

Nutrition training to prevent vitamin A deficiency: Nepal

ABSTRACT

Vitamin A deficiency and its consequences – including xerophthalmia nutritional blindness, poor growth, decreased immunity and increased severity of infections and mortality – is a critical problem of malnutrition and a major public health concern in the developing world. Children are particularly vulnerable: the World Health Organization (WHO) has estimated that severe vitamin A deficiency threatens 13 million children around the world with irreversible eye damage. Yet vitamin A deficiency and its effects – caused principally by insufficient diversity in the diet – is preventable. Positive results have been documented in some developing countries.

In Nepal, an estimated 500 000 people out of a population of 20 million are at risk of total or partial blindness due to vitamin A deficiencies, with millions more affected by less severe forms of the disorder. Over the last decade, the government has been committed to raising levels of awareness in health and nutritional improvement among rural people and has implemented public health-related measures to tackle problems of vitamin A deficiency in the short and the long term. Short-term measures have involved curative activities such as distribution of megadose vitamin A capsules, measles vaccinations and oral rehydration therapy to treat diarrheal episodes in children. Long-term measures have focused on educational and agricultural interventions to enhance production, distribution and consumption of carotene-rich vegetables and fruits. These activities have combined efforts and expertise of relevant government ministries and Tribhuvan University.

One of the most notable long-term initiatives has been a joint project of the Government of Nepal and the Food and Agriculture Organization of the United Nations (FAO), supported by the Government of the Netherlands: Multisectoral Training in Nutrition for the Prevention of Vitamin A Deficiency. This initiative successfully integrated nutrition/vitamin A concepts into existing training curricula in the agricultural, educational, health and local development sectors of

⁴⁹ Inflammation of the conjunctiva of the eye with abnormal dryness and corrugation.

the country. The 1991-94 training project aimed to achieve the long-term objective of improving nutrition by increasing production and consumption of carotene-rich foods and increasing the overall economic status of the population, ultimately ending distribution of prophylactic vitamin A capsules.

Innovative features of the project included:

- systematic development of needs-based curricula and training materials for nutrition education;
- participation of four ministries – agriculture, education, health and local development – in using the material and training their field staff at different levels;
- introduction of practical nutrition concepts into the government's adult education programme.

One of the key features of this innovative experience was an institutional arrangement facilitating coordination between sectors at policy, programme and operational levels. Ministry experts and trainers were involved from policy formulation to implementation of project activities. At policy level were the National Nutrition Coordination Committee (NNCC), made up of high-level personnel responsible for policy issues in the implementing ministries, and the university. At programme level was an expert committee, including at least one member from each sector, two nutrition experts and one senior member of the university, which provided expert guidance to project operating committees. Curricula and teaching materials were developed in workshops attended by all members of the expert committee, representatives of different ministries and nutrition experts. During implementation, experts from one ministry or one sector helped other ministries or sectors, and vice versa.

As a result, several sets of curricula on nutrition, with emphasis on vitamin A, were designed, developed and field tested for personnel of the four different ministries and two faculties (humanities and education) of Tribhuvan University working at programme and field levels. Prototype teaching materials and audio-visual materials were developed and training of trainers and target groups was carried out. Coverage of training activities was wide: some 2 400 trainers from various sectors were trained and 60 adult literacy centres were supported, including training for 800 women neo-literates.

The training programmes had a positive impact on developing the knowledge, attitudes and practices of the trainees. The courses and materials developed by the project were – and continue to be – a regular feature of training programmes. The project has proved effective in motivating important institutes to inform and mobilize national experts, administrators and other personnel to design and implement nutrition and vitamin A awareness materials at national level, with an

emphasis on vulnerable groups, including women and children.

This innovative experience in multi-sector nutrition training represents a positive step in creating nutritional awareness among urban and rural communities to improve dietary and health practices for present and future generations. Rather than develop a separate or complementary training programme, the Nepalese project integrated nutritional training into existing sector training programmes. This process was enhanced by an exemplary coordinating mechanism involving all sectors, which could serve as a model for other developing countries tackling nutrition and micronutrient deficiency.

