AJFAND ONLINE Scholarly, Peer Reviewed ISSN 1684 5374
Volume 12 No. 2
April 2012
African Journal of Food, Agriculture, Nutrition and Development
Published by African Scholarly Science Communications Trust

ASSESSING NUTRITION INTERVENTION PROGRAMMES THAT ADDRESSED MALNUTRITION AMONG YOUNG CHILDREN IN SOUTH AFRICA BETWEEN 1994-2010

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AJFAND ONLINE Scholarly, Peer Reviewed
ISSN 1684 5374
Volume 12 No. 2
April 2012
African Journal of Food, Agriculture, Nutrition and Development
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ABSTRACT

Several nutrition intervention programmes have been implemented to alleviate malnutrition among young children in South Africa. However, both nationwide studies and smaller, region-based reports show that many of these programmes have failed to improve nutritional health among the target groups. This is an overview of the most important nutrition intervention programmes implemented in post-apartheid South Africa. It is based on data sampled between 1994 and 2010, and collected from HighWire Press and MEDLINE data bases, local journals, official reports as well as experience gathered over the past two decades. Abstracts and nutrition issues related to chronic and communicable and non-communicable diseases were not included. The main aim of the implemented supplementation programmes after the Second World War was to correct states of undernutrition. However, these efforts did not benefit the disadvantaged groups, particularly the coloureds and the blacks. Following the downfall of the apartheid regime, various nutrition intervention programmes have been implemented with varying degrees of success. These include health facility-based programmes, community-based programmes as well as nutrition promotion strategies. The more holistic approach of the Integrated Nutrition Programme since 1994 is commendable, but programmes have failed to restore adequate growth rates among the impoverished children. Most likely, the failures are not as a result of inappropriate policies and strategies or lack of knowledge about relevant solutions, but rather inadequate implementation and scale of the programmes. In order to ensure a satisfactory improvement in nutritional health in South Africa, the various programmes should undergo regular evaluations to identify pitfalls and shortcomings. The fight against undernutrition and hunger, which are rooted in poverty and social inequalities, remains a major challenge for the South African health authorities. Urgent scale-up of the current nutrition intervention programmes as well as evaluation of their implementation are needed, coupled with strategies for education, skills development, job creation and poverty alleviation.

Key words: Children, nutrition, South Africa, supplementation

INTRODUCTION

Despite it being more than 15 years after the downfall of the apartheid regime, the nutrition situation of young South African children has not shown significant improvement. It is clear that there are still substantial social differences and inequalities in healthcare that continue to impact on childhood nutritional status in South Africa. In view of this, three nationwide surveys as well as smaller studies have demonstrated marked deficiencies in dietary intake of energy and micronutrients [1-5]. Moreover, the prevalence of stunting, reflecting chronic malnutrition and underweight are high, particularly within the previously disadvantaged groups, and many households still suffer from hunger and food insecurity.

In order to alleviate the increasing problems related to malnutrition and hunger, the authorities have launched a number of programmes since 1994 aimed at correcting poor nutritional status among young South African children. Here we give a condensed overview of the most important nutrition intervention programmes.

MATERIALS AND METHODS

High Wire Press and MEDLINE databases were searched for studies performed in the period January 1st 1994 to June 30th 2010. Local journals published in Southern African countries that are not listed in these international databases were also included. In addition, available official reports and papers pertaining to matters of nutritional health in this country were studied. Our experience working with various nutrition intervention programmes since 1994 was also included. Abstracts and nutrition issues related to chronic communicable and non-communicable diseases were excluded.

RESULTS

Nutritional programmes and interventions prior to 1994

The Union government of South Africa (previously a British colony) introduced food support programmes during the Second World War which channelled foods such as milk and butter to the malnourished. Free milk was also distributed in schools to white and some coloured primary schools from 1938 and continued for about two decades. Other interventions such as food subsidization, voluntary enrichment of maize meal and food aid followed. Although the underlying principles were economically sound, the practices were flawed, since Black Africans were excluded from the benefits of many of these schemes [6].

