Assessment of nutrition-related knowledge, skills and attitudes

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Summary

In this introductory paper, it is specially stressed that nutrition education is not primarily a cognitive problem but an affective one.

After defining the concept of knowledge, skills and attitudes, an overview of the assessment problem is attempted.

It is suggested that validity and feasibility reasons are in favor of the anthropological (vs. the nomothetic) paradigm. The importance of the whole situational context is emphasized.

A short discussion of the level of definition of objectives, and of populations follows. As for experimental designs, proper experimental designs or even quasi-experimental designs do not often seem applicable.

In the section on assessment instruments, the measurement of attitudes or, better, the probability of engaging in the target activity is the main focus.

Finally, in the dilemma of internal vs. external validity, internal validity seems to deserve priority.

Key words: nutrition education – evaluation – knowledge – skill – attitude – reliability – validity – generalizibilty

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Introduction

Some twenty-five years ago, I was invited for expert advice to a U.S. office preparing a nutritional intervention in an African area where I had worked earlier. In fact, the people who called me had already made up their mind and just wanted reinforcement. They informed me that proteins were really a must in most malnutrition cases and that they had found an obvious solution: give a lot of hens and cocks to those poor Africans so that their children can have an egg every morning. That was it.

I could have tried to explain the finesses of tribal rules and taboos. But this was not even necessary for, in the area under consideration, the local population would in all likelihood eat the hens and cocks on their very arrival. And if by chance they did not, a rule forbade them to feed animals, for doing so would mean becoming animals themselves.

The sons of the 18th-century enlightenment keep thinking that scientific information and a normal endowment of reason suffice to elicit enlightened behavior.

It is highly significant and fortunate that this workshop has been entitled Evaluation of Nutrition Education in Third World Communities and not simply in the Third World. It shows from the beginning that the organizers are acutely aware of the specificity of the field where education has to take place. Indeed, what is true in one bush village or family is not often the rule in the next one.

In other words, nutrition education is not primarily a cognitive problem but an affective one. As a consequence, any assessment that does not take affects into account is likely to be of doubtful significance.

Let me say to conclude this introduction that the Third World comprises a large array of cultures and subcultures which are likely to pose specific problems. In this paper, I refer implicitely to my African experience (south of the Sahara).

1. Definitions

1.1. Knowledge and skills

1.1.1 *Knowledge* is here understood as verbalized or demonstrated ability to reproduce from memory facts, principles, recipes, etc., related to nutrition.

1.2 *Skill* is here understood as the ability to elicit concrete nutritional behavior corresponding to a specified lower or higher cognitive level.

1.2.1 Comprehension and application are here defined as problem solving on the lower cognitive level: all or all but one items of information needed to solve the problem are included in the question.

1.1.2.2 Analysis and evaluation

1.1.2.3 Synthesis and divergent productions

1.2. Attitudes

Attitude is here understood as a lasting emotional, motivational, perceptual and cognitive organization of beliefs that tends to influence positively or negatively group or individual behavior towards a specific object. While

in certain contexts or social settings the correlation between attitude and actual behavior may be rather low, in others it is very high and even nearly perfect. This latter situation often exists in traditional cultures with strong religious beliefs.

2. Assessment methods

2.1. *A crucial issue: the nomothetic versus the anthropological paradigm*

Hard evaluation of statistically representative samples of populations is a paradigm hardly applicable in many field situations encountered. This is, among other things, due to the large diversity of languages and the difficulty in conveying science-originated concepts (i.e. protein, full meal) in local languages; illiteracy, lack of means of communication (i.e. no postal service), etc. are further stumbling-blocks.

As a consequence, direct use of written questionnaires is impossible and the lack of skilled and socially acceptable interviewers, combined with communication difficulties, leaves little possibility for properly carried-out surveys.

That is why the anthropological approach (in the full meaning of this term) is preferred both for validity and feasability reasons. In this perspective, case studies and the case study method are points of departure and «local knowledge» constitutes the first stage of any significant assessment. It is hoped (and already established to some extent) that principles and generalized approaches can be induced from these idiographies.

It must be stressed that the nutrition problem is multidimensional and is practically impossible to understand if isolated from its overall context. PELTO (1981, pp. 2–8), referring to systems theory, writes: «One value of the emphasis on systems is that it promotes the search for additional significant factors that affect the behavioral domain of research, reminding us of incompleteness of those components in relation to human psychological needs.»

More specifically, it must be borne in mind that the people we try to educate know the foods and can cook. Their attitudes are often rooted in ancestral tradition.

