Vitamin A deficiency, fruit and vegetable consumption, and nutrition education: villagers’ perceptions in Nepal

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Abstract  Proper utilisation and consumption of available food resources have a pivotal role to play in the fight against hunger and malnutrition in the world. However, this role is highly affected by social and cultural factors within the relevant community and these often result in a lack of appropriate understanding of the value of available food resources for maintaining people’s health. This study examines the perceptions of rural Nepalese concerning the importance of the consumption of vegetables and fruits in alleviating vitamin A deficiency in their villages. The main message to emerge from the study is that, despite being strongly influenced by their own cultural and traditional practices, the villagers prefer to have appropriate nutrition education so that they can better understand the value of vegetables and fruits in alleviating the vitamin A deficiency in their villages. They asserted that such education should be based on an information-sharing process rather than a one-way, prescriptive method of information dissemination. (Aust J Nutr Diet 2001:58:186–191)

Key words: vitamin A deficiency, vegetables, fruits, nutrition education.

Introduction

Food provides the body’s physiological demands and satisfies certain emotional and social needs (1). However, all of these functions of food are predominantly related to cultural and traditional practices and values. Thus, many anthropologists involved in the study of food behaviour place emphasis on beliefs, preferences and cultural values of people (2). Harrison, however, explaining the impact of such cultural and traditional values and practices, especially within the context of developing countries, highlights many damaging effects of these values and practices on human health and survival (3). Similarly, Bryant et al. highlight how each ethnic group encourages its own food practices on human health and survival (3). Similarly, Bryant et al. highlight how each ethnic group encourages its own food practices on human health and survival (3).

In order to maintain a healthy life with better nutrition, people need to know the importance of foods readily available for their disposal, otherwise they may starve or become malnourished. Berg cites an example of Indian refugee camps in 1971 where malnutrition raged among young Bangladeshi refugees, even when adequate foodstuffs were available to their families. He argues, many nutritional deficiencies would be moderated if people knew how better to use the resources already at hand’ (6).

Nepal, like many other countries, has its own traditional and cultural practices in relation to food production and consumption. Food production and consumption vary depending upon the geographical regions of the country. Based on the topography, the country has been divided into three geographical regions: plain region, hill region, and high hill region. The plain region is the low flat land area of the country that runs from east to west along the northern side of India. The hill region, on the other hand, is situated in the middle of the country with altitudes varying from 610 m to 4877 m above sea level, while the high hill region lies in the northern part of the country where Mount Everest, locally known as Sagarmatha is located (7).

According to the 1991 census, Nepal has a total population of 18.5 million, of which, 46.3% live in the plain region, 45.9% in the hill region, and 7.8% in the high hill region. These regions cover 23%, 41.8%, and 35.2% of the total land area of the country respectively (8).

The people of the plain region grow mainly rice, wheat, legumes, vegetables and fruits. Rice and wheat are the staple foods providing most of the carbohydrate. Leguminous foods such as lentils and beans form a major part of the daily diet while meat consumption is occasional, as it is expensive. Vegetables and fruits, on the other hand, are reasonably affordable foods, including those that contain carotenoids, the vitamin A precursor. Due to the fertile nature of the land, this region historically has been self-sufficient in food and it supplies foods to many areas of the country with food deficiency (9).

People in the hill region grow rice, maize, millet, wheat, vegetables, and some fruits. The main carbohydrate-rich staples are rice, maize and millet. Unlike the plain region, this region does not grow or consume much leguminous foods. For the majority of people, meat is an expensive food eaten either during festivities or on special occasions. Vegetables and fruits are consumed only when they are in season (10).