INTRODUCTION

Nepal has decreased mortality rates and increased life expectancy among its population through expansion of various health care services and improved control of epidemic diseases. The country still has exceedingly high rates of infant, child and women's mortality and a high incidence of diseases or morbidity related to protein, energy, malnutrition and nutrient deficiencies, including iron, iodine and vitamin A. Nationwide surveys in Nepal have revealed that vitamin A deficiency is a serious public health problem which leads to xerophthalmia and blindness. It is estimated that because of the inadequate intake of vitamin A in the diet, half a million people run a high risk of becoming totally or partially blind. It is also estimated that over 50 percent of the children in Nepal suffer from chronic undernutrition⁵⁰ and over 6 percent suffer from acute protein-energy malnutrition.

A large proportion of the population, especially children and women, are deprived of modern health services. The Government of Nepal, committed to health for all by the year 2000, has implemented health service-related activities to overcome problems of malnutrition and vitamin A deficiency, with the assistance of various donor agencies.

The strategy used to implement this policy has been to coordinate the work of relevant government ministries and faculties of Tribhuvan University. These sectors are the key bodies with responsibility for improving nutritional status in the country. They have nationwide outreach programmes and thus reach both rural and urban communities. In the past, the strategy was to focus on both short- and long-term measures. Currently, no plan is envisaged for the fortification of foods with vitamin A because of the socio-economic condition of the country.

⁵⁰ Chronic undernutrition: condition in which the annual energy intake falls below the levels required to grow, maintain body weight and support light activity.

⁵¹ Malnutrition: poor physical condition resulting from inadequate dietary intake of energy and/or nutrients or from their biological utilization.

There is no appropriate and widely acceptable food available in the country that could act as a carrier for vitamin A fortification.

Short-term measures to control vitamin A deficiency are primarily health-based interventions, including dietary supplementation with megadose vitamin A capsules, measles vaccinations and oral rehydration to treat diarrhoeal episodes in children. Long-term measures have focused on agricultural and educational interventions that would prevent the occurrence of vitamin A deficiency and its consequences. Agricultural interventions aim to enhance production, distribution and consumption of carotene-rich fruit, vegetables and foods from animal sources, such as milk. The groups most affected by vitamin A deficiency are the lower socio-economic groups in both urban and rural areas with poor, monotonous diets. These groups need to be informed and educated about the links between appropriate diets and good health and the importance of and opportunities for using food-based strategies to prevent vitamin A deficiency.

Sustainable improvements in the vitamin A status of affected populations will result from the effects of measures that increase year-round availability of vitamin A and carotene-rich foods, improve the overall economic status of the population and provide appropriate nutrition education and dietary guidance. In view of the seriousness of the problem, comprehensive programmes incorporating short- and long-term measures will be necessary to achieve the goal of eliminating vitamin A deficiency. High-risk areas are those where supply of vitamin A and carotene-rich foods is insufficient to meet requirements and the population's knowledge and attitude about their use in the daily diet are inadequate. In such areas, administration of supplementary vitamin A capsules to school children and others will need to continue while comprehensive and lasting solutions involving agriculture and education are being realised.

To address the causes of malnutrition and vitamin A deficiency in Nepal, the government brought together the ministries of agriculture, education, health and local development and requested technical assistance from FAO and the World Health Organization (WHO). Its aim was to develop national strategies for controlling vitamin A deficiency problems within the United Nations Ten-Year Action Programme to Control and Prevent Vitamin A Deficiency, Xerophthalmia and Nutritional Blindness.

A workshop was held in 1986, with financial and technical support from FAO, **that led to** several important recommendations and the development of several project proposals. One of these, Development of Curriculum on Nutrition with Special Emphasis on Vitamin-A Deficiency Control in Formal and Non-Formal Training Sectors (TCP/NEP/8851; December 1987 - April 1989), was implemented with assistance from FAO's Technical Cooperation Programme. The pro-

ject developed sets of curricula and prototype teaching materials designed, developed and field tested for four ministries and two university departments.

