Promoting Growth and Development of Under Fives

Edited by

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FOREWORD

Malnutrition is still a very important problem today, which is in dire contrast with the general interest it receives as a priority theme for intervention as well as for research funding. Although in the past many efforts were made to alleviate this burden, not all have been as successful, which is an argument to reflect on a number of strategies. Then why organize a colloquium on growth and development?

A number of observations can justify this choice. First, growth monitoring which has for long been a cornerstone strategy to improve nutritional status of children is hotly debated. Discussions are held regarding its concept, technical and operational difficulties, whether it is a good solution to the problem and around possible alternatives.

Secondly one can query whether having focussed the objective on nutritional status and not on a more comprehensive concept such as growth and development, has been the reason for the relative failure of growth monitoring. A child is more than a weight increment and growth failure is the expression of a multicausal problem, with roots in direct, family and community causes. These are not separate, but strongly interlinked. So far interventions have predominantly focussed on food intake. On the other hand preventive activities are often directed towards one particular risk and performed by different health workers. Activities are separated in space and time. Improving and safeguarding an optimal nutritional status cannot be separated from other problems children face. Comprehensiveness is definitely called for.

Thirdly, many experiences exist but they remain in the peer review sphere. Researchers have researchers as peers and implementers have implementers as peer. Cross-fertilization is rare. In addition, solutions will have to be looked for in a multi-disciplinary approach. Both the analyses of the problem and of possible solutions should take place in a multidisciplinary forum.

The present colloquium was therefore organized to bring together different disciplines (anthropologists, health workers, psychologists, etc) and a mix of researchers, fund raisers, NGO’s and field workers. The aim is to come up with alternative strategies to promote growth and development that have benefited from a wide multidisciplinary input. Hopefully this meeting will be a turning point to revisit actual strategies, create new networks to test and implement a more comprehensive approach towards improving growth, nutrition and development of children with recognition of the limits poverty impose.
The colloquium comes also at a time when a large project: "Health sector reform: Towards a more global approach for improving child growth and development", Funded by the European Union under the INCO programme, and by Nutrition Tiers Monde is finalized. The colloquium could only take place thanks to the generous contribution of the European Union, the Flemish Ministry of Health, the Directorate General for Development Co-operation of Belgium, the Institut de Recherche pour le Développement, the City of Antwerp and the Fortis Bank. A gathering like this is only possible thanks to the contribution of many who organized logistics, travel, invitations, venue, technical support, the reviews and all the not very visible but necessary activities. To them our sincere thanks.
Introduction

In the present colloquium presentations and related discussions have constantly returned to growth monitoring when talking about strategies to improve growth and development of children. Growth monitoring has indeed, for years been one of the cornerstone interventions to improve nutritional status of young children and it is still largely promoted as one of the basic health delivery activities and in vertical programs. It appears that not all that many alternatives exist or that the use of growth monitoring is still hotly debated.

The presentations of Beghin and Latham give a good overview of the changing paradigms in promotion of growth and development over the years, where they stress the need to go beyond the objectives of growth monitoring as they are stated by WHO. Why then has it proven virtually impossible to adapt growth monitoring toward a broader concept of promoting growth and development? In many of the discussions, it was argued by some that they believe in growth monitoring and that it works even in no hard proof exists. Arguments have become more emotional and loaded with personal conviction. Although perhaps striking at first, there might be some proof in these emotional arguments. Many will agree that very much depends on the person or the organization that is running the programme and the presentation of Coulibaly also underlines this point. We could set aside these arguments by saying that there is no hard evidence to support the hypothesis that growth monitoring decreases malnutrition or has an effect on child survival. But this would be disregarding, to some extent, the limited number of controlled trials their limits. With their nature of control they overlook the intricate relationship between actors when dealing with community or people oriented interventions, which are of particular

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importance in a type of activity where much relies on the credibility of the provider. "No proven effect", cannot be interpreted as a failure of the conceptual basis of the intervention per se. It could also be a problem of implementation, acceptance, relation health worker parent, etc. Particular in relation to this last point, we find indeed that the majority of the arguments against growth monitoring are of a technical nature. The present synthesis therefore tries to look at growth promoting activities in a more comprehensive way with as particular objective the search for alternative solutions.

As a health related activity, growth monitoring knows three dimensions; need, demand and offer. Need is defined by experts analyzing a health problem and based on epidemiological criteria. The second dimension is the demand of the population for a particular health care service. The third dimension covers health-related activities, curative or preventive, offered to the population.

The three dimensions overlap and create seven possible situations. The ideal one is obviously that what is offered translates both a need and a demand. In the following section we will try to analyze growth monitoring using these facets with the underlying hypothesis that the relatively disappointing results observed are due to a weak overlap between offer, need and demand.