The high hill region grows mainly millet and barley. This region is where the country produces lots of fruits, including apples, peaches and apricots. Millet and barley contribute most of the dietary carbohydrate. Meat is frequently eaten as many people in this region raise yaks (mountain cows) and sheep. Vegetable production is not very popular in this region due to unfavourable climatic conditions and vegetables are seldom eaten (10).
Notwithstanding what has been described above, a traditional meal (lunch or dinner) of all the people living in the various regions of Nepal is almost the same. What is locally known as bhaat, daal and terkari are the main components of a standard Nepalese meal (10). Bhaat is either boiled rice or dhindo, a hard porridge made of either wheat or millet. Daal is a lentil soup, and terkari is a preparation of cooked vegetables. Except for some parts of the high hill region, a lunch or dinner without any vegetables, specifically green leafy ones (locally known as saag paat), is regarded as a poor meal (10). This means that the people of Nepal regard vegetables as one of the important constituents of their diet. Despite this, vitamin A deficiency, particularly xerophthalmia, is a major public health problem in Nepal (11,12). A national survey on xerophthalmia reported a nationwide incidence of 1.3% for Bitot’s spots and 0.6% for night blindness among school-aged children. Both conditions are ocular manifestations of clinical vitamin A deficiency. In certain areas the incidence of Bitot’s spots is as high as 2.1% (11). For example, in the central plain region, where vegetables and fruits are plentiful, the prevalence of Bitot’s spots has been recorded at 2.1% (12). This clearly indicates that people living in this region either do not adequately utilise the vegetables and fruits they grow or do not have a good understanding of the importance of these foods. Fruits and vegetables not only protect people from vitamin A deficiency, but may also help them lower the risks of cancer and coronary heart disease (13).

In view of the high level of vitamin A deficiency, some governmental, non-governmental and international organisations, such as the Ministry of Local Development, Ministry of Education, Ministry of Health, Ministry of Agriculture, Nepal Netra Jyoti Sangh (a local organisation for blindness prevention), United Nations Children’s Fund, and the Food and Agriculture Organization of the United Nations made vitamin A-related nutritional activities a priority in some parts of the country beginning in the 1990s. In 1992, the Ministry of Health set out some guidelines for the implementation of a vitamin A deficiency control program in the country (14).

As part of a large nutrition communication research project carried out for a doctoral thesis (10), this study examined the perceptions of Nepalese villagers in relation to the importance of the consumption of vegetables and fruits for alleviating the vitamin A deficiency in their villages. In so doing, it addressed some important research questions including: what are the traditional beliefs about vegetable and fruit consumption, what are the perceptions of the villagers in regard to the activities of vitamin A-related projects, and what can be done to explain to villagers the importance of vegetable and fruit consumption in effectively alleviating the vitamin A deficiency?

### Methods of study

#### Survey districts

Three districts representing each separate geographical region in Nepal—Nawalparasi (plain region), Gorkha (hill region), and Rasnalu, Ramechhap (high hill region)—were selected for the study (Table 1). The main basis for selection of these districts was that they had nutrition projects primarily oriented towards vitamin A deficiency.

For example, Nawalparasi had an ongoing vitamin A program, which had been implemented in 1992 as the government’s first initiative to alleviate vitamin A deficiency at the national level. The main objective of this program was to prevent xerophthalmia through dietary supplementation (mass distribution of vitamin A capsules) and to achieve a reduction of vitamin A deficiency to such a level that it would no longer constitute a public health problem. A long-term goal of the program was nutrition education to bring about changes in the dietary behaviour of the target group so that vitamin A supplements would no longer be necessary.

Gorkha had a three-year pilot project, completed in 1993, carried out by an international non-governmental organisation. The main objective of this project was to reduce the incidence of night blindness in the project areas from 1.7% to 1% or less. This project used nutrition communication as a means of educating people on the production and consumption of green vegetables and yellow fruits (15).

As a part of the multi-sectoral approach to nutrition, Rasnalu, Ramechhap, had an ongoing vitamin A-related nutrition project within the broader activities of the women’s development program carried out by the government. Vitamin A-related activities were focused more on the basic nutrition education and training of mothers, including the need for increased production and consumption of vegetables and fruits.

In Nawalparasi all 77 villages were selected as survey sites as the vitamin A program covered the whole area of the district. In Gorkha, the two villages covered by the three-year pilot project were selected. In Rasnalu, Ramechhap, all nine wards covered by the women’s development program were included in the survey.

#### Sample populations for household survey and focus groups

In each of the three survey districts, 67 households with pre-school aged children were randomly selected for the survey interviews, i.e. 201 households in total. In each household, both parents were interviewed, giving a total of 402 survey respondents.