The curricula were developed so that they could be implemented as an integral part of existing curricula of ministry training programmes. The ministries and the university have training infrastructures all over the country. As curricula and materials were developed for introducing nutrition concepts in the training and teaching programmes of the four ministries and the university, the need to train teachers and develop additional training materials was keenly felt. The training project Multisectoral Training in Nutrition for the Prevention of Vitamin A Deficiency (GCP/NEP/046/NET) was conceived to meet these needs and continue nutrition-related activities initiated under the TCP/NEP/885 1 project.

The NNCC, under the National Planning Commission (NPC), gave high priority to implementation of these curricula. There was confidence that through existing government training and education, many of Nepal's people would learn how to prevent malnutrition and vitamin A deficiency and reduce the risk of nutritional blindness and death by preventing diseases such as measles, diarrhoea and dysentery in their children. Teaching appropriate nutrition subjects at primary, secondary and tertiary levels of general education would be basis for changes in health practices, food habits and nutrition for future generations. In the case of adult neo-literates, integration of food and nutrition topics and messages in the Ministry of Education's adult education programme would contribute towards better dietary practices and complement knowledge about nutrition that their children would learn in primary schools.

Project focus

The objective of the project was to contribute, through teaching and training, towards improving nutrition, preventing vitamin A deficiency and reducing morbidity and child mortality in Nepal.

The specific objectives were to:

- strengthen the teaching capabilities of trainers of field extension agents at the ministries of agriculture, education, health and local development and tertiary education in nutrition and prevention of vitamin A deficiency;
- provide field extension agents from the four ministries with the knowledge and skills to contribute to improving nutrition and preventing vitamin A deficiency in their communities;
- support development of teaching materials for the training of trainers and field extension agents;
- upgrade teaching facilities at training centres.

PRE-INNOVATION

Vitamin A deficiency, along with several other nutritional disorders, has been a long-standing, major public health problem in Nepal. Deficiency causes xerophthalmia and nutritional blindness and also increases the risk of morbidity and mortality.

Two studies conducted during the early 1980s – the Nepal Xerophthalmia Survey of Children (1981) and the Nepal Blindness Survey (1981) – showed that incidence of vitamin A deficiency in the country was much higher than the criteria set by WHO, with the highest occurrence in the Terai. Risk factors for children with xerophthalmia included diarrhoea, infection, poverty and having parents with little or no education. A 1989 survey revealed that rates of Bitot's spot vitamin A deficiency remained almost the same in the intervening years.

The Government of Nepal has set a goal for the year 2000 to control and prevent vitamin A deficiency, reducing it to a level that will no longer constitute a significant public health problem. In doing so, it considered two sets of goals for nutrition improvement:

- the Basic Minimum Needs Goals, also known as the Goals for Poverty Alleviation, announced in 1987;
- the United Nations Convention on the Rights of the Child, ratified by Nepal in 1990, which contains sets of objectives by percentage and by year related to different stages of the life of a child and its mother.

The goal set for the year 2000 focuses on the virtual elimination of vitamin A deficiency.

In order to achieve these objectives, Nepal formulated strategies with multiple approaches. Short- and long-term measures were considered that coordinated the four ministries mentioned earlier and Tribhuvan University.

The short-term, health-oriented curative action included distribution of mega-dose vitamin A capsules, measles vaccinations and oral rehydration to treat diarrhoea episodes in children. Distribution of the vitamin A capsules was expected to be short-lived, because it was difficult and expensive. The long-term measures considered before project implementation were agricultural and educational interventions to prevent the occurrence of vitamin A deficiency and consequent xerophthalmia, nutritional blindness and physiological consequences such as the risk of increased morbidity and mortality.