Growth and development promoting activities organized until now

*The need for growth promoting activities*

In the past the needs assessment has largely focussed on malnutrition, where wasting was the particular concern. The main focus has been growth monitoring.
This is defined by the WHO as a nutrition intervention that not only measures and charts weight of children, but uses the information on physical growth to counsel parents and motivate actions that improve growth (1). It is thus an approach to detect growth faltering in a child long before the very typical clinical picture of malnutrition becomes evident. The pattern of the curve should elucidate the physical state of a child for both health worker and parent so that corrective measures can be initiated preventing a child from becoming malnourished (2-4).

The reason for addressing malnutrition is the documented associations of increased risk of dying, a relationship related to the degree of malnutrition. The growth curve used together with regular weighing and plotting is thus in essence a screening tool to identify children not gaining weight properly or even loosing weight.

Malnutrition is without doubt an important problem, which seriously impairs growth and development of children (5,6). But how strong is the relationship with mortality, the final objective? Mortality is a multi-causal phenomenon in which malnutrition is but one factor. This explains the large variation in association documented in many studies on the relationship between malnutrition and mortality.

**What was offered for growth promotion?**

Here again the health system has limited offer of services for promoting growth and development to growth monitoring. When implemented, health workers privilege the technical aspects as the paper of Roberfroid demonstrates. The communication part is felt as the least important.

What is offered is for a large part a screening instrument. This, however, should respond to a number of characteristics (7).

The condition screened for should be important, which is certainly the case for malnutrition and its related mortality.

The early stages of the condition should be well understood. There is unfortunately, very little information on the significance of early stages of malnutrition in relation to developing more severe forms later. Although weight is a very sensitive indicator it is, unfortunately, not very specific. Weight fluctuates considerably over short time intervals. The condition is thus not easily interpreted. Even in the best of situations growth still tends to regress towards the mean. Small babies will catch up and large babies will catch down. Experience shows that one baby in 20 will cross 2 centile channels equivalent to 1.3 standard deviations (8). Add to this that stunting sets in very early in life with weight
following height trend, most children will be seen to have a growth curve that deviates progressively from the average weight curve.

Treatment at an early stage should be better than later. It is clear that severe malnutrition still entails a high case fatality rate (9). Although treating malnutrition early is definitely less hazardous, this does not mean that it is necessarily easier. The cornerstone of treatment of early forms of malnutrition is by informing the mother what she should feed the child. But as we know changing behaviour is a complex issue and information is only a small part of the pathway. Messages should be socially accepted in the family and community, the right decision maker should be targeted and mothers are often limited in changes they can introduce given their social position.

Although weighing is sensitive for changes, it does not identify correctly the children who are at risk. The weighing itself is often flawed with inaccuracies and technical mistakes.

Acceptability of weighing is also not always high. It is an important investment in time and resources for the parents and in certain situations considered harmful. Sometimes the cause of malnutrition is attributed to the weighing bag or a spiritual contamination via the weighing of a malnourished child to a healthy child. Mothers are also very concerned about the health of their children. A bad growth and development of a child is easily interpreted as a direct failure to be a good mother and therefore carries with it an important negative connotation. This negative aspect is often transferred from health worker to mother who scolds her for not looking after her child very well. Acceptability is in addition also very much determined by the degree by which an intervention responds to a demand. Parents do evaluate growth and development of their children but use other criteria than weight increments or the position on a curve as the presentations of Lefèvre, De Suremain and Bonnet suggest.

The correct interval between weighing sessions is not very clearly defined. Short intervals increase sensitivity but are more prone to influences of normal weight variations and measurement errors. Decisions are delayed for months because it is difficult to interpret short term variations. Long intervals lose in sensitivity and the lack of more detailed information makes decisions difficult.

Weighing is also a considerable investment in personnel. For a target population of 10000 people and weighing children six times in the first year of life and four times in the following years, a total of 8800 weighing sessions are needed. With an average of ten minutes per session, this represents a workload of 1466 effective hours or almost the equivalent of one full time.
Finally screening should be applied to all persons at risk and on a regular basis. With health service coverage, we know that health service utilization decreases when the distance is more than five kilometres. Many families live outside this perimeter. The evaluations of compliance to growth monitoring programmes also show that the weighing schedule is adhered to as long as the vaccination schedule is offered. Once vaccination is complete, very few return for weighing.

The accumulated evidence presented so far underlines the very weak basis for using growth monitoring as a screening tool. Weighing used as a preventive activity has sometimes also perverse effects. Weighing will not be performed anymore as part of curative activities and many malnourished cases will go undiagnosed. Indeed many children presenting with an illness will have a varying degree of malnutrition and therapeutically it is important to address both the disease and weight loss. An analysis of children participating in a nutrition rehabilitation program in Bolivia showed that the participants were six time more likely to have been identified in the curative consultation than through regular weighing.

