

ARTICLE

Health and Nutrition Status of Rural Children

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Introduction

One of the major issues the world is facing today is malnutrition. This problem is especially acute as well as chronic in the developing countries, especially among children. World-wide it is estimated that one in six children are born underweight.¹ Zimbabwe is no exception.

In Zimbabwe, child malnutrition had declined from 1980 to 1984. The numbers of malnourished children stagnated until the early 1990s. In 1994, the number of underweight children rose from 11% in 1988 to 17% in 1994.² Children in rural areas are at greater risk of under nutrition which leads to under weight and wasting than those in urban environments. Child malnutrition levels in rural areas are also greater than in urban areas.

Malnutrition is directly and indirectly implicated in more than half of all children's deaths. Those children who manage to survive, thousands are left chronically vulnerable to a variety of diseases and their intellectual abilities crippled for the rest of their lives.^{3, 4} Such a situation places a huge economic burden on families and the country as a whole.

In Zimbabwe, during the early years of independence, the government launched a comprehensive program aimed at improving health and nutrition status of the people, especially that of mothers and children. Significant progress was made, in the areas of children's immunization, breast feeding, and child nutrition. However, the harsh economic conditions the country has experienced in the past several years, has reversed gains in health and nutrition status of the people, particularly mothers and children. Rural are bearing the brunt of these adverse conditions, particularly in accessing food and poverty.

A project on maternal and child health and nutrition status assessment began in 1985. Data being reported here is part of this larger study carried out in a rural community in Zimbabwe. The paper will address child health and nutrition status, the prevalence of malnutrition, how health is influenced, and the urgency needed in identifying effective ways of addressing this problem.

Review of Literature

Malnutrition among children is a silent emergency which very few people are taking

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any notice of.^{1,3,4,5} This is particularly true in the developing world. Little attention is paid to this scourge because most of the children afflicted appear normal. This is mainly because health personnel is focusing on the severe form of malnutrition in which there are frank signs of emaciation, blindness, and presence of illness, for example. Today, in Zimbabwe there has been a decline in the severe forms of child malnutrition.^{1,6} The most prevalent forms of malnutrition are not marasmus or kwashiorkor. They possess similar and potent level of devastating health status. In this type of under nutrition, there are no frank signs.

In moderate and mild malnutrition, the signs are hidden and difficult to assess. Children appear normal on the surface but when a combination of clinical and biochemical analysis is done, it becomes apparent that all is not well with the children. Current studies show that children with mild and moderate malnutrition more likely to be predisposed to disease and other nutrition related health problems.^{6,7}

It has always been implied that malnutrition occurs due to famines, wars, draught and other disasters. In reality, a very small percentage of malnutrition is due to the above problems. The majority of cases are due to inadequate food intake, consumption of low nutrient density foods and infectious diseases.

Regardless of the misconceptions, the dimensions of the malnutrition crisis are clear and the consequences are grave. Malnutrition means diminished intellectual capacity or death of children. This is too high a price to pay for something that is so preventable.

Consequences of not taking action are catastrophic. A child that is malnourished is at greater risk of dying from common diseases such as measles. Current research indicate a connection between pre-birth malnutrition and later development of chronic health problems such as heart diseases, Diabetes Mellitus and high blood pressure.⁸ Other research show a connection between health status during the first 3 years of life and intellectual development in later years.⁹ In those countries where malnutrition is a problem, certainly these are additional issues that must be addressed.

The most vulnerable groups to malnutrition are fetuses through 3 years of age, pre-pregnant, pregnant and lactating women. In children, those at greater risk are those with inadequate dietary and nutrient intake, unprotected from disease and receiving inadequate care.^{9,10}

Nutrition Status

At no other time in human life is one person so totally dependent on another as during pregnancy. At this time, pregnancy outcome is dependent on the woman's experience of the past, present and future. This interplay is firmly rooted in receiving adequate nutrition before, during and after pregnancy.

In the ovum phase of pregnancy (the first 2 weeks after conception), activities taking place are dependent on maternal nutrient stores already in her body. This is why pre-pregnancy nutritional status is key to acceptable pregnancy outcome (birth weight of the baby). During the second phase of pregnancy (embryonic stage), formation of various tissue and organ systems is taking place. This is a critical phase, because if nutrients are not provided sufficiently by the maternal organism, malformations may result. These

abnormalities are not reversed by supplying nutrients later on in pregnancy.¹¹ Therefore, it is very important that before and after a woman becomes pregnant she receives adequate nutrition and is in good health.