After the end of the household interviews in each survey district, ten to 15 interested villagers were invited to a focus group discussion with the village development committee chairman and local social workers. However, in each district, there were more participants than were directly invited. For example, in Rasnalu, Ramechhap, 51 people (28 women and 23 men) gathered for the focus group discussion. Despite the size of the focus group in each of the three survey districts, only five to ten people actively participated in the discussion and the majority of

### Table 1. Demographic information on survey districts

<table>
<thead>
<tr>
<th>District</th>
<th>Geographic region</th>
<th>Population (1991 census)</th>
<th>Literacy (%)</th>
<th>Main industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nawalparasi</td>
<td>Plain</td>
<td>436 217</td>
<td>40.0</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Gorkha</td>
<td>Hill</td>
<td>252 524</td>
<td>43.3</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Ramechhap</td>
<td>High hill</td>
<td>188 064</td>
<td>30.0</td>
<td>Agriculture</td>
</tr>
</tbody>
</table>
the people were inactive or passive participants or witnesses.

Household survey questionnaires, and focus group questions

For the household survey interviews, questionnaires with closed and open-ended questions were used. (The complete set of questions, including the household survey interviews, is available from the author.) All questions focused on the aims of the study. For example, questions included: what do you think, in general, about green leafy vegetables and yellow fruits in terms of their importance to your health?, how often do you eat vegetables and fruits and why?, based on your personal experience and observation, what do you think about the contribution of the nutrition project (vitamin A-related project) to your village?, and what do you think is the best way of educating village people?

In the focus group, many of the questions were directed towards the villagers’ feelings, traditions and beliefs concerning fruits and vegetables. Main questions included: what are your traditional beliefs regarding vegetables and fruits consumption?, what is your feeling about the vitamin A-related project with respect to explaining the importance of vegetables and fruits consumption?, and what can you do to explain to your village people the importance of vegetables and fruits for your needy children and women, and, of course, for yourself?

Each interview or discussion session commenced with some introductory remarks mainly outlining the purpose of such interviews and discussions and the manner in which they would be carried out. For the household survey, two interviewers with previous experience in field questionnaire survey were employed. These interviewers were assisted by the local village social worker in each of the three districts.

Focus group discussions took place either in a public meeting area, such as Chautari (paved ground under the tree) or local school. For each focus group discussion, there were two facilitators and one observer. The main role of the facilitators was to initiate discussions and provide the opportunity for each participant of the focus group to express his or her feelings relevant to the question(s) asked. The author participated as an observer and noted down important salient issues emerging from the discussions and audio-taped the whole session with the consent of the focus group participants.

Data interpretation and analysis

All the questions used in the household survey and focus group discussions were initially designed in English, and were subsequently translated into Nepali (the national language of Nepal). They were then pre-tested in some villages of the Kathmandu valley. (Kathmandu is the capital city of Nepal.) The study interviews were translated and transcribed into English by the author. The computer program, SPSS, (SPSS Inc, Chicago, SPSS for Windows, version 6.1, 1994), was used for quantitative data analysis, and NUDIST (Qualitative Solutions & Research, Melbourne, NUDIST, revision 3.0, power version, 1994) was used for descriptive and qualitative data analysis and interpretation.

Results

Villagers’ traditional beliefs about vegetables and fruits

The majority of the focus group participants indicated that, traditionally, vegetables and fruits were not considered to be important for health. A female focus group participant of Nawalparasi, offered a representative comment: ‘The traditional belief is not that [vegetables] contain vitamins necessary for our body but that we should eat them frequently, as they are a part of our daily meal.’ In the Ramechhap focus group, a male participant said: ‘We have traditionally used green vegetables and yellow fruits as normal traditional foods’. In view of traditional practices, a majority of focus group participants believed that their meal is ‘incomplete’ without some vegetables.

In all survey districts, many focus group participants viewed the inclusion of vegetables in their daily meal as strongly associated with the taste of food. Commenting on this, one of the male participants of the Nawalparasi focus group commented that ‘vegetables add taste to meals’. This suggests that villagers eat vegetables largely for taste rather than for good health.

Field observations in all three survey districts confirmed that the majority of villagers do eat vegetables and fruits particularly when they are in season. One of the male focus group participants of Nawalparasi referring to the general practices of the villagers commented: ‘Nobody has to teach the villagers to eat fruits and vegetables as they eat them during their seasons according to traditional practices’. However, unless they were otherwise reminded of fruits, the focus group participants in all three survey districts tended to mention only vegetables during the interviews. The reason for this could be that vegetables traditionally constitute a part of the daily meal of many Nepalese people, while fruits are eaten only occasionally when they are available. Table 2 shows the frequency of intake of vegetables and fruits in the three survey districts, based on the household survey data analysis, and indicates that vegetables are consumed more frequently than fruits.