The demand for growth promotion

The connection between body proportion and food is not directly made in many communities. Thinness is not a "disease" as such and therefore does not fit the concept of seeking cure in the medical model people have. People use different models and levels of causality to explain changes in health. Spirits, a weighing bag, the shadow of a woman who recently had an abortion and the like, all can transmit malnutrition (10,11).

When caretakers are asked about their expectations and perceptions on child growth and development, we find a consistent pattern across different societies. Parents evaluate their children in a global way. They should be sociable, have a general good appearance, not be a nuisance, and start walking and eating well. As Tonglet mentions, parents correctly appraised growth performance of their children when asked and this was more effective to identify correctly malnourished children than regular weighing.

Parents also expressed that they had a desire to be able to communicate about the development of their child with health workers but that they were seldom given this opportunity. The accent of the contact is the weighing and the plotting and not the overall performance of their child. They feel that the health worker is not interested in what they want. The growth pattern in terms of
weight curve profile, is something that does not enter in their toolbox of evaluations. It remains for them very much the domain of the health worker and his expertise.

It is therefore not surprising that both health workers and caretakers express a degree of frustration around growth monitoring. The parents feel they are not listened to, and treated badly because they do not understand very well what the discourse of the health worker is all about. The health worker from his side, feels disenchanted because parents seem to have little interest in the weighing, the curve, the information provided and in their willingness to change behaviour.

To abandon or redefine?

Need to broaden the scope

Health services have thus predominantly offered regular weighing to identify children who are gaining less weight than they should. The underlying assumption is that when growth is sub-optimal health education should be given to the parents. From the preceding parts it is obvious that GM performs badly as a screening tool, that what is offered does not really respond to the demand of caretakers, and that the need is broader than only weight increments as De Onis clearly suggests. What is offered in terms of advice also follows a linear paradigm between information and change of behaviour. The cause of malnutrition is distilled to a lack of information given to the mother. This unfortunately overlooks the broad environmental context of the causality of malnutrition. First malnutrition is rooted in poverty. There are often limits to what people can change in their diet. Information only frustrates parents who are very well aware of their daily struggle to provide enough food for their children as clearly demonstrated by Duffield. There are thus enough arguments to support a thesis to abandon growth monitoring altogether. But then we have been looking at one answer to a much broader problem or to put it differently; at the wrong answer to the wrongly identified problem.

Even if nutrition education has been performed in a linear fashion, it would be too simplistic to regard poverty and lack of information as the sole limiting factors in behaviour change. As the HEARTH model presented by Berggren shows, there are positive deviants in a community. These families are able to have healthy and well-nourished children although they have the same resources as families with malnourished children. The reason for this might lie in the fact that we have to a certain degree overlooked that
malnutrition of a child is a family problem. In many societies married couples live in an extended family where strict hierarchical rules apply. A mother cannot change what she gives to the child unless her husband or other members of the family approve it. In such setting it is often inappropriate that she should even propose a change in food habits. In other settings the decisions on what is spent on food and what is bought is the right of the husband. Given the serving role of women in many societies it would be highly inappropriate for her to suggest her husband to take other decision. But there is perhaps an even more profound reason for the reticence towards behavioural change. Proposing that something must change means that there is a problem, in this case a malnourished child. This would directly imply that the mother has failed to care for her child properly, and in her duties as wife and mother. Imagine the public blame and admission of failure.

If malnutrition is up to a certain degree a family issue it could also be regarded as an expression of dysfunction of the family. In a study of a nutrition rehabilitation program in Cochabamba city, Bolivia, it was found that the majority of malnourished children came from socially deprived families or families with familial tension (12). Bouville presents similar findings from an African community. In Europe a majority of failure to thrive children comes from broken homes, single parent families or where social fitting-in is less than optimal. Family tension, wives left by their husbands, living is tension with in-laws, neglect, illness or depression can all contribute to disinterest or capacity of the mother to care. These elements are not the sole property of developed countries but exist in developing countries as well, although not so well documented. Malnutrition is somewhere along the line always due to a deficient food intake, but the mechanisms responsible for this relationship are much more than poverty or a lack of information alone.

There is a demand for support in growth and development from the parents side and one can argue whether having as objective promotion of growth and development would also not address need better. Indeed, as the paper of Pelto underlines, the objective should be to promote and safeguard as much as possible the health potential of children, and this with an integrated approach. We know that children face certain risk during the first years of life. Some of them can be screened for others prevented through vaccination, others still need a communication with the parents on how to cover nutritional needs of the children or how to prevent accidents.

This needs assessment with critical periods can be translated in a schedule of contacts that are needed between family and health worker.
Screening for malnutrition should not be regarded a priority. For this GM is not very well suited. This is also the case for stunting. The pathologies related to stunting are so obvious that they will be diagnosed without using stunting as a prime clinical sign. As Hall presents in his paper, a single height measurement once around the age of five is sufficient to identify the two conditions that might have been late in diagnosing: Turner’s syndrome and isolated growth hormone deficiency. One aspect of screening, largely overlooked, is the ethical commitment to act upon the information at hand. In the case of stunting the causality is so complex and imbedded in socio-economic factors that health services will have very little impact on it with activities they can implement. The screening should definitely not be broadened to include height measurements.