Nearly 40 years ago the Protein Energy Malnutrition (PEM) scheme was implemented. It was a targeted food supplementation programme as a way to combat malnutrition among children below 6 years and at risk pregnant and lactating women, and mainly operated through local clinics and health centres. The food provided included: skimmed milk powder, energy-enriched instant maize meal and breastmilk substitutes. Various challenges were experienced with the PEM scheme, including: shortage of appropriate staff to implement, monitor, and evaluate the scheme;

fragmentation of authorities involved at different levels of healthcare management; use of foods which were not generally consumed by communities; provision of a full range of breastmilk substitutes to mothers with underweight or growth faltering infants [6]. In 1991 the PEM scheme was extended to include food parcels containing products such as full cream milk powder, soy products and maize meal. This initiative was short-lived since various problems were experienced with the storage and increased workload brought about by this initiative [6]. During the 1970s and 1980s the focus was predominantly on nutrition education to combat emerging diseases of lifestyle in the increasingly affluent and westernised white population, although central government continued to provide a subsidy to some local authorities to alleviate malnutrition [6].

Nutritional programmes and interventions after 1994

Following the election of a new democratic government in 1994, a comprehensive national nutrition strategy for combating malnutrition was established following a recommendation from the Nutrition Committee appointed by the Minister of Health. In considering the multi-sectoral and complex causes of malnutrition, the committee recommended an Integrated Nutrition Strategy (INS) with three components, namely health facility-based, community-based and nutrition promotion. The INS was adopted in the Department of Health White Paper for the transformation of the health system and served as the basis for the development of the Integrated Nutrition Programme (INP). The INP adopted UNICEF's Conceptual Framework on malnutrition and targets nutritionally vulnerable communities and groups, including children below 5 years (Table 1).

Depending on the location of the target group and the nature of the intervention, the INP is implemented at the level of population, community sites, households, health facilities, and schools. In this way the Department of Health wanted to replace previously fragmented nutrition programmes with a more integrated approach, also supported by the fact that sound nutrition is considered a basic human right according to the South African Constitution (1996).

The Primary School Nutrition Programme (PSNP) was one of the Presidential Lead Projects that started in 1994. It was resorted to under the INP with the main aims to address short-term hunger and improve active learning capacity of children in the classroom. This programme was monitored and evaluated on an ongoing basis. An evaluation report of 2000 recommended that school feeding should continue, but that steps should be taken to improve the programme and that a high level policy decision should be taken on the future context, for example whether it should be a nutritional, educational or social relief intervention. The evaluation report of the Health Systems Trust found that the education, health and nutrition goals of the PSNP have not been realized and that coverage has been poor in many parts of the country [7]. There were, however, anecdotal accounts of improved school attendance and classroom performance as a result of school feeding. It was stated that many of the problems of the PSNP have been the result of inadequate management of the programme due to a lack of capacity, inefficient and inappropriate management systems, poor infrastructure in rural areas of the country and corruption. Consequently, a cabinet

decision was taken to transfer the programme from the INP to the Department of Education in 2004 and the name changed to the National School Nutrition Programme.

The PEM scheme was later incorporated into the Health Facility Based Nutrition Programme (HFBNP) of the INP and the name was changed to the Nutrition Supplementation Programme (NSP). This programme aims to correct undernutrition by providing nutrition supplements as well as nutrition education and counselling. In 2010 the name was again changed, this time to the Nutrition Therapeutic Programme (NTP), mainly to make it clear to health workers that it should not be seen as a food hand-out in support of a social welfare programme, but that it is a therapeutic measure to address undernutrition. The comprehensive HFBNP of the INP involves macro- and micronutrient supplementation, nutrition and health education, promotion of exclusive breastfeeding according to WHO guidelines, growth monitoring and promotion, immunization as well as diagnosis and treatment of diseases [8]. Evaluation of the impact of this nutrition supplementation scheme had been scarce, but various investigations and a study performed in the Northern province identified a number of problems regarding the scheme. These relate mostly to budgetary problems, poor compliance, lack of standardised staff training, inappropriate targeting, incorrect application, inadequate nutrition counselling and no standardised monitoring [8]. Despite huge efforts and funds allocated to execute this programme, the NTP is yet to undergo a full evaluation.