Research suggest that low weight gain in either the second and third trimester was associated with a significantly greater risk of intrauterine growth retardation. Consequently, increased awareness of maternal weight gain in mid to later pregnancy is critical to identifying infants at risk of intrauterine growth retardation.¹²

During intrauterine growth, protein is required for new tissues synthesis. Protein quality is also critical because, protein foods consumed must provide all the essential amino acids in the right amounts required by the body. New tissue synthesis requires a great deal of energy. Therefore, energy requirements should be above and beyond those needed for growth of the fetus. Besides meeting nutrient needs for the growth of the fetus, mother also must meet her own maintenance needs .^{10,13}

Vitamins and minerals also play a pivotal role in pregnancy. Vitamins, for example, the water-soluble group are important in energy metabolism and tissue synthesis. Research has shown that when vitamin A had been supplemented during lactation, the intervention was beneficial, however, it was not enough to correct the underlying sub clinical vitamin A deficiency in women nor having their infants into acceptable vitamin A status.¹⁴ These findings clearly point to fact that supplementation should have been started before lactation to make a difference in the vitamin A status of these mothers and their infants.

Iron is important for transporting oxygen through out the body. Women who have been found to be anemic have been reported to be more likely to give birth to low-birth weight, premature, or small-for-gestational age infants. Other minerals play important roles in bone and tooth formation and synthesis of hormones responsible for energy formation.¹⁵ To ensure that she meets these levels, it is very important that women be adequately nourished.

Women also must be protected from disease. According to research, children that are born to women who had malaria were found to be at greater risk of being born under weight and anemic.¹⁵ Therefore, it is critical that health and nutrition status of women and children be safeguarded.

During pregnancy, adequate weight gain is critical to birth weight of the baby. In addition, the foundation for efficient lactation is laid during pregnancy. It is critical that women receive adequate nourishment, before, during and after pregnancy in order to have an acceptable pregnancy outcome.¹⁶

At birth, a healthy baby is born with sufficient nutrient reserves, especially iron to last the first 6 months after birth. This process takes place during the second and third trimester. Most of the weight gain the fetus needs to reach before birth occurs during the second and third phases of pregnancy.¹⁰ So, it is imperative that the woman receives optimum nutrition.

After birth, the only type of food the infant requires for the first 4-6 months is breast milk. Breast milk provides significant benefits to the infant, for example, immunity is improved. During this period, it is extremely essential that mother receive proper

nourishment in order to continue to lactate efficiently.

When mother does not lactate efficiently, this leads to the introduction of solid foods at a much earlier age, which is detrimental to infant health. The gastrointestinal tract of an infant is not prepared to deal with other foods besides breast milk and formula until the baby is 4-6 months of age.^{10,16} Introduction of solid foods at less than 4 months of age may result in diarrhea for the child. Diarrhea will rob the child of the few nutrients it might have. Frequent and persistent of diarrhea predisposes the child to malnutrition. World-wide, it is estimated that 2.2 million children die from diarrhea that is often aggravated by or aggravates malnutrition.¹⁷

Children who are not well nourished have a higher risk of dying from common childhood disease than their well fed counterparts. These children are also more likely to experience stunted growth which has a deleterious effect on intellectual capacity.

World statistics show that about 12 million children under the age of 5 die each year. Fifty five percent of these children die from causes directly or indirectly linked to malnutrition.¹⁸ Clearly, the battle to protect children from malnutrition and diseases that are attributable to under nutrition must be mobilized effectively and without delay.

Methodology

The children assessed were from the women who were participating in the maternal health project. Four hundred and fifty children were assessed.

Infants ranged in age from 0 to 24 months of age. Women and children who were sick or ill were excluded from the survey.

Methods and Procedures

Collection of information was done utilizing questionnaires, dietary assessment, anthropometric measurements, clinical analysis, blood analysis, and environmental assessment .

Health assessment consisted of anthropometry, blood and clinical analysis. Anthropometry involved weight, height, recumbent length (infants), arm and head circumference. Weight was done using portable hanging balance, height was determined using recumbent height measuring unit. Weight measurements were done without sweaters, coats, and shoes on. Recumbent height was determined without shoes on. Arm circumference were done using tape measures. Analysis of anthropometric data was done using charts produced by Oxfam, UK.¹⁹

Blood analysis involved hemoglobin assessment. Blood drawing utilized the finger prick procedure using established guidelines. Hemoglobin was done using a HemoCue.²⁰ Results were recorded on the health assessment form which was developed using guidelines by Jelliffe and Jelliffe.²¹

Clinical analysis involved physical examinations and were carried out by a registered nurse. Results were recorded on health assessment forms. Clinical analysis consisted of taking blood pressure, and assessing of skin, eyes, hair, mouth, ears, neck, hands, and feet.