Responding more to demand, broadening the scope and redefining the objective towards the promotion of growth and development also asks for other evaluation tools. As argued by Engle, we also need indicators to measure development. Following the analyses done in the UK and the poor specificity of development indicators to identify deviation from normal at the individual level, there seems to be no need to introduce individual indicators and active screening. There is a risk of falling in the same trap of screening for insufficient weight increase. Arguments to have indicators on a community level are however very strong. At present they do not exist however

What alternative to offer?

Although we should accept that growth and development is very much defined by socio economic conditions, this should not lead to a sense of defeatism. The reason for the failure of nutrition education must be sought in the failure to have addressed the complex interplay between food and family dynamics. Children with a sub optimal growth should be considered symptom carriers of a family tension. A solution would need to be found within this reference framework. A patient or child centred approach is what is called for because a multidimensional problem cannot be resolved with a standardized, unique procedure. But as mentioned in the papers of Bossyns and Criel, this would need to fit in a new attitude of health workers or community workers. Standardized protocols frustrate the creativity of health workers and simplify a complex family and community context. First parents know when something goes wrong with their children and they can be asked as Tonglet shows in his paper. An approach where health workers are
free to discuss matters with parents improves matters considerably according to the presentation of François.

This poses however, some serious challenges. Medical education and attitude should refocus on putting the patient central within his environment as opposed to the search for a diagnosis and a drug treatment.

Even with a child centred approach, with all the challenges this will bring, supportive mechanisms must be in place, which also includes counselling for social or psychological problems. A clear distinction must be made from the beginning on the specificity of health service and community approaches. Both should be complementary and preferably organized at the same time.

Health services must follow up children according to a schedule of risks children face during their development period and invest in making an individual diagnosis. Here we must accept though, that much more needs to be invested in understanding the demand side of the parents. The weighing, screening and nutrition education has dominated very the way research questions have been formulated

Parents and community can and should be directly involved in a programme to promote growth and development of their children, as presented in the papers of E. Sejas, Rubin de Celis and Pecho. First a booklet that explains better growth and development issues with practical tips on growth and development, including feeding and schedules where a contact is needed with the health services increases self-determination of parents and their confidence to interact with health workers. They become clients who are more aware of their rights. The community approach underlines the important role parents can play to improve the development of their children by discussing how their children develop, what their expectations are and how their children learn, and interact socially. Community programs should be directed towards promotional aspect and increasing self-determination. They should take the form of health clubs or mothers clubs, where issues on growth and development can be discussed. It is important that this aspect includes not only mothers but also members of the community who can have an effect on child growth and development.

Whenever an activity is initiated to identify problems that might have occurred, there is also an ethical need to propose solutions and offer services. When a child is identified with a problem an individual diagnosis has to be made involving the family. The diagnostic possibilities are diverse given the multifaceted nature of growth problems. The need for curative interventions has to be excluded first or when deemed necessary,
offered. Logical as it seems, this is where many things have gone wrong in the past. Making a diagnosis means having a clinical judgement capacity. An untrained health worker cannot do this. Unfortunately, untrained health workers or even community health workers are mostly in charge of growth monitoring. In addition, very few health services provide nutrition rehabilitation, have standardized guidelines or an active referral system despite the fact that with little input, a lot can be done at the first line (13). In hospital, children are treated for diseases, and it is left to the parents to feed the child. Very little of the recently published guidelines of WHO can be found implemented. It is sad to see in how many hospitals the basis of nutritional rehabilitation is still the high protein diet.

What then about the screening? Finding and helping malnourished children should remain a top priority of health services and health programs. The most efficient way, however, to find those children is to introduce weighing during curative services. The link between disease and nutritional status is so strong that these conditions often present together. Weighing and charting weight development provides important information but one has to accept that this is predominantly so for the health workers. A weight history provides additional information on the condition of a child and helps to make a correct diagnosis and define the course of action. The weight progress has little significance for the parents. Regular weighing can still help identify malnourished children but then when it is part of a larger conceptual program of promoting growth and development. The weighing is not the prime objective anymore.

Last but not least optimal growth and development should be considered a human right. Poverty alleviation and entitlement should receive priority investment. As much as possible and preferably always, the community, health system approach and poverty alleviation should be promoted together and not as a choice menu.

References


OVERVIEW OF HOW HEALTH SERVICES TACKLE PROMOTIONAL ACTIVITIES FOR GROWTH AND DEVELOPMENT

Ivan Beghin

Introduction

The question the organizers of the Colloquium asked me to deal with was: “How do health services tackle the promotion of growth and development?”