In 1986, a national strategy and programming workshop was convened and a project proposal on training and education developed. The proposal aimed to pro-

⁵² Belt of plains in southern part of Nepal.

⁵³ Bitot's spot: desquamation (small bubbles) on the conjunctiva caused by vitamin A deficiency.

vide the basis for a long-term measure contributing to control and prevention of vitamin A deficiency through education and training and by revising curricula for formal and non-formal education of some ministries and the university.

The review and revision were carried out under project TCP/NEP/8851 between December 1987 and April 1989. As an outcome, 19 curricula on nutrition-vitamin A issues were developed for personnel working at different levels, from management to field level, at the four ministries and at the education and humanities faculties of Tribhuvan University. Eighteen sets of prototype teaching materials and some audio-visual materials were developed.

Development of curricula and teaching materials was achieved by involving experts from different sectors. Finalization of these documents resulted from discussions and plenary sessions in workshops. Before finalization, the curricula were field tested in the actual training situation of the ministries and campuses of Tribhuvan University.

The Technical Cooperation project completed the preliminary task of developing curricula and prototype teaching materials, thus recommending a project that would contribute through teaching and training towards improving nutrition, preventing vitamin A deficiency and reducing morbidity and early mortality.

INTRODUCING INNOVATION

Project strategy was geared towards developing sustainability, so that training activities would continue after its completion date. The project worked in collaboration with ministries and Tribhuvan University for the planning and execution of activities and aimed to strengthen technical capabilities by developing curricula, producing teaching materials and providing training for different levels of trainers.

After development of curricula and teaching materials, the project monitored their use in regular training programmes, during which expert consultancy services were provided. Some of the implementing sectors were provided with audio-visual equipment.

The project aimed to mobilize the training systems of all the sectors involved, integrate concepts of food, nutrition and vitamin A into curricula and ultimately take them to vulnerable people in rural areas, especially children and women. The topic of food and nutrition was integrated into the national training programmes of the Agriculture Training Centre, health training centres, primary and secondary schools, the Local Development Training Centre and Tribhuvan University campuses throughout the country. Through this strategy, revised curricula and teaching materials were developed by technical training subgroups of each ministry to become part of the training programme. Rather than develop a

separate or complementary training programme, the project aimed to incorporate nutritional training elements within existing training.

The project adopted an institutional arrangement that provided a sound basis for implementation of project activities. A harmonious collaborative approach among the implementing sectors made project implementation more effective. The National Nutrition Coordination Committee at the government's National Planning Commission was the principal policy-making body, providing guidelines for the project's expert committees, which then guided the operating committees in the six implementing units. Because of frequent changes in the government, however, some officials in the implementing units were transferred from one section to the other and new staff took over, which created problems. Through intensive training in the systematic curriculum development approach, material development processes and monitoring and evaluation techniques, the project was able to overcome the sudden transfer of personnel by involving and orientating the replacements, sometimes with other members of the expert committee or with the project director himself. The project was thus able to achieve far more than had been anticipated in the original document.

The experts and trainers from the ministries and university were involved from policy formulation up to termination of the project. The idea behind the involvement of experts and trainers from the inception of the project was to make them familiar with the concepts of nutrition and vitamin A and with the integration techniques to be incorporated into their training programmes.

The six operating committees served as core units for assuming responsibility for implementing project activities and identifying tasks to be carried out. Each sector was represented by a coordinator, who helped to develop training curricula and materials and implement training programmes. As the coordinators were usually members of the expert committee, they found themselves in a position to direct the training programmes and keep them to schedule. The project's emphasis on integrating nutrition education and vitamin A concepts within existing training programmes ensured appropriate planning, implementation and follow-up.

Since senior officials were involved in designing the project, their commitment and interest were reflected in the planning and implementation of their training programmes. The project thus made a considerable contribution to the creation of an infrastructure that enabled the programme to work efficiently and swiftly and ensure sustainability after the end of the project.

The project also strengthened the capacity of key personnel in different sectors by organizing study tours to examine similar programmes in neighbouring countries.