To further address the poor micronutrient status, the INP also focuses on the fortification of foods with specific micronutrients. Salt iodisation has been mandatory since 1995 and since 2003 it has been mandatory among manufacturers to fortify maize and wheat bread flour with iron, zinc, vitamin A, thiamine, riboflavin, niacin and vitamin B_6. The fortified staple foods reached the market in October 2004 [3]. One main aim of the third nationwide survey (NFCS-FB) commissioned in 2005 by the Department of Health, was to establish a baseline for examining the effects of fortification on nutritional status among young children [3]. Although the NFCS-FB found that food producers in general adhered to the fortification scheme, neither the anthropometric nor the micronutrient status had improved much and hunger still persisted, in particular among the disadvantaged in the rural communities. Some of the reasons for these disappointing results may include poor compliance, missed opportunities, incorrect implementation and instability of added micronutrients. Since 2009 the Vitamin A supplementation programme has been extended to include a national Vitamin A campaign in September of each year and a new policy on zinc supplementation has also been implemented since 2010.

Today, the INP includes a holistic approach to combat malnutrition. The 8 key performance areas of the INP (Table 2) reflect the commitment to target the most vulnerable groups as well as the most pressing nutritional problems in the country (Table 1). Two of the eight INP key performance areas, “Maternal nutrition” and “Infant and young child feeding”, include strategies to promote, protect and support safe infant feeding practices. South Africa has more than 232 Baby Friendly Facilities to date from a possible 545 facilities and is gaining momentum with attempts to

improve breastfeeding rates through the implementation of the Baby Friendly Hospital Initiative [6]. Proposed legislation of the South African Code of Marketing of breast milk substitutes is in draft format and it is envisaged that legislating this Code together with other strategies to promote, protect and support breastfeeding, will contribute to improved breastfeeding rates, and ultimately improved infant and child health in South Africa.

The South African Infant and Young Child Feeding policy (focusing on infants and children 0-60 months) was signed by the Minister of Health in February 2008. The purpose of this policy is to standardize and harmonize infant feeding messages, to guide healthcare providers on how to address threats and challenges to infant feeding, and to promote optimum infant feeding practices [9]. A national working group has developed preliminary South African Pediatric Food-Based Dietary Guidelines. These important nutrition messages have been consumer-tested and the supportive evidence published [9]. The extent of stunting in young South African children is a great concern [3]. Stunting in childhood is a risk factor for increased mortality, poor cognitive and motor development and other impairments in function. It usually persists into adulthood, leading to smaller size and poorer work performance. Stunting is particularly difficult to reverse after 36 months of age, therefore interventions in pregnancy and in young children, especially those under 24 months of age, should be the focus of interventions. The new Road to Health Booklet for children 0-60 months has been launched by the Department of Health and was rolled-out on February 1st, 2011. It incorporates the 2006 WHO growth standards and does not only focus on weight-for-age, as in the past, but also includes height-for-age and weight-for-height tables. This is a step in the right direction for addressing the above mentioned stunting problem in the country.

Administrators of the programmes - The primary health care clinics

The main executers of these activities are the primary health care clinics (PHC), usually localized adjacent to or within suburbs, townships and informal settlements. Presently there has been no systematic evaluation of how well these clinics perform in terms of nutritional services to their target groups and hence it is difficult to describe how well the various intervention programmes function. Given the apparent lack of improvement during the last decade in several growth indicators, one can assume that these clinics also face large challenges. A study by Schoeman *et al*. [10] in 2003 identified that problems in infrastructure, basic resources and services in the primary health care facilities in the rural districts of the Eastern Cape and KwaZulu-Natal provinces, adversely affected the service delivery and well-being of rural people. In two studies we evaluated aspects of the NTP in 20 clinics located in urban and rural areas of the Western Cape province of South Africa during 2008 [11,12]. Interestingly, whereas the staff in general felt they handled the nutrition supplementation programmes well and attributed most of the problems with implementation to the target groups (mothers of young children), the mothers themselves on the contrary complained about lack of knowledge and awareness about the supplementation programmes. Budgetary difficulties were also identified by the staff, thus corroborating the previous findings of Hendricks *et al.* [8]. Whether these findings can be extrapolated to the whole country remains to be examined.