Data on dietary assessment was collected using food frequency, nutrient content

analysis, and diet history. Standard forms were developed using guidelines by Jelliffe and Jelliffe²¹ to record the information on frequency of consumption and diet history. Nutrient content analysis were done using the food composition tables for Zimbabwe.²²

Results

Four hundred and fifty children were surveyed in a 3 month period. Results show troubling patterns in child health, growth and development. Table 1 shows the factors that influence child health and nutrition status. Most children are fed almost like adults. Adults eat an average of 2 times a day. For the growing child, this is truly inadequate. Children's stomachs are far smaller than those of adults. So, they can not be expected to consume a large amount of food at one sitting. They need as many as 6-8 meals per day. The types of food fed children should have variety to enable them to meet all their essential nutrient requirements. The nutrient quality of food consumed by children must be of high quality. Foods such as meat, fish, eggs, milk, fruits and vegetables in the right form suitable for a child should be prepared. However, children under the age of 12 months should not be given cow's milk unless it has been altered and fish must be deboned. The food should be in a form that will be easy to chew for the child.

More families are finding it more difficulty to access food due to weather patterns and prevailing economic conditions. Women have little knowledge on the needs of children and their care. Poverty level of families is a huge contributing factor to the poor status of children.

Table 1: Factors Influencing Child Health and Nutrition Status

Frequency of feeding
Feeding styles
Types of food
Nutrient quality of food
Access to food by families
Lack of knowledge
Poverty

Besides breast milk, the types of foods children were fed included porridge in the morning and sadza with stewed vegetables for lunch and dinner. The major source of protein for such meals is corn or maize. Corn is limiting in essential amino acids Lysine and Tryptophan. Vegetables are a good source of vitamins and some minerals. However, the method of preparation - boiling destroys vitamins, especially the water-soluble ones. In addition, draining excess water from vegetables during preparation contributes to further loss of vitamins and minerals. At times, peanut butter, a good source of protein is added to vegetables. But amount (about 2 tablespoons per pot which contains 3 cups of cooked vegetables) is too little to make difference in protein intake of children.

Table 2. Food Frequency Consumption of Patterns of Selected Foods

Food Item	Daily	Weekly	Monthly	Occasionally	Never
Vegetables	76	18	0	4	1
Fruits	25	22	11	28	14
Meat	19	36	22	15	7
Fish	4	24	20	18	35
Poultry	2	35	45	11	7
Eggs	23	22	11	11	33
Milk	61	11	4	7	18
Beans	6	27	14	12	41
Peanuts	46	26	8	8	12

As shown in Table 2, data on food frequency consumption of selected foods indicate foods that are high in protein are consumed mainly on a weekly or monthly basis. The consumption of milk is high, however, most of the milk being reported here is added to tea which of course is a negligible amount. Some mothers reported giving tea to their one year old. This is not proper, because tea contains tannins, a chemical compound which inhibit the absorption of iron, zinc and calcium. Also peanuts are consumed more on daily basis because of the 2 tablespoons added to cooked vegetables. What is ultimately consumed by the child in very little and difficulty to measure.

According to calculations done using Oxfam charts, data on weight-for-age show 1% of the children to be in severe malnutrition range (60% of ideal body weight). It was not determined whether this was due to AIDS. Fourteen per cent of the children were within their ideal body weight (90%-100%). Twenty five per cent of the children were considered to be in the mild malnutrition range (they had 75-89% of ideal body weight). Sixty percent had moderate malnutrition (they had between 75-61% of ideal body weight). In addition, 80% of the children had hemoglobin levels of less than 12g/dl. Of this group, half were 10g/dl and less.

The prospects of economic life improving in the households that these children come from is bleak. Therefore, there must be a concerted effort to help families have a more reliable supply of food and favorable chances in their economic outlook.

Health history data showed 60% of the children to have had 2 or more bouts of diarrhea, 30% had eye infection, 29% had scabies, 21% had bowed legs and 7% had enlarged joints. Repeated occurrences of diarrhea predisposes children to malnutrition. It goes without saying that much research is needed to identify specific nutrient deficiencies in children. Clearly, however, families need to be made more aware of the consequences of such health problems and their prevention through education.

Discussion

There is a great deal of truth in the saying "you are what you eat". This is clearly

demonstrated in the growth and development of children. When food and nutrient intake by children is inadequate, there are clear signs which manifest in a variety of ways. Some signs are very clear while other are subtle or remain hidden and undetected by the naked eye. Under nutrition in some children may be unpronounced and most people think that the children are healthy.

Malnutrition presents itself in a variety of ways. In some cases it may be protein energy malnutrition, iron, iodine, vitamin A, or folate deficiency. How nutrients function in the body is like an orchestra. When one is not there in sufficient amounts required by the body, the optimum functioning of the body's systems is impaired. The nutrients that the body cannot produce and dependent for supply from the foods we eat, are especially vulnerable.