POST-INNOVATION

The project targeted the following units in the ministries for its services:

- the Nutrition Programme Unit of the Ministry of Agriculture;
- the Women's Development Division of the Ministry of Local Development;
- the Nutrition Unit of the Ministry of Health.

The task of introducing nutrition/vitamin A concepts into programmes to achieve project objectives was assigned to:

- the Adult Education Section and the Curriculum Development Centre of the Ministry of Education;
- the Health and Physical Education Department of the Faculty of Education;
- the Central Department of Home Science and Women's Development in the Faculty of Humanities and Social Sciences at Tribhuvan University.

The Curriculum Development Centre of Tribhuvan University was included in the project to coordinate curriculum and teaching materials development and implementation in the university departments.

In line with the objectives set out in the government's plans to raise awareness of health and nutritional improvement among rural people, especially women and school-leavers, the project made a wise choice in selecting sectors of government ministries with the greatest potential to disseminate information to the rural masses and have a multiplier effect.

The project's Evaluation Study Report showed that there had been achievements after implementation of project activities.

- Training personnel, including trainers, in sectors involved in the project, developing improved curricula and prototype teaching materials and using audio-visual aids had ensured continuity of the initiative.
- Provision of training programmes for different levels had strengthened the workforce situation in all sectors, Government changes during the project had resulted in frequent transfers of administrators and coordinators, which caused problems. Implementation of the project over three years disseminated substantial knowledge and expertise to numerous personnel in each sector. Some sectors were provided with audiovisual teaching and laboratory equipment, which helped run the programme more effectively.
- Courses and teaching materials developed by the project have continued to be a feature of **normal** training programmes.
- Efforts were made to incorporate nutrition and vitamin **A** concepts and issues into higher education. The health and physical education course in the Faculty of Education included nutrition and vitamin **A** issues. In the Ministry of Agriculture, three agricultural training centres running the nutri-

tion and vitamin A training programme for junior agricultural technicians, assistant junior technicians, agricultural assistants and agricultural officers strengthened the capability of the ministry, which reached all 75 districts of the country.

- In the Ministry of Local Development, the Women's Development Division and the Women's Training Centre conducted training programmes for women development officers and leaders of women's groups in villages. The WDD covered 64 out of 75 districts and was optimistic about covering a wider area in future.
- In the Ministry of Health, training programmes were conducted for community health volunteers and paramedics working at health posts with the aid of curricula and teaching materials developed in the project. There is a need for more training programmes to enhance integration of nutrition and vitamin A components into programmes.
- In the Ministry of Education, the adult education sector was able to train trainers from five Literacy Campaigns districts. Literacy centres were funded to run training on nutrition and vitamin A issues for neo-literates. Primary and secondary school teachers from Narayani zone, which has the highest prevalence of vitamin A deficiency, and from some districts covered by the Basic Primary Education Programme were trained.

Summary of training programme achievements

- In the agriculture sector, 355 trainers from 75 districts were trained.
- In two faculties of Tribhuvan University, 241 university teachers were trained.
- Trainers from 64 Women's Development 55 districts were trained.
- In the health sector, 118 trainers were trained.
- In the adult education sector, 1 280 trainers from five Literacy Campaign districts were trained and activities of 60 adult literacy centres were funded, including training 800 women neo-literates.
- In the school sector, 100 primary and 100 secondary school teachers from three districts of the Narayani zone and 40 primary school teachers from 20 districts of the Basic Primary Education Programme were trained.
- Training far exceeded the goals set in the project document.

In the light of these results, the project can be considered very effective. It motivated important institutes to mobilize national experts, administrators and

⁵⁴ Official term used by the Ministry of Education.

⁵⁵ Official term used by the Ministry of Local Development for the 64 districts in which women's development programmes are ongoing.

others to address the nutrition and vitamin A deficiency problem. Political commitment thus became part of the design, development and implementation of programmes at national level, with emphasis on the most vulnerable groups, especially children and women.