CONCLUSIONS

The Lancet Series reported on interventions that affect maternal and child undernutrition and nutrition-related outcomes, including breastfeeding promotion, strategies to promote complementary feeding, with or without provision of food supplements, micronutrient interventions, general supportive strategies to improve family and community nutrition, and reduction of disease burden [13]. Effective interventions for infants and young children included promotion of breastfeeding, education on complimentary feeding (with additional food supplements in food insecure populations), supplementation with various micronutrients (including zinc, vitamin A and iodine), treatment of severe malnutrition and hygienic practices [13]. In response to the Lancet Series, the WHO developed the Landscape Analysis (LA), which is a readiness analysis for countries to improve nutrition. The ultimate aim is to lay the foundation to implement consolidated and harmonized action at scale in the 36 high burden countries, which include South Africa.

Despite some commendable successes of the INP in South Africa and implementation of many of the recommended nutrition interventions in several other developing countries, programmes have failed to restore adequate growth rates among impoverished children [14]. Failures experienced are most likely not the result of inappropriate policies and strategies or lack of knowledge about relevant solutions, but rather inadequate implementation and scale of the programmes.

Some of the factors believed to contribute to ineffective implementation of programmes globally have recently been summarized by Morris *et al*. [15] and include weak coordination, lack of high level interest, inadequate human resources and capacity, inadequate funding, inadequate strategies, limited sticking power of policies, and structures that impede collaboration [15]. Also of note is the unresolved question of what type of food is best suited for the supplementation programmes, in particular regarding use of plant or animal sources. There are claims that animal-based proteins are superior in this aspect, however they are usually also more expensive [16].

Although some progress has been made in South Africa in policy development, the implementation of some of these policies and guidelines remain problematic. Healthcare workers are the crucial link between practice and policy and when policies fail it appears to be directly linked to the constraints in human resources. The NFCS-FB pointed out that the need for human resources for the successful implementation of the INP was clearly identified and flagged for urgent attention in a report of the Nutrition Committee to the Minister of Health [3]. The authors concluded that insufficient progress has been made in this regard and recommended that a national audit of nutrition personnel in the country should be undertaken. They also highlighted the need for the formalization and implementation of a human resource strategy for nutrition in the public health sector.

The paradox of over- and undernutrition, also referred to as the "double burden of disease", that is present in South Africa requires complementary strategies and an integrated approach to ensure optimal nutrition for all South Africans. In 2009 a LA was undertaken to identify bottlenecks in the development of responsive solutions and opportunities to scale up good practices. The LA revealed that South Africa has the potential and resources to scale-up key nutrition interventions to reduce maternal and child undernutrition. Although there is political commitment in improving the nutrition situation in South Africa, many challenges still remain, primarily as not all the commitments have been translated into concrete actions to improve the nutritional well-being of all South Africans [17].

An improvement of the prevailing socioeconomic conditions as well as proper implementation of adequately resourced intervention programmes and policies, are crucial in securing sustained improvement in the general health among the vulnerable groups in all of South Africa, including nutrition-related health of infants and young children.

ACKNOWLEDGMENT

The work was supported by the Throne Holst Foundation.

