior which would improve the existing child feeding practices and ultimately guarantees optimal child's growth (Griffiths & Rosso, 2007). Similarly, Girard & Olude (2012) recommend a well-designed maternal nutrition education intervention that is grounded in appropriate

theories of behaviour change in order to improve the effectiveness of existing maternal nutrition education and counselling on infants feeding practices.

A proposed nutrition intervention strategy in form of maternal nutrition education is 'Behaviour based maternal nutrition education' while a model towards effective maternal nutrition education on childhood feeding which is expected to encourage mothers improve on feeding practices and nutritional status of their infants is the Social Cognitive theory.

### Social Cognitive Theory

Social Cognitive Theory (SCT) developed by Bandura, (1989) describes an inter-related, process in which personal factors, environmental factors and human behaviour exert influence upon each other. Social Cognitive Theory describes the influence of an individual, the actions of others and environmental factors on individual health behaviors thereby providing social support for individual through instilling expectations and self-efficacy. The theory also advocate use of observational learning and other reinforcements to achieve behavior change (Raingruber, 2010)..

### Application of Social Cognitive Theory to Behaviorally-based Maternal Nutrition Education

Social Cognitive Theory (SCT) as applied in this review focuses on behavior change through reciprocal determinism that incorporates interplay of person (infant mothers), environment and behavior (Bandura, 1989). Bauman, Sallis, Dzewaltowski, & Owen, (2002) advocate the role of mediating factors in the behavior change pathway between an intervention and outcome (Bauman, Sallis, Dzewaltowski, & Owen, 2002). The behavioral mediators (self-efficacy, goals setting and outcome expectancy) are a part of the personal component in SCT's reciprocal determinism.

The core concept of SCT is the importance of others in shaping people's behavior. The nutritional education protocol explores means of enhancing maternal self-efficacy such as mastery of making healthy infants food and peer group modeling of child feeding practices.

In this review, the targeted expected maternal behavioral change is related to improved nutritional status of infants may be influenced by self-efficacy include improvement in food hygiene, infants meal frequency and dietary diversity.

### Conclusion

An emerging concept of nutrition transition characterized by a shift from diet based on indigenous staple grains, grains and legumes and limited food items from animal origin, to more varied diets of processed foods, more foods of animal origin, more sugar, fat, and alcohol is associated with severe nutritional challenges in infancy and childhood. Since mothers are pivotal with respect to infant feeding practices and nutrition status, a proposed nutrition intervention strategy in form of maternal nutrition education is Behaviour Change Communication which is expected to encourage mothers improve feeding practices and nutritional status of their infants and children

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