The Evaluative Study Report confirmed the positive result of production and use of curricula and teaching materials designed for various sectors in disseminating knowledge and expertise to numerous personnel at different levels. Training programmes were successful in raising levels of knowledge, creating favourable attitudes and making positive behavioural changes in school children, adult learners and community people.

The report noted that training was limited to some extent: there was a lack of practical activities at community level linked to the concepts discussed in the training programmes and insufficient contact with non-governmental organizations.

LESSONS LEARNED

Close coordination was important among the ministries and Tribhuvan University in carrying out curricula and teaching material development and running training programmes. The organization set up for implementing project activities was three-tiered.

- At the top was the NNCC, in which government sectors were represented. A policy-making body, NNCC was responsible for initiation and operation of the project.
- At programme level was an Expert Committee comprising at least one member from each sector, two nutrition experts and one senior staff member from Tribhuvan University. The member representing each sector was the chief of the ministry nutrition unit or university department. The committee provided guidance to operating committees. The project director was the secretary of the Expert Committee.
- At the third level was the Project Operating Committee, headed by the project director, with one member from each sector. The operating committee in each sector was responsible for implementation of project activities. The Project Operating Committee played a crucial role in implementing and monitoring activities. Committee members saw to preparation, improvement and testing of curricula and teaching aids. Members of these committees were ex-officio members of the Expert Committee. Arrangements for coordination at various levels were thus very effective. On occasion, one sector helped others by coordinating their programmes. Experts were exchanged from time to time in developing curricula and teaching materials and conducting training programmes and other project-related activities.

Multisector representation in the Expert Committee provided every sector with the opportunity to discuss problems, which were analysed by the Coordination Committee before action plans were developed. Analysis of any problems was considered relevant to everyone.

Coordination among the implementing sectors was a key feature in the innovation, which led to successful completion of the project. This proved to be one of the best models for implementing problem-solving strategies at community level.

Another innovative characteristic was the mechanism of integration. The project was able to demonstrate that integration of problem-oriented concepts into government training and education was possible. This ensured that a large proportion of the Nepalese population could, at little cost, be informed about how to prevent problems like malnutrition and vitamin A deficiency and reduce the risk of loss of sight by preventing illnesses such as measles and diarrhoea among children. The innovative experience gained in the project opened the way for concepts related to other social problems – population, the environment, drugs and AIDS – to be integrated into curricula in educational institutions and training centres. As these new nutritional concepts have to be integrated into subjects with an already substantial content, curricula must not be overloaded at the planning stage.

The innovative experience developed integrated curricula on nutrition with special emphasis on vitamin A for six different sectors through coordinated efforts. This involved bringing together technical and experienced personnel in the different sectors to propose sets of curricula and prototype teaching materials for the common goal of eliminating nutritional and vitamin A deficiency problems. The problem of vitamin A deficiency arises from multiple causes. In Nepal, the efforts of only one or two sectors to address vitamin A deficiency had not been successful. It was recognized that the solution lay in developing an approach based on ministerial coordination and public and private-sector collaboration.

The uniqueness of the project was the way in which so many high-level personnel were brought into a forum to find solutions. There were differences in level and coverage of curricula and teaching materials integrated into the sector programmes. Style of presentation and depth of detail, use of illustrations and exercises and selection of content differed from one sector to another but the impact of the curricula and materials was generally positive.

The phase II project, Extended Multisectoral Training Programme on Nutrition for the Prevention of Vitamin A Deficiency, has yet to materialize but the curricula and teaching materials are still in use. The government is committed

to eradication of malnutrition and vitamin A deficiency. Training centres and other institutes are under its jurisdiction, which allows the government to pursue its commitment to implement nutrition and vitamin A curricula.

Continuity of the programme is essential and a means of institutionalizing it must be found. There should be a mechanism to monitor and supervise the programmes. Unless integration of new concepts into curricula is well monitored, there is a danger that they may be lost over time.

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