Most of the focus group participants indicated that fruits were thought of as a less important food compared with vegetables. Apart from this, seasonal availability and access substantially affected the frequency with which fruits were eaten by the villagers. It was reported that most villagers had difficulty in gaining access to fruits since many of them do not possess their own fruit trees or could not afford to buy them.

Villagers’ perceptions towards vitamin A-related projects in their villages

There were mixed feelings among respondents to the household survey and the focus group participants in relation to the question about villagers’ perceptions in regard to the activities of vitamin A-related projects.

The majority of the focus group participants in Nawalparasi claimed that the vitamin A project in their village was implemented in absence of village consultations: ‘Nobody from the project came to approach us’. They asserted that a majority of the villagers did not know any-
thing about the activities of the project and that the project had done nothing for their village. They further stated that due to a lack of dissemination of information many people did not gain the benefit of vitamin A capsule distribution. It is evident from the household survey data (Table 3) that in Nawalparasi there was a very low level of familiarity with, and participation in, the vitamin A project by the villagers. Many focus group participants in Nawalparasi expressed the view that this was due to the lack of communication with the villagers. A representative comment made by one of the female focus group participants clearly reflects this view:

In October to November 1993 vitamin A was distributed for children. I was, by chance, very lucky to know about it from someone whom I met at the local market while shopping. Otherwise, I would’ve missed it out, for there was no information at all in my village about it.

In Gorkha, despite there being a larger number of villagers who were familiar with, and had participated in, the project, many focus group participants raised serious concern about the use of the local village people in the information dissemination process of the project. They believed that the local men and women who received training from the project staff did not share project information with the villagers. The most common view was that:

Though the project tried to impart knowledge about green vegetables and yellow fruits, [the local men and women who received training] were not bothered to share the knowledge they received from the training.

Many focus group participants remarked on this situation as inhibiting access to project messages and information by ordinary villagers. At the same time many focus group participants strongly believed that information should be shared for the benefit of the entire village: ‘We should learn that we should share our knowledge with other villagers so that information can travel across our village. It is not justifiable that we get training and training allowances, but do not share our knowledge with others’. The majority of the participants supported this view, seeing knowledge-sharing as an integral part of nutrition communication in their villages.

Regarding the main theme of the project message, many of the focus group participants in Gorkha agreed that they had learned about the importance of vegetables and fruits, especially of those vegetables that can prevent vitamin A deficiency: ‘Now we know the importance of green vegetables. However, the villagers cannot grow them sufficiently due to a lack of water’. A female focus group participant stated: ‘The project was good in that it taught us to consume green vegetables regularly to protect our eyes, which we did not know before’.

Many of the focus group participants in Gorkha accepted that the vitamin A-related project taught them the importance of vegetables in alleviating vitamin A-related diseases, but a deep anxiety was expressed by one of the participants about the misuse of vegetables.

On many occasions, I have advised my fellow villagers not to sell green leafy vegetables and use them for their own consumption, but they do not listen to me; they would rather exchange them for cigarettes or alcohol. They don’t give a damn about their health.

This suggests that simply providing the target population with knowledge about food does not necessarily change the people’s nutritional behaviour. It further suggests that, although an improvement in people’s economic status may be needed to secure better nutritional health (10), many poor people tend to use their available financial resources on non-essential commodities such as cigarettes or alcohol.

Many focus group participants in Gorkha also argued that the level of information provided by the project to the villagers was not sufficient to change their behaviour. One female participant stated: ‘Although we know we must eat green leafy vegetables and yellow fruits regularly to protect our eyes, many of us still do not know why this is so?’ This view suggests that the villagers were not satisfied with the project information. They wanted to know more about the use of green leafy vegetables and yellow fruits.