AJFAND ONLINE Scholarly, Peer Reviewed ISSN 1684 5374
Volume 12 No. 2
April 2012
African Journal of Food, Agriculture, Nutrition and Development
Published by African Scholarly Science Communications Trust

Table 1: Selected focus areas and targets of the Integrated Nutrition Programme (INP)*

FOCUS AREA Disease-specific nutrition support, treatment and counseling				
Strategic objective	**Indicator**	**2007 Target**[1]	**Baseline Status**[1]	**More Recent Status**
To contribute to the reduction in the prevalence of low birth weight	Proportion of live born infants born at health facilities with a birth weight of < 2 500 gram	National target not available	1992: 10.7%	8% : SADHS 2003[1] 9% : DHIS 2006[2] 16% : PPIP 2006[2]
To contribute to the reduction of malnutrition in children under 5 years of age, specifically of: • Underweight • Severe underweight • Stunting • Wasting	Proportion of underweight children <5 years of age	8%	Children 6 -59 months: 9.3%: SAVACG 1995	10% (1-9 years): NFCS1999[3] 12% (<5 years): SADHS 2003[4] 9% (1-9 years): NFCS-FB 2005[5]
	Proportion of severely underweight children <5 years of age	1%	Children 6 -59 months: 1.4% SAVACG 1995	1.4% (1-9 years): NFCS 1999[3]
	Proportion of stunted children <5 years of age	18%	Children 6 -59 months: 22.9%: SAVACG 1995	22% (1-9 years): NFCS 1999[3] 27% (<5 years): SADHS 2003[4] 18% (1-9 years): NFCS-FB 2005[5]
	Proportion of wasted children <5 years of age	2%	Children 6 -59 months: 2.6% :SAVACG 1995	4% (1-9 years): NFCS 1999[3] 5% (<5 years): SADHS 2003[4] 4% (1-9 years): NFCS-FB 2005[5]

To contribute to the reduction of morbidity and mortality associated with nutrition-related diseases of lifestyle	Proportion of overweight children 1 to 9 years of age	4%	No data	6% (1-9 years): NFCS 1999[3] 10% overweight (1-9 years): NFCS-FB 2005[5] 4% obesity (1-9 years): NFCS-FB-I 2005[5] Using WHO reference standards for children 1-5 years[6]: 20.5% overweight 9.5% obese
Reduction in the under-five mortality rate.	Number of children dying per 1 000 live births	30% reduction	50/1 000 live births; 1994	59/1 000 live births, SADHS 1998[4] 73/1 000 live births[7] 58/1 000 live births, SADHS 2003[4] 67/1 000 live births[7]

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FOCUS AREA

Prevention, reduction and control of micronutrient malnutrition deficiencies

Strategic objective	Indicator	Target[1]	Baseline[1]	More Recent Status
Elimination of micronutrient deficiencies among the population, focusing on vitamin A, iodine and iron deficiencies.	Vitamin A deficiency rate (serum retinol <20 ug/dl)	19%	33%: SAVACG 1995	65% (1-5 years): 2005[2] 66% (1-9 years): NFCS-FB 2005[2]
	Vitamin A supplementation coverage of children 6 – 11 months	95%		95% (1-5 years): DHIS 2006[2]
	Vitamin A supplementation coverage of children 1 – 5 years	80%		21% (1-5 years): NFCS-FB 2005[2]
	Iron deficiency rate of children <5 years	7.5%	10%: SAVACG 1995	11% (1-5 years): 2005[2] 6% (1-9 years)[8]
	Iodine deficiency rate of primary school learners	5%	No data	0.7% (1-9 years): NFCS-FB 2005[2] [50% of children nationally had a urinary iodine concentration in the excessive category]
To decrease the proportion of children with an intake less than the recommended levels of vitamins and minerals.	Proportion of children >6 months and <9 years *with an intake of* <50% of the recommended levels of the vitamins and minerals	40%	No data	< 50% (1-9 years): NFCS 1999[3]
To contribute to increasing the proportion of households consuming adequately iodised salt.		80%	No data	62%: NIS 1998[9] 97%: NFCS-FB 2005[5]