The answer, I am afraid, is “poorly”. Or, at least, that was true in the mid-nineties, as we shall see. After 40 years or more of growth monitoring all over the world, health services still don’t know for sure how to genuinely and effectively promote the healthy growth and development of young children, while in contrast they very well know how to immunize successfully, or to use oral therapy, or to promote family planning. The paradox is that growth monitoring is very old, even in developing countries!

In this brief overview I shall take a few highly selected historical moments, and draw on my personal experience, as I was explicitly invited to.

The early days

Growth monitoring seems to have a double origin. In the first place it clearly was an extension of the periodical weighing of children, which was practiced in the North since at least the beginning of last century. In the late 50’s, for example, when I arrived as a rural doctor in the Congo, weight monitoring was routinely practiced, and where available UNICEF dried skimmed milk was given for a few weeks to the children who didn’t thrive. Weights were noted down on an individual card, but no graph was used yet, and no promotion of growth was performed.

This brings us to the second origin: the need to screen malnourished children once a reasonable effective treatment had become available. In Haiti, for example, in the mid sixties, with Fougère and King we designed a growth chart based on Gomez classification of degrees of malnutrition, to select children for referral to nutritional rehabilitation centres (1). In Colombia, Rueda

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Williamson adapted a chart developed earlier by Tony, which combined weight and height. As the Director of National Institute of Nutrition, he actively promoted his “auxogramme” which, interestingly enough, was also used for counselling the child’s mother. Rueda’s chart did not spread out: it was too complicated, and experience showed that repeated measurements of height by low level health workers was time consuming and unreliable. Yet this chart was a pioneering tool in two aspects: its use for educating the mother, and its consideration of height.

Anyway, during all those years, in most health services in developing countries, growth monitoring was synonymous of “using growth charts”. There was little or no real promotion of growth, and no explicit interest in child development.

Progress during the seventies

Things started to change around 1970 and growth monitoring became more than just filling charts:

A number of field experiences were conducted, often by NGO’s, to take advantage of periodical contacts with the child and the mother, for providing preventive care, treatment when needed, and some amount of nutrition education. A few of these interventions succeeded in reducing mortality and improving nutrition, and have become famous: the “promotores” programme in Guatemala led by Jean-Pierre Habicht (2), the Jamkhed project (3,4), or the Narangwal experiment of Carl Taylor in India (5,6). Reviews of the lessons from such innovative attempts – at the time can be found in Sahn & Pestronk (7) or Beghin & Vanderveken (8).

A common feature of such experiments was that they were staffed with highly motivated personnel and endowed with substantial resources: they were therefore hard to replicate. Their main lesson, maybe, was to demonstrate the importance of comprehensiveness in approaching child health care.

A major contribution to growth promotion was that of David Morley in the early seventies, based on an extended experience in Nigeria. In the first place, in his “underfive clinics”, he was interested not only in growth, but also explicitly, in the child’s health. He also was one of the first to use the dynamics of growth to promote it (through counselling the mother and providing care). The evolution of the child weight was more of interest than his position in relation to a standard or to that of other children. The child had to follow his “Road to Health”. Health was the target! (9-14). Morley’s influence was considerable. Growth charts of all kinds (and colours) proliferated, reference data were passionately
discussed until a reasonably good agreement was reached under the auspices of WHO, and an international standard for universal use was adopted (15).

That same year (16) WHO and UNICEF called the Alma Ata Conference – a landmark in the history of public health. Nutrition was one of the eight priorities, and growth monitoring was explicitly recommended.

Yet the health services, in general, were not very responsive, for a number of reasons:

- Inadequate organization of care
- Poor training and supervision of first line health workers
- Lack of clear guidelines for such workers
- Difficulty of treating malnourished children and scarcity of places where to refer them for treatment.

The problem was aggravated by the “selective health care” controversy and its vertical approach (17), and by the promotion of GOBI by UNICEF (18,19). Growth monitoring, as the G in GOBI (the other components being oral rehydration, breastfeeding and immunization) was actually understood as growth promotion. But this interpretation was not applied in the routine of the health services. Using the chart remained mostly a ritual, serving basically as a tool for screening and diagnosis. Both selective health care and GOBI were the opposite of a comprehensive approach.

Anyhow, a positive aspect was that growth monitoring became a widespread practice, the world over.

A time of questioning

The late 80’s were a period of putting the practice of growth monitoring into question. A number of articles raised serious doubts. For example Gopalan & Chatterjee (20) and Gopalan (21), or various authors in a special supplement of the Indian Journal of Paediatrics (22), and foremost, Nancy Gerein in a by now classical paper, also in 1988 (23). Nancy Gerein was severely criticizing current growth monitoring practices, showing that their underlying assumptions were not sufficiently founded, and she was pointing to operational weaknesses which explained why growth monitoring couldn’t possibly meet the goal of improving growth and development. Pre-eminent issues of organization, planning, etc. were to be addressed first. Many of her criticisms and concerns are still valid today.