Therefore, the evaluation must begin with a description of the family, as well as the socioeconomic and cultural framework within which existing knowledge, skills and attitudes – in their hypothetized relation to nutrition problems – have developed.

Education and evaluation of induced behavioral change must take into account not only the desirability of change in some nutrition-related behavior (which seems responsible for malnutrition), but also the feasibility of this change (which must not ruin the adaptation process of the individual to his environment).

2.2. *Definition of objectives*

Objectives are to be defined according to the instructional level, the cognitive abilities and the affective profile of the target population.

Modifications of nutrition-related behavior are the *terminal objectives.* Knowledge, skills and attitudes in the field of nutrition would normally be considered as *intermediary objectives* and their achievement assessed as such. This may reflect, at least in some cases, too intellectualized an approach.

It has for instance been observed that although unable to classify the food into the three basic categories, some mothers produce dietetically better meals after the educational sessions: and this by sheer imitation. They have identified some foods that are both recommended by the educators and culturally acceptable for them. In this case, the terminal objective is achieved to some extent while an evaluation bearing on the intermediary objectives would yield negative results.

That is why direct observation before and after treatment remains of primary importance.

2.3. *Populations*

2.3.1. *Communities in urban areas*

Here education can take place either in institutions like hospitals and welfare and care centers, or in family yards where meetings of neighbours can be held.

One of the main difficulties in urban or suburban areas is the ethnical heterogeneity of the population. Furthermore, it is obvious that the situation in slum areas with extended «families» living on the income of one or two of their members is very different from the situation in rural areas where food is more easily available.

2.3.2. *Rural communities*

The whole population of a village can be the target, for it is culturally more if not perfectly homogenous. Authors like PELTO are, however, of the opinion that the unit for the analysis of nutrition behavior must be the *family.*

2.3.3. *Large geographical or political areas*

In certain parts of the world, as is probably the case in Central or South America, nutritional habits may characterize large ethnic groups, while in other parts, as in sub-Saharian Africa, habits may in the extreme case be commanded by family-specific rules. In this latter case, there is a need for detailed nutritional atlases, similar to the regional linguistic atlases developed since the end of the 19th century.

When large areas can be meaningfully treated as a whole, an extensive use of the mass media can at least support direct educational interventions, if not replace them. When large populations are involved, corresponding evaluation programs must be developed. While the evaluation of attitudinal changes remains of great importance, *economic indicators* may help in identifying the evolution of nutritional habits.

2.3.4. *In hospitals*

A stay in hospital often corresponds to a crisis or to a critical event. A hospital is, of course, a specific setting with exceptional opportunities for dialogue and action.

2.3.4.1. *Cases of severe malnutrition*

Though affecting both children and adults, it is obvious that malnutrition is by far more critical with children. If the mother is present during the stay at the hospital and allowed to prepare her child's meals, feeding habits can be observed and discussed.

In areas where adequate nutritional elements are available, but not utilized, it becomes possible to find out whether this is caused by ignorance or commanded by general, local or even family taboos.

2.3.4.2. *Birth in hospital*

This is an opportunity to interview the mothers about the way they intend or feel compelled by tribal rules to feed, and to undertake adequate education taking into account the prevailing mores.

2.4. Experimental design

The topic of research designs will be specially treated by KLEIN. Let me just mention that, according to our experience, experimental or even quasi-experimental designs of some sophistication are not often applicable. Thus, we often produce soft data calling for careful replication. However, if some points of a nutritional program can be experimentally treated so that hard data can be immediately obtained, the opportunity should not be missed.

2.5. Instruments

The methodology of instrument development has now reached an advanced stage of sophistication[1] that can be illustrated by matrix sampling, generalizibility coefficients, latent trait models, criterion-referenced testing, tailored testing, etc.

However, beyond these technicalities, the great principles of test development remain valid:

- Careful definition of the objectives of evaluation and clear statement of relation between the objectives and a broader theory.
- Translation of the objectives into overt, observable behavior.
- Careful try-out of instruments.
- Control of reliability and possibly inter-rater reliability, especially in the case of observation schedules and rating scales. Calculation of standard error of measurement.
- Discussion of construct, content and, in certain cases, predictive validity.

2.5.1. *Knowledge*

2.5.1.1. *Direct observation*

Nutrition related-behavior can be assessed, first in a controlled setting (i.e. hospital) and later under normal life conditions.

This kind of evaluation is expensive (visits on the spot, trained and accepted personnel needed) and has only short-term validity. Later on, it may become difficult to establish the causal link between observed behavior and educational program.

