

Major issues in assessment of nutritional status of communities

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INTRODUCTION

The World Declaration and Plan of Action for Nutrition adopted at the International Conference on Nutrition in 1992 has emphasised on the importance of activities to identify the priority nutritional problems in the country, analyse their causes, plan and implement appropriate remedial actions and monitor and evaluate efforts to improve the situation. Governments are urged to establish or strengthen data collection, analysis and reporting systems. Basic and on-going training of personnel in relevant agencies involved in these activities should be provided. Countries are also urged to promote regional and international collaboration in gathering food and nutrition information and in surveillance and early warning activities.

All countries are in various stages of developing national plans of action for nutrition to improve the nutrition situation of the respective populations. One of these activities would be the strengthening of assessing, analysing and monitoring of nutrition situation in the country. It is in this context that a scientific meeting on the assessment of nutritional status of communities is proposed. This would provide the forum for updating and exchange of experience and knowledge on the methodologies for the assessment of nutritional status among countries in the region. The gathering would also serve to facilitate closer collaboration among countries in these activities. The Institute for Medical Research (IMR) in Kuala Lumpur, as the Regional Centre for Research and Training in Tropical Diseases and Nutrition had taken up the responsibility of organising the proposed seminar, the first in the region. The Seminar was held in Kuala Lumpur from 12-14 November 1997.

OBJECTIVES

1. To provide a forum for update and exchange of experience and knowledge on the methodologies for the assessment of nutritional status among countries in the region
2. To facilitate closer collaboration among countries in efforts to monitor the nutritional status of communities

ORGANISING COMMITTEE

The Seminar was organised by the Institute for Medical Research, co-organised by the Nutrition Society of Malaysia and supported by the World Health Organisation. A multi-agency organising committee was formed to organise the meeting, including nutritionists from Universiti Putra Malaysia and Universiti Kebangsaan Malaysia. Senior scientists from the various key institutions in the region served as members of the International Organising Committee of the Seminar including from the Food and Nutrition Research Institute of the Philippines; the Institute of Nutrition, Mahidol University, Thailand; Ministry of Health Singapore; Nutrition Research Centre, Bogor, Indonesia and the National Institute of Nutrition, Vietnam.

PARTICIPANTS

A total of 130 nutritionists, dietitians, medical officers, researchers, lecturers working in the area of assessment of nutritional status from the countries in the region participated in the Seminar. 25 foreign participants from 8 countries are in the meeting, namely from Australia, Brunei, Indonesia, Laos, Mongolia, New Zealand, Philippines, Singapore, and Thailand. These foreign participants are from 14 organisations. Professor Rosalind Gibson from the University of Otago, Dunedin, New Zealand and Dr Lynne Cobiac from Commonwealth Industrial and Scientific Research Organisation (CSIRO), Sydney, Australia were invited as resource persons to the Seminar.

A total of 105 local participants attended the seminar. These included 26 health staff (medical doctors, nutritionists and dietitians) from various state health departments and hospitals. The other local participants were from 16 organisations in the country including local universities, private hospitals, teaching colleges, and research institutions.

SCIENTIFIC PROGRAMME

A total of 32 papers were presented in the 3-day meeting. These papers were presented by 26 speakers in 6 sessions, namely a session on general topics, dietary studies, biochemical determinations, anthropometric measurements and miscellaneous topics. At the end of each session, a round-up discussion was held to summarise, analyse and discuss the papers presented in that session, examine commonalities and differences among countries in the region. Wherever relevant/possible, recommendations on specific topics were made.

Topics that were covered included methods for the assessment of

- protein-energy malnutrition,
- vitamin A deficiency,
- iron deficiency anaemia,
- other micronutrient deficiencies
- obesity and hyperlipidemias.

Included in the discussions were clinical, anthropometric and biochemical methods and the introduction of software for data analysis. Methods for the assessment of food consumption and

for the analysis of these data were also included. In the final session, a summary of the highlights of the seminar was presented by the Chairman of the Organising Committee.

HIGHLIGHTS OF DISCUSSIONS

Dietary studies

A total of 11 papers on dietary studies was presented the topic with the most number of papers in the Seminar. Various issues and concerns on carrying out dietary studies were discussed. There is probably no best method for dietary studies, although the food weighing method is usually considered the reference method. It is important to carry out validation of different dietary methods using this method.