Yet, during approximately the same period, a few intervention studies were being conducted, such as the Iringa Project in
Tanzania, with UNICEF, or the Tamil Nadu Project in India, with the World Bank. They somehow repeated earlier projects, but they did so in the light of new concepts and experiences – which had been presented in quite a few original articles and reviews published in that period (24,25,26).

I am not going any further inside this more recent period, which no doubt is familiar to all of you, and I rather have a look at where we stand.

Lessons learned

What we have learned up to the mid-nineties, approximately, points in three directions that deserve to be further explored in the field:

1. The advantages of a comprehensive approach.

Comprehensiveness (in promoting growth and development) means:

- That the child is taken as a whole (his growth, his development and his health) and that the full range of preventive and curative care is provided, regardless of the category of problem the child is suffering or exposed to;
- That the child’s growth characteristics are seen in their context, which basically is the family – hence the importance of involving the parents and caretakers, of knowing their perceptions and representations, of supporting them, and of strengthening their caring capacity.

David Morley was already saying that in 1973!

2. The usefulness and feasibility of participation.

Participation, as understood here, means much more than the mere involvement of the parents or the community in detecting growth faltering (or obesity) in the child, and then calling upon the health service. It implies what Dixon (27) called the “devolvement” of health knowledge and skills from the health personnel towards the community. More deeply, it reflects a philosophical attitude of trusting the parents’ capacity and it turns away from the too common elitist attitude of the health workers – itself inherited from the doctors. Participation is therefore not only a means, but it is a goal in itself, contributing to the new development ethics of local democracy and self-determination or “empowerment” (28,29).

These are not just theoretical assertions: in the first place participation is feasible (30,31). Secondly those projects where
child mortality was reduced and/or nutrition improved as a consequence of the intervention, had either a comprehensive approach to child health and development, or active participation or both. Some of these projects were mentioned above: what is said here may be their major contribution to our present knowledge.

Yet, for participation to be effective in contributing to better growth and health, parents and community need to be motivated and to learn certain skills. This is where social communication enters

3. The third direction is the potential – insufficiently explored in this area – of social communication.

Any promotional activity, in the field of public health, requires a strong educational component. Nutrition education – in this case education for growth and development – seems to have received little attention from the Colloquium organizers, and maybe we should regret it. The reason, perhaps, is that nutrition education has been, and too often still is, rather ineffective. Yet, new approaches were being developed during the last decade or so, in which conventional nutrition education gives way to the management of social communication (32).

Social communication, as defined by Andrien, is “a set of communication activities (conscious or not) between the members of a given society, which reflect the codes and rules within this society. Such codes and rules are not only powerful determinants of individual behaviour. They also determine that individuals belong to the group, and play a key role in society’s cohesion. To intervene in social communication means therefore to change such codes and rules, and change individual behaviours at the population’s scale.” Nutrition education then is more an intervention integrated into pre-existing social communication, than an external intervention using its own channels and networks. This in turn requires a thorough understanding of values, attitudes and perceptions of the people (This last point, fortunately, is indeed well taken by the Colloquium!).

The overall issue, then, for the health services, is to organize and manage such social communication, as Andrien and I were showing in our book (32).

Recent applications of the social communication approach by Andrien and his co-workers from Liège University, and by the Academy of Educational Development in Washington, in areas such as family planning, AIDS prevention, nutrition, etc., strongly suggest that it can be successfully applied to the promotion of growth and development
• To create or strengthen awareness,
• To improve the caring capacity and the self-confidence of the parents,
• More generally, to empower them.

Two personal remarks

Besides the three lessons learned from recent experience, it seems to me that two issues need considerably more consideration. One is an old problem: that of longitudinal growth. Years ago, John Waterlow already insisted on the importance of measuring height (33,34). The second is the emergence of obesity world-wide, and of concern to us here: obesity in the young child.

The implications of these two points for the health services’ operations need to be debated and more probably be the topic of future research.

Conclusion

As a result of this overview, I would put seven questions related to the health services on my personal agenda:

1. Is growth monitoring important? Indeed, in too many places, even today, it remains a ritual, and the information it provides is not, or poorly used for the real promotion of growth and development, or the detection and management of child obesity. If it is important, why? What should we be measuring: weight? height? both?

   In spite of earlier work by Rueda-Williamson or Waterlow, we still tend to focus on weight and overlook longitudinal growth.

2. How should the health services approach the individual child comprehensively? What are the operational implications of the requisite of comprehensiveness?

3. What should the health services do to stimulate genuine participation and make it real, useful and liberating?

4. Is the management of social communication, understood as a dynamic, participatory process, a better answer than conventional nutrition education for empowering the parents and strengthening their caring capacity?