In Rasnalu, Ramechhap, where many of the household survey respondents indicated their familiarity with and participation in the project, many focus group participants strongly believed that the project had helped them to understand the importance of green leafy vegetables in the protection of eyes: ‘the staff of the project have talked about the importance of green leafy vegetables for our eyes, which we did not know before’. However, by contrast, many of the focus group participants indicated their dissatisfaction with the way that the project initially operated in their villages. Many reported that initially the project staff were not bothered to discuss their activities

### Table 2. Frequency of intake of green leafy vegetables and fruits in households as reported by female respondents (total n = 201)

<table>
<thead>
<tr>
<th>Region</th>
<th>Vegetables</th>
<th>Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; once Weekly</td>
<td>&gt; once Weekly</td>
</tr>
<tr>
<td></td>
<td>Daily a week or less</td>
<td>Daily a week or less</td>
</tr>
<tr>
<td>Nawalparasi</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>Gorkha</td>
<td>54</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Ramechhap</td>
<td>42</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>58</td>
</tr>
</tbody>
</table>

### Table 3. Familiarity, participation, education and communication with the vitamin A projects in the three districts as reported by male and female respondents in the household survey (total n = 402)

<table>
<thead>
<tr>
<th>District</th>
<th>High (n)</th>
<th>Reasonable (n)</th>
<th>None (n)</th>
<th>Partial (n)</th>
<th>None (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nawalparasi</td>
<td>7</td>
<td>11</td>
<td>116</td>
<td>5</td>
<td>129</td>
</tr>
<tr>
<td>Gorkha</td>
<td>92</td>
<td>9</td>
<td>33</td>
<td>99</td>
<td>35</td>
</tr>
<tr>
<td>Ramechhap</td>
<td>60</td>
<td>6</td>
<td>65</td>
<td>52</td>
<td>82</td>
</tr>
</tbody>
</table>

(a) High, know exactly what it is all about; reasonable, know generally what it is all about; none, not familiar at all.

(b) Partial, taking part in some stage of the project, usually at the implementation or beneficiary level; none, no participation in any stage. There was no ‘full participation’, taking part in all stages of project design, development, implementation and evaluation.

(c) Figure includes male survey respondents who were interviewed for this study, but were not the target group of the women’s development program.
with the people of all the wards of the village. As a result, their activities became limited to only some of the wards. None of the members of the remaining wards were interested in their activities. Only after a year of the project, did its staff realise the necessity of the participation of these wards, and they invited representatives (one male and one female) from all these wards to discuss their participation in the activities. Otherwise, as one focus group participant remarked, the project would have had great difficulty in working with the people in the village.

Best ways of informing village people about alleviating the vitamin A deficiency in their villages

The household surveys and focus groups indicated the majority of villagers preferred to have two-way communication with project staff. They believed that the method of dissemination of vitamin A-related information in their villages was simply based on a one-way communication process: from project staff to villagers. The project staff did not seek the villagers’ input either through consultations or meetings or discussions of the program content. Being totally discontented with such a conventional one-way communication process, one male focus group participant put forward the villagers’ common view:

Development should not occur by force through the program or project, rather it should occur through a joint undertaking between the program and the local people, because we villagers are not just puppets with which you can play around as and when you wish.

The above view suggests that, in order to achieve nutritional development goals and objectives, a project should always have a dialogue or consultation with the village people to discuss matters of interest to them as they do not necessarily come forward to negotiate with the project staff unless they are approached by the latter.

The household survey data in all three survey districts indicated a group meeting or discussion was a preferred method of two-way communication (Table 4). Seemingly, many focus group participants in all survey districts put emphasis on a two-way communication process that they believe ‘can help infuse effective nutrition education and information for the villagers through sharing ideas and information between the project staff and villagers themselves’. They argued that they had a capacity to adequately share their local knowledge and information with project staff and this could be useful in the process of alleviating the vitamin A deficiency. For example, they believed that they could share information about locally available wild vegetables and fruits that are largely being eaten by only the poorer sections of the village population that are largely dependent on these foods:

Table 4. Preferred methods of communication, as reported by male and female respondents in the household survey (total n = 402)

<table>
<thead>
<tr>
<th>District</th>
<th>Being a member of a group meeting or discussion (n)</th>
<th>Being a member of a consultative committee (n)</th>
<th>Having interpersonal discussions (n)</th>
<th>Consulting with a spokesperson for the village (n)</th>
<th>No answer (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nawalparasi</td>
<td>87</td>
<td>5</td>
<td>22</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Gorkha</td>
<td>95</td>
<td>6</td>
<td>11</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Ramechhap</td>
<td>109</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

We should be involved in nutrition education because we know which foods are easily available in our villages, but we don’t know their utility and importance. We will learn their importance if we take part in the nutrition education program and share the knowledge among ourselves.