During early infancy, all the baby does is to eat and sleep. This is because the rate at which growth is taking place in the first year of life is very rapid. By the time the infant is 4 to 6 months of age, it must double its birth weight and triple it by the age of 12 months.¹⁷ This is the fastest rate of growth in the life cycle. To accomplish this massive rate of activity, the body needs a tremendous amount of nutrients and energy for efficient growth and development.

Nutrient deficiencies during such critical growth periods may lead to poor rate of growth. Under nutrition is a detriment to proper growth and development in children and growth is the best single indicator of the nutritional status of a child.

Organ systems such as the brain have their fastest growth during infancy. It has been reported that when energy needs are compromised during infancy, this keeps down the number of adipose cells and the result is severe retardation of some organ systems.²³

The quality of food fed to children also must be improved. Children undergo a tremendous rate of development in the first 5 years of life with the first year being the most dramatic. For such a rate of development to be sustained, quality and quantity of food given to children must be made a priority by all families. Creating awareness of the importance of such practices in caring for children is critical.

Iron deficient children under the age of 2 years of age showed more problems with coordination and balance. They also seemed to be more withdrawn and hesitant. Such a state will deter a child's ability to interact in the learning environment.^{1,24} Studies on intellectual ability assessment involving school children who were anemic or iron deficient showed that they had more absenteeism, reduced attention span therefore, had lower performance in school.²⁵

Iodine deficiency in utero was found to result in serious mental retardation. Milder forms of deficiency also were shown to be taking a toll on intellectual abilities of children²⁶.

Often times children suffer from multiple nutrient deficiencies. This exacerbates the deleterious effects of malnutrition and infection. Therefore, children suffering from protein energy malnutrition often overlap with other nutrient deficiencies, such as iron, or vitamin A deficiencies.

Stunting is very serious problem for children, especially for the female child. Women who experience growth stunting in childhood are more likely to have obstructed labor. Therefore, they are at greater risk of dying in child birth. Obstructed labor is one of the

leading causes of maternal mortality in developing countries. Twenty percent of women in Sub-Saharan Africa are underweight²⁷. Most women experience underweight from early childhood.

The patterns of feeding children and the types of foods children require must be part and parcel of every education program families receive. There is also need to improve access to food for many families in rural areas. Encouraging income generating activities which assist families to get money is a feasible strategy. Ways to help families access money that may be used to purchase food during those times when food production in the fields has been poor or minimal need to be explored vigorously.

Thousands of children are reported to be wasted. In Zimbabwe, 17% of children are said to be underweight.² This is a result of insufficient food and nutrient intake. Underweight children are 2 to 8 times more likely to die within the following year than well nourished children.

Zimbabwe has had comprehensive policies that were aimed at improving health and nutrition status of people in the rural areas. These resulted insignificant changes in accessing clean water, education, health care, immunization, and sanitation. Economic down turn of the early 1990s plus other factors have eroded almost all of the gains that were achieved in the first few years of independence. The has result has been an increase in child malnutrition in the past few years.

As a country, we have the capacity to reverse this trend in children's health and nutrition status. Zimbabwe has wealth in natural resources, a vibrant agricultural and industrial sector and highly educated population. Therefore, with all this we can work together to over come whatever is ailing the economy. However, there can be no delay in tackling the problems of health, nutrition, and protecting children from harm, because the cost to development, and the future of Zimbabwe is too great.

Conclusion

Children are a nation's most vital and important resource because it is they who are poised to take over from their parents to advance a country's future development. The well-being of children from pre-birth must usher in an uncompromising sense of responsibility to their welfare. A strong sense of out rage should prevail at all levels of state and society at the lack of protecting children from poverty, poor health and care.

It is unrealistic for any country to seriously address its future while it is blind to the plight of children. Therefore, it is imperative that the future of children be safe guarded by fully addressing their needs from pre-birth which is the very beginning of their lives.

Current research suggest that the most critical time in a child's development is between pre-birth through the first 3 years of life , especially where brain development is concerned. Brain development starts during pre-birth and continues through the first 3 years after birth. Any nutrient deficiency during such critical periods of growth may be marked by a reduction in brain cells, which impair intellectual capacity and compromise school performance.

Both genetics and environment play a decisive impact on the structure of the brain.

The experiences that a baby has from pre-birth to the time he/she is 3 years of age has been found to influence his/her adult capacities. Stimulation that children undergo during early childhood is a critical piece to how a child participates in his/her own development.

Well placed and timed intervention is essential, because if left unattended, intervention may later prove to be costly and may not result in positive growth outcome for children is very important.

Therefore, an all out and sustained effort in education programs aimed at creating awareness on the importance of child health and nutrition, the consequences of not maintaining healthy children, and putting all the necessary resources to improving the quality of life of children.

Notes

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