5. Hasn’t the time come to early detect – and prevent – child overweight and obesity?

   Obesity – when we think of its long-term consequences – is now a major problem in an increasing number of countries.
6. What is child development? How do the different actors perceive it? What does that mean for the health services’ operations?

7. How do we reach all (or almost all) the children in a community or district?

This essential issue of coverage is necessarily dependent from the existing health system, and raises questions of organization (as Nancy Gerein already showed in 1988).

Answering such questions should allow the health services to count on satisfactory guidelines for the promotion of growth and development, and would assist them in reaching the goal of good health practically, effectively, at an affordable cost, in a sustainable manner – in a wide variety of situations. Most of those questions are operational, and since the mid-nineties they have been the subject of good quality research and experimentation. Quite a few of these researchers are participating in this Symposium. This is why this meeting is relevant and timely. The Colloquium’s programme suggests that from our discussions a few answers might well emerge. New questions certainly will! And facing new questions is making progress indeed.

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References


Defining child development

Child development refers to the ordered emergence of increasingly complex abilities of thinking, communicating, moving, feeling and relating to others. For example, we know that with increasing age, children are able to recognize that other people have different ideas from theirs; the child has to develop a theory of what a mind is. As with growth, although we may characterize children according to their status at one point in time, we are searching for measures that reflect the velocity and rate of change, and the dimension in which the change occurs. Change occurs in many dimensions of development, such as language, cognition, emotion, and social competence. For each dimension the pattern of emergence may differ, so that progress in one domain may be more rapid than in another for periods of time. Timing may differ from child to child but the sequence of emergence of abilities within a dimension is fixed.

Recently the term “integrated child development” has been introduced to incorporate physical growth, health, and biobehavioural development as factors that influence individual competence. These behavioural factors include cognitive skills, temperament/personality, motivation, self-perceptions, and interpersonal style. The term “integrated” suggests that a child develops holistically; the links between physical growth and psychosocial development are complex but interlinked. A child who is poorly nourished or chronically ill is less likely to have the energy or interest to explore and learn. A healthy and well-nourished child in a stimulating environment will be more likely to profit from the experiences for learning.

Black (1) defines child development as “the adaptational processes that occur as children acquire increasingly complex skills and are socialized into the roles, rights, and responsibilities of society. The most rapid period of development is the first three years of life, as children acquire skills across multiple areas”. The acquisition of skills in fine motor development illustrates the process. New-borns have a grasp reflex, but lack functional eye-
hand co-ordination. During the first year of life children gain increasing control over their hands, such that by approximately 12 months of age, many children can pick up small objects and begin to feed themselves with their hands. By three years of age, children can feed themselves independently with utensils and can draw simple shapes.

The stages of emotional development are less well known. At birth children's expressions of emotions are limited to cries. Through interactions with caregivers, children's understanding and expressions of emotions become differentiated. By three years of age, most children are able to interpret and express a range of emotions in themselves and others, including happiness, anger, hunger, and distress. Similar patterns can be defined for social development, referring to the relationship of child to others, cognitive development, language, and perceptual development.

These abilities emerge in a constant interaction with the environment; indeed, at least 50% of the variance in child abilities can be attributed to environmental factors. Black (1) describes the process as a transaction in that the development of the child is influenced by environmental factors (e.g., warm and supportive relationships resulting in a more self-confident child) and in turn these child characteristics affect the environmental conditions (a confident child will explore more and try out more actions, resulting in higher confidence). A negative cycle can also occur; a malnourished child is less responsive to care, receives less attention, feeding and food, and in turn becomes more malnourished. An environmental intervention, such as someone patiently encouraging an anorexic child to eat, can break the negative cycle of decline.

Principles of the developmental process

What have we learned about the process of child development? Over the past 50 years, research primarily in industrialized countries has led to some important generalizations:

- A child's bio-behavioural development is function of the interaction of genetic influences and experiences, and is influenced by biological factors such as nutritional status and health status.
- The most rapid rate of development occurs in the first few years of life, and during this period, children are most vulnerable to risks in their physical and social environment.
- There are several ways in which risks in the first few years of life will affect later development. Research shows that early
positive experiences help to protect the child in later stressful events, increasing resilience. Early negative experiences may leave the individual more prone to later stressers or less able to profit from positive experiences. Investigators have also identified examples of “steeling” in which early negative experiences followed by family support can make an individual more able to resist later negative events.

- **Protective Factors:**
  - A close relationship with one or more caregivers in the first year of life (secure base phenomenon); these children are more likely to be confident and competent in later life.
  - A close relationship during early childhood; fathers can have significant positive impacts on children.
  - Caregivers who are both nurturing and directive (i.e., are clear in their expectations, listen to their children and provide information in a nurturing manner with warmth and respect); their children are usually confident and competent. These children receive clear guidance, they know the consequences of following or not following the expectations, and they feel warmth and respect from their caregivers (1).