In Rasnalu, Ramechhap, many of the focus group participants indicated their interest in using more locally available wild green vegetables if they are nutritious:

There are some vegetables which are easily available in our waste lands and in nearby forests, such as garlic pears, amaranth, pigweed, lamb’s quarters and stinging nettles that have long been used by poor people as their food. But others do not care for them, which is no good. We can use them as an alternative supply of vegetables when required.

In Nepal most of the wild vegetables are traditionally considered as ‘inferior foods’. For example, in Nawalparasi, when the author suggested to a group of high school students that they could utilise locally available vitamin A-rich wild green leafy vegetables, such as stinging nettle (urtica dioica), for the prevention of vitamin A deficiency, almost all of the fifty students reacted negatively, as though it was a disgusting idea. In fact, wild vegetables, including amaranths (amaranthus leucocarpus), pigweeds (amaranthus vididis), stinging nettles (urtica dioica), and garlic pear (craetaeva religiosa) are considered as inferior foods all over Nepal and are eaten only by very poor and low caste people. Despite this, some of the high caste focus group participants in Gorkha stated that this situation ‘…based upon traditional, cultural and religious practices is gradually disappearing’. They strongly contended that there is an absolute need for nutrition education for villagers to alter misconceptions about the locally available food resources. Similarly, they also believed that a two-way exchange of information in the nutrition education process may help solve the problems regarding utilisation of vegetables in the villages.

Referring to nutrition education, one of the female focus group participants of Nawalparasi, who previously had been a nutrition worker for the vitamin A project, highlighted the urgency of a two-way exchange of information especially in relation to the method of cooking vegetables in the villages. The method of cooking vegetables in Nawalparasi appears to have reduced their nutritive value. According to traditional village practices, the green vegetables are chopped and then steamed. When they are half steamed, they are squeezed to drain all the water out of them and, once dry, they are fried with oil and spices. With this method, nutrients, including the vitamin A precursors (carotenoids) cannot be fully retained (16, 17). Such ways of preparing vegetables, rather than the availability of vegetables, may have been one of the major factors leading to vitamin A deficiency in Nawalparasi and the remaining parts of the plain region.
Discussion

This study substantiates the proposition that cultural and traditional practices of villagers in Nepal strongly affect their food consumption behaviour. It also suggests that the villagers studied have a positive attitude towards changes in their food behaviour if provided with an opportunity to be involved in a more inclusive and two-way educational and informative system by a nutrition project. Such a two-way system of education and information dissemination may help villagers become more affiliated with and participative in projects aimed at resolving nutritional problems. Participative activities are central to the concepts of social learning theory that focus on problem-solving through ‘action, reflection, communication and cooperation’ (18). Problem-solving in a true sense is essential to nutrition education and information as it has the potential to bring about positive changes that may make a significant difference in the nutritional wellbeing of many people (10). Hence, it is recommended that while designing and implementing a nutrition program, the local people’s participation in this process should be a top priority for its success.

Local people’s participation may help a nutrition program to establish a functional system that involves interactive sharing of knowledge and information between program participants and program staff. Sharing of knowledge and information may address many contemporary problems such as those concerning dissemination of information, use of locally available wild vegetables and fruits, and cooking methods. A two-way information sharing process may also help nutrition program staff to understand what participants of the program want to learn, how they want to learn, and why they want to learn, and thus contribute to the development of an effective learning process.

The villagers’ concern that insufficient information was given to change their behaviours may be connected with the views expressed by McAnany who believes that poor people are always sceptical of external help (19). For this reason, they do not readily absorb information unless they are fully convinced. Similarly, as Clift and Freimuth contend, ‘people learn new behaviours best when they want to learn, and why they want to learn, and thus contribute to the development of an effective learning process.

The need to establish two-way communications is evident in other populations with nutritional problems. The higher prevalence of diabetes among indigenous people of Australia (21) indicates changes to their dietary habits are needed (22). Pincker Nyurrrinyin, a great Aboriginal Gurindji thinker and lands rights activist, considers an exchange of knowledge between black and white needed (23). This reinforces the importance of the two-way communication process.

It may be argued that only a truly participative two-way learning process, involving genuine representation of local people in the program design, implementation and evaluation process can enhance the chance of better success of a program or project. However, research defining the limitations and boundaries of full participation of local people and the use of two-way interactive communication needs to be conducted in order to evaluate its effectiveness.

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15. Vitamin A deficiency in Nepal