2.5.1.2. *Non-verbal tests*

Individual or small group picture tests are here the common answer. Great care is needed for the design of such tests to make them culturally consistent and meaningful.

2.5.1.3. *Performance tests*

Here, the test items are identical to the behavior required in the actual nutritional performance. At this taxonomy level, the performance mostly

1 For further elaboration or detailed information, many publications are available:
GUILFORD, J.P., *Psychometric methods*, New York, McGraw-Hill, 1954.
THORNDIKE, R.L. and HAGEN, E., *Measurement and evaluation in psychology and education*, New York, Wiley, 1961.
DE LANDSHEERE, G., *Dictionnaire de l'évaluation et de la recherche en éducation*, Paris, P.U.F., 1969, 3e éd.

consists in the actual reproduction from memory of a single piece of behavior (i.e. filtering water) or of behavioral patterns or sets (i.e. preparing of food according to a learned recipe).

2.5.1.4. *Verbal tests.*

These come last in this presentation because in many instances this category of tests combines all the difficulties: not only the weaknesses inherent in all verbal tests (linguistic levels, levels of instruction, answers in terms of social desirability, etc.), but also the problems encountered in geographical areas with numerous local dialects.

2.5.2. *Skills*

The same type of assessment instruments as above can be employed to test skills.

In many severely underdeveloped areas or regions, it seems difficult to test at higher cognitive levels. Actual testable behavior is often limited to lower cognitive processes, i.e. comprehension and application. It is, however, difficult to make sure that this limitation is not due to communication difficulties.

2.5.3. *Attitudes*

It has been repeatedly demonstrated that attitude or opinion measurement with Thorndike- or Likert-type scales has a very limited predictive validity in terms of individual behavior. First, the attitude as commonly formulated tends to cover a rather wide range type of behavior and is for that reason rather abstract. Second, it is well known that in an authoritarian situation, the subject tries to answer in line with the interviewer's expectations.

Just as GREEN (1977, p. 160) concludes that «the evidence appears to indicate the need for highly targeted health messages addressed to very specific behaviors rather than more general classes of health behavior», behavior intentions evaluation should be preferred to attitudes assessment.

Behavioral intentions are specific, and recent techniques help to evaluate them with high predictive validity. Such an evaluation combines the main determinants of neo-behaviorism and dynamic psychology: attitude (mostly in terms of like or dislike); expected reward; ethnic or societal rules or norms governing individual behavior[2] (superego); final option of the subject (ego).[3] These four dimensions can be assessed on rating scales and combined for interpretation. Only individual interviews are likely to provide the information needed for such a (clinical) evaluation.

2 Or normative beliefs.
3 Or motivation to comply with the normative beliefs.

A concrete example (suggested by ANDRIEN) may further clarify this important point. Before and after trying to convince mothers to give eggs to their children, the following questions can be asked:

1. Do you think eggs are good food for your child? (Attitude)
2. What is going to happen if you give eggs to your child? (Expected reward)
3. At what age do children get eggs in your family? If mothers give eggs to their children before that time, what do the old people say? (Societal rules or norms)
4. Did you recently give eggs to your child? When? (Actual behavior)

2.6. *Validity*

GREEN (1977) has remarkably defined the dilemma of internal versus external validity[4]: the harder we strive for internal validity, the more we usually sacrifice external validity. This is pretty obvious though: unless hardened by numerous replications in various settings, a clinical, anthropological approach is not likely to yield the same results as nomothetic research.

The theory of generalizibility is of great help in clarifying this. It tells us that the generalizibility of conclusions depends on the extent to which these conclusions hold in all situations, with all possible subjects, with all possible test items pertaining to the domain, etc.

Is nutrition education – like other fields of education – sufficiently advanced to claim real external validity? I personally doubt it and think that the main efforts should concentrate on internal validity. Here, it is possible to accept that what works for some people does not work for all, that context variables have to be taken as they are. For instance in a hospital environment, the diversity of the target population can reduce the possibility of a common educational language to such extent that only individualized communication can work. But, at the same time, the lack of qualification and motivation of the nursing personnel can be so severe that a well conceived and implemented individual treatment is a myth. In most cases, one has to compromise and swing from a group instruction focused on essentials and exploiting all available communication techniques and psychological mecanisms, to more limited individual interaction and education, conditions permitting.

4 *Internal validity* is the degree to which we can say with certainty that the results observed after the program are attributable to the program or educational treatment.
External validity is the degree to which such results can be expected to recur in other places or at other times. This is sometimes called generalizibility.