- **Verbal interactions with adults, particularly in the second and third years of life, appear to be a crucial antecedent of early language development. Better language skills are related to better school performance.**

- **Early interventions have the potential to alter poor children’s achievement – they have larger effects in the short term than other kinds of human services. The earlier the intervention, the more effective – but if the child returns to an impoverished, not stimulating environment with an unresponsive caregiver, the gains will not be sustained (2). This improvement appears to be due in part to children’s acquisition of social skills.**

- **Both social and cognitive development is important for child’s later development – but we know much less about social and emotional development.**

- **Children develop in a cultural context and it plays a major role in how the child develops.**

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Child development in cultural context

Although the findings above are presumed to be generic, the last point underscores the need for examining cultural differences in childrearing practices and beliefs. It must be recognized, however, that culture is not static; it is a constantly changing set of beliefs and meanings that have varying effects on behaviour. It is generally accepted that cultural differences in the way communities think of children, their goals for children, and the opportunities that they provide for learning and for becoming part of a community result in very different forms of development.

In societies that value early motor precocity, as in parts of East Africa, children sit and stand far earlier than children in other parts of the world. Are these differences genetic or a result of parental teaching and interaction designed to support a particular goal? How robust are these differences compared to the remarkable similarities in all cultures in the course of development, such as the emergence of the social smile at six weeks, awareness of the sense of self around 18 months, and development of syntactic structures by 2 years of age? This issue is particularly pertinent when we consider the possibility of developing measurements of child development that would have validity across cultures.

The key issue is whether there must be different kinds of assessments for each culture, or whether there is some possibility of a generic measure for global advocacy, in addition to local and national measures. There are some suggestions that goals for children can generalize across cultures. For example, following a careful qualitative study in four rural villages of Nepal, Arnold concluded that despite the circumstances, children must “grow up healthy, well-nourished, protected from harm, with a sense of self-worth and identity, and enthusiasm and opportunities for learning; and that they learn to think for themselves, communicate effectively, get on with others, and play an active role in their families” (3 p. 36). She suggests that all children have rights to these conditions of development, not that there are cultural differences that proscribe certain children to one set of goals as opposed to another.

On the other hand, others argue persuasively that cultures will differ in the kinds of abilities and skills that they support, and their values for children. In India, for example, Viruru (4) suggests that Indian assumptions about childhood differ significantly from Western notions, leading to different outcomes for children. The Western theory sees the child as a logical thinker and learner, as a budding scientist actively pursing learning. Recommendations are
for “developmentally appropriate practice”, since the child has different ways of thinking at different ages; and learning occurs through experimentation and play. The recommended “Western” method of discipline, she argues, is that the child is taught to master herself, to learn through repeated experiences to control herself.

On the other hand Viruru sees the Indian child learning in a different way – the child must master complexity and ambiguity in her social sphere; learning occurs by repeated action, through songs and stories. Discipline is administered by threatening child with being separated from the greater whole, the ultimate loss. The child is assumed to be a creation of parents and gift from God – both human and divine, and born with fixed and unalterable propensities, although the child’s initial nature can be transformed by rituals. The child is part of the family collective space – not necessarily “brought up” but “lived with”. Social relationships are defined by high tolerance of ambiguity; Viruru comments that “ambiguity is crucial to all kinds of understanding between human beings” and adds “probably one of the reasons that so much in Indian culture seems ambiguous is the refusal to put things into words. Words are for the unimportant things in life”. Abstract rules are not described, and there is little explicit praise for children. Gender, however, determines all phases of the socialization process.

Can the same assessment tool be used for these two contexts, in which achievement is measured by different behaviours – social sophistication and ability to read social cues in one, and manipulative cognitive thinking in another? How much do these differences reflect social class differences, and variations within a culture?

One approach to define a child’s abilities is in terms of the child’s competence in a particular eco-cultural setting (e.g., rural agricultural, small trading, large urban area, etc.). Wachs (5) has defined development in terms of the child’s growing competence. He defines competence in terms of “one who can effectively adapt to and interact with his or her environment – or the ability to meet major developmental goals viewed as appropriate for a given individual at a given age in a given context, as well as coping with environmental challenges” (5). This definition would result in an infinite number of definitions of competence, which would be theoretically sound but practically not very useful. This definition acknowledges the need to learn to adapt to conditions of rapid change, such as urbanization, in which new competencies may be required during the course of growing up.

Another approach is to examine patterns of childrearing according to the goals parents have for their children, determined
by their livelihood systems. For example, Levine et al. (6) postulate that parents’ livelihood strategies have a significant effect on their child rearing practices. Parents have different investment strategies for their children, depending on the child’s role in livelihood. In rural, agricultural communities, parents may value child obedience