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FOCUS AREA

Infant and Young Child Feeding

Strategic objective	Indicator	Target[1]	Baseline[1]	More Recent Status
To increase the proportion of mothers who breastfeed their babies exclusively for six months	Exclusive breast-feeding rate	0-3 months: 12% 4-6 months: 2.5% 0-6 months: 10%	12%: SAVACG 1995	10%: SADHS 1998[2] 12%: SADHS 2003[2] 1%: SADHS 1998[2] 2%: SADHS 2003[2] 7%: SADHS 1998[2] 8%: SADHS 2003[2]
To increase the proportion of mothers who continue to breastfeed their babies with appropriate complementary foods up to 24 months of age and beyond	Breastfeeding rate	12 months: 70% 24 months To be set when data become available	12 months: 33%: SAVACG 1995 24 months: No data	68%: SADHS 1998[1] 24 months: No data
To ensure that mothers of infants under 24 months who are not breastfeeding, practice appropriate replacement feeding options	Proportion of mothers of infants under 24 months who are not breastfeeding who practice appropriate replacement feeding options	To be set when data become available	No data	No data

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SUPPORT SYSTEM Efficient and effective nutrition information system for planning, policy formulation and management				
Strategic objective	**Indicator**	**Target**[1]	**Baseline**[1]	**More Recent Status**[1]
To assess the nutritional status of the population through regular surveys	Number of surveys completed out of number of planned surveys	Target to be finalised	1994: 1	NFCS 1999[3] NFCS-FB 2005 (full report not yet released)[5]
To continuously collect, analyse and utilise data on specific nutrition indicators to monitor the nutritional status of the population	Number of nutrition indicators in DHIS	7/7	Nil	No data
To implement a minimum data set to manage information for programme development, implementation, monitoring and evaluation	Number of provinces submitting reports Number of national evaluations conducted	Reports: 9/9 Evaluations: To be finalised	Reports: No data Evaluations: Nil	4/9 Reports: 2000 8 Evaluations

AJFAND ONLINE Scholarly, Peer Reviewed ISSN 1684 5374
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SUPPORT SYSTEM

Effective and efficient management and development of human resources for the INP

Strategic objective	Indicator	Target[1]	Baseline[1]	More Recent Status[1]
To develop and implement the INP human resource plan	Proportion of posts filled	100%	No data	2000: 83% National 74% Provincial 2002: 100% National 61% Provincial
	Proportion of new staff that completed the induction course	100%	No data	Only instituted in 2003
	Proportion of staff that received in-service training	70%	No data	No data

SUPPORT SYSTEM				
Efficient and effective financial management and administration in support of nutrition goals and objectives				
Strategic objective	**Indicator**	**Target**[1]	**Baseline**[1]	**More Recent Status**[1]
To adhere to the requirements of the Financial Management Act and the Distribution of Revenue Act	Level of application of best practices	National: 100% good practices at national level Provincial: Good practices in most provinces	No data	2000: 100% National
	Proportion of funds spend (INP Conditional Grant Allocation)	100%	1998/99: 54% 1999/2000: 67%	2000/01: 87% 2001/02: 82%
	Proportion of funds spend (Special Allocation for Poverty Relief)	80%	1997/98 - 1999/00: Average expenditure 43%	2000/01: 17% 2001/02: 33%

*Adapted from various sources:

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Abbreviations:
DHIS: District Health Information System; PPIP: Perinatal Problem Identification Programme; SAVACG: South African Vitamin A Consultative Group 1994; INP: Integrated Nutrition Programme; HSR: Health Sciences Review 2008; NFCS: National Food Consumption Survey 1999; SADHS: South Africa Demographic and Health Survey 2003; NFCS-FB: National Food Consumption Survey Fortification Baseline 2005; NIS: National Iodine Survey 1998.

Table 2: The key performance areas of the Integrated Nutrition Programme

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- Maternal nutrition
- Infant and young child feeding
- Youth and adolescent nutrition
- Micronutrient malnutrition control
- Disease specific nutrition support, treatment and counselling
- Community based nutrition interventions
- Nutrition education, promotion and advocacy
- Food service management

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