The food frequency method is widely used has also been found to give similar findings. This, however depends on the socio-economic status of the study subjects. It was also pointed out that the food frequency method may encounter problems in implementation in some communities. The meeting recognized that especially with young children, dietary studies are particularly difficult to conduct and would need the full cooperation of the mother or guardian.

The problems associated with estimation of portion size in dietary studies were discussed at length. Especially for mixed dishes with multiple components, as found in many Asian communities, it is difficult to estimate the portion for each food component. In addition, items in mixed dishes may be missed out. Several papers were presented on a variety of procedures studied or developed to improve reliability of estimating portion size. The use of food models of different sizes, cups and measures, photographs of actual sizes of food and geometric shape models was described. Especially if a single day 24-hr recall is used, it would be useful to carry out repeats of 24-hr recalls on a sub-sample of the subjects to adjust distribution of observed intakes for intra-subject variation.

The need for a good food composition database was emphasized. More data on cooked foods are also required. As an interim measure, conversion factors for cooked foods may be used. The meeting also emphasised the importance of including non-nutrients in future works on food composition database In relation to this, the meeting was informed of the availability of computerised nutrient analysis systems in the region, eg recent work by Malaysia and the Philippines. The former is available commercially. Such softwares would be useful for handling voluminous data and minimise errors in calculations.

In view of the numerous difficulties encountered in carrying out dietary studies, it has been recommended to also simultaneously carry out analysis of biochemical markers. It was also noted, however, that this may not be always possible nor desirable, eg the presence of infection may affect some markers. The meeting emphasized the importance of drawing appropriate conclusions from dietary studies, recognizing the limitations of the methods used.

There was considerable interest in studies into dietary zinc intake in view of the importance of the element in human nutrition. An interactive 24 hr recall method for assessing micronutrients

eg Zn and Fe was described. Dietary components influencing bioavailability of Zn should be considered, eg phytate analysis should also be carried out.

Various other issues were also discussed. The use of Caco-2 cells was described as an appropriate in vitro method to study the bioavailability of iron. The meeting took note of the use of computerised questionnaire forms for dietary studies such as being used in the New Zealand National Nutrition Survey. Participants were also informed of the interest of Codex to collect food intake data that are also useful for assessment of risk to toxicants eg pesticide residues and heavy metals.

Biochemical determinations

Zinc deficiency is gaining recognition to be of public health importance and zinc with iron supplementation has been provided for various communities. It was recommended that countries in the region should consider assessing Zn status, especially in view of the high prevalence of iron deficiency anaemia. Clinical diagnosis may not be easy as there are no specific clinical features. There is no single sensitive and specific laboratory index for diagnosis of Zn deficiency but the determination of distribution of plasma and hair Zn levels should provide useful information. These could be determined by atomic absorption (flame) or colorimetric methods. Other biochemical and/or physiological functional indices can also be used. Deficiency can be confirmed by positive response to Zn supplementation but this is not always practical to conduct. There is also a lack of other basic data such as Zn content of foods and RDAs for the element. For the latter, it was recommended to consider adopting RDAs from WHO for interim use.

Conjunctival impression cytology is a relatively cheap technique for the diagnosis of vitamin A deficiency. There are, however, inherent problems such as collection of specimen, fear of the child. It also requires skill of the collector as well as for processing of the strips. The technique is not widely used in the region.

A paper on rapid diagnosis of iron deficiency anaemia was presented. The problem with the use of the colour scales was highlighted. Improvements need to be made to the procedure even if it were to be used as a rapid screening tool. The procedure is not widely used in the region.

An HPLC method for simultaneous determination of retinol, several carotenoids and tocopherol was presented. The determination of these antioxidant vitamins is gaining importance in view of their possible role in the prevention and control of several chronic diseases, eg CHD and cancers. The paper also called for a review of the cut-offs for retinol and tocopherol. An HPLC method for determination of serum retinol using micro volumes of blood was also proposed to enable biochemical screening of young children to be carried out.

On a general note, participants emphasized the importance of quality control in biochemical determinations in the central laboratory as well as in the field.