References

GREEN, L.W.: Evaluation and measurement: some dilemmas for health education. Am. J. Public Health *67*, 155–161 (1977).

PELTO, G.H.: Anthropological contribution to nutrition education research. J. Nutr. Educ. *13*, 1, 2–8 (1981).

Discussion

LAMOTTE believes that, in certain ethnic groups, one of the main causes of malnutrition in infants and small children is the fact that, if the child refuses to eat, the mother will not insist, and the child really does go without. He wondered if it would be possible to design an instrument to measure the mother's determination to impose her will on the child in this particular situation. DE LANDSHEERE replied that the mothers LAMOTTE referred to were apparently following a societal rule which says that the mother should not try to force a child to eat if it does not want to. The question is to what extent the mother is going to follow that rule or to what extent she is ready to go against it. DE LANDSHEERE believes that an in-depth interview would be the best method of dealing with this problem.

Objectives of nutrition education should be realistic. Mothers should for instance not be told to purchase and prepare foods which are financially or otherwise inaccessible to them. If a mother is asked to do something impossible and later is asked questions about her behavior she may give the expected rather than the true answer. The tendency of people to give an answer not on the basis of what they really do and really feel but on the basis of what they think is expected of them is a well-known phenomenon. Psychologists call it social desirability. Assessments based on self-reports should always be cross-checked to see to what extent answers have been influenced by social desirability.

In clinical psychology one has experimented with many new methods to change people's behavior. To what extent have these also been used in nutrition education? An experiment with different reward systems was reported by GUTHRIE (Development Forum *9*, 3, 6–7, 1981). Mothers in three villages in the Philippines were encouraged to follow five rules: 1) continue breastfeeding; 2) supplement breastmilk with other food; 3) plant green leafy vegetables; 4) maintain weight gain of the child; 5) visit the health center once a month. In the first village mothers received «health coupons» each month for each of the five rules they had followed. At the beginning of the experiment these coupons were used as lottery tickets; later, on the women's recommendation, they were allowed to be traded in for food, soap or clothing. In the second village the mothers received a color photograph of themselves and their baby if the baby maintained his weight-for-age status for three months. In the third village, no reward system was offered, but nutrition education and medical services were available. Babies of mothers in the first two villages grew better than babies of mothers in the village where no rewards were offered. Both reward systems worked equally well. It would be

interesting to continue research along these lines and to experiment with other techniques of behavior modification.

In some regions, the limiting factor is food availability. Under these circumstances it is difficult to design a meaningful nutrition education program; here, all efforts have to be directed to increasing food production.

Another problem is that nutrition education messages are a function of the conditions which prevail in a certain geographical area at a certain time. These conditions may change and the objectives and messages of nutrition education then have to be adopted to the new situation. To the target population such changes may appear to reflect a lack of direction, consistency and continuity.

Several participants commented on DE LANDSHEERE's suggestion to develop a food atlas with maps on food production, food availability, food habits, etc., in different geographic areas. DEVADAS reported that the Indian Council of Medical Research had produced a Nutrition Atlas of India. Most participants agreed that it would be very desirable to have food or nutrition atlases for other parts of the world as well.

Validity of dietary survey methods: A critical approach

W.A. VAN STAVEREN and J. BUREMA

Summary

Numerous studies during the past 30 years have attempted to establish the validity of methods used to measure food intake. A review of these studies has revealed that concepts of validity vary and consequently criteria against which dietary survey methods have been evaluated also vary.

The validity of a method, that is the demonstration that a method measures what it is intended to measure, can only be assessed by comparing it with an independent method of indisputable accuracy. Such an absolute method does not exist because of the nature of the data to be collected. However, it may be possible to establish the relative validity by evaluating it in terms of another method which has general acceptance.

Evaluating nutrition education programmes in the Third World, two factors should be considered when selecting the dietary survey method to be used. Firstly, it should be determined whether information is requested about the group or the individual. Secondly, it should be determined whether quantitive data on intakes of nutrients are required, or whether it is sufficient to group individuals according to intake into broad categories of low, medium and high intake.

Key words: diet – dietary survey – nutrition – epidemiological methods – definition of terms.

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Introduction

In 1981, STUNKARD and WAXMAN in a review of the literature on the quality of dietary survey methods concluded that: «If self-reports (24-hour recalls) are as accurate as they seem, the policy implications are profound», while in the same year BAGHURST and BAGHURST (1981) also in a review of the literature concluded that: «With one or two exceptions, all other studies of 24-hour recalls have been shown to grossly underestimate actual intake, thus making the 24-hour recall not only unreliable for the measurement of individual intake, but also for group intake».