Anthropometric measurements

The importance of using standardised weighing equipment was emphasized. It is not always possible to use sophisticated scales. Sometimes bathroom scales need to be used because of the ease of carrying them around. It was pointed out that errors are not linear in bathroom scales, and therefore we cannot use a simple correction factor for all measurements. It is however important to calibrate all equipment used, whatever type. When it not possible to use standardised weight for calibration, one can improvise and use for example a bucket of water with known volume for calibration. It is also important to bear in mind very basic procedures such as setting equipment at zero every time and using instruments on a level surface. The meeting was informed that UNICEF is now producing or has made arrangements with SECA to produce relatively cheap and accurate weighing scales. Field trials have been carried out on these. Participants are encouraged to consider these for use.

In relation to anthropometric measurements is the problem of establishing age of children (required for age-for-age and ht-for-age). Although birth dates are available in most countries in the region, errors can occur in during calculation of age, especially in the field.

With regards to skinfold measurements, it was pointed out that plastic skinfold calipers are not recommended for research/surveys purposes and that only precision ones should be used. It is important to mark the sites before doing the skinfold measurements so as to minimize errors. Some participants felt that skinfold measurements can be extremely difficult to obtain in certain communities where the people are reluctant to remove clothing for measurements.

A few innovations in anthropometric measurements were reported eg the development of rapidly interpretable growth chart with built-in age calculator by Thailand. The tool is said to be useful for immediate age calculations for use in field conditions.

Experiences with the use of NCHS Z scores for adolescents were reported. The appropriateness of the use of BMI-for-age was discussed, including its use for younger adolescents. It was felt important also to focus on this population group as well. The relation of anthropometric data to health risks need to be established. Further studies are required before recommendations for revision of cutoffs for BMI-for-age in adolescents can be made.

The lack of longitudinal data on growth was noted. These may be useful for the preparation of cut-offs in anthropometric measurements. It is also important to study pubertal stage/development which are useful in studies of body composition. The collection of other measurements together with BMI was suggested, eg sitting height. Skin fold measurements should also be included so as to assist in establishing cut-offs.

Diet-related chronic diseases

There were less papers presented in this area. The main topics discussed included cellular changes in carcinoma, lipid profile, hypertension, lipoprotein(a) and homocysteine. There was a suggestion from Malaysian data that lipoprotein-a is a superior indicator for assessing risk to CHD compared with conventional serum lipid profile. In diabetes mellitus the determination and uses of glucose, GTT, glycolysated Hb and insulin resistance were discussed. There was considerable interest in the measurements of obesity and their limitations. Other lifestyle factors

are also important, eg smoking, alcohol intake and physical activity. The importance of nutrition screening of the elderly was emphasized as the proportion of elderly is increasing in countries in the region.

General aspects

Serious attention should be given by investigators to ensure accuracy of data collected. It is important to consider how to check for accuracy of massive data available. One procedure is to carry out a repeat (duplicate) study on a sub-sample of the subjects. It was also noted that the meticulousness of this kind of validation sometimes wanes from the initial enthusiasm.

It is important to standardise measurement techniques by different research assistants or workers (inter-examiner error). After training of the worker, it would be good to perform a test on groups of children of the same age to be measured in the study. The research assistant is asked to perform repeated measurements on each child to calculate technical error of the measurement.

In mass weighing of subjects in the community, it is important to involve the community as it creates awareness of nutrition amongst the people. An important constraint and problem of such activities is inadequate training of research assistants. The use of local manpower is important as they understand the local conditions and the community. The Philippines reported on their experiences and noted that systematic training programme is essential to produce a pool of reliable resources. It is also important to beware of possible inappropriate use of the data collected, eg people who use the data are not aware of limitation of the data. interpret differently by persons to serve their purpose. A note of caution was also given if another set of data is available, eg from national nutrition survey.

It is well known that country differences exist for the various references. It would be important to understand to what extent harmonisation and cooperation can enhance work in the region. Several areas of possible collaboration exist in the region, eg RDAs, FCTs and growth references. Some initial activities have already been carried in these areas. In the area of FCTs, efforts in harmonising data generation and compilation of the ASEANFoods database. A workshop to harmonise RDAs in the region is to be organised by ILSI follow up to the seminar by ILSI earlier this year.

Other topics discussed include qualitative rapid assessment procedures. It was reported that these do provide useful information in a short time. A report on energy expenditure measurements to predict energy requirements was also presented. In another issue, the question of how much other data could be loaded together with dietary studies was discussed. It was felt important not to stress the respondent too much and the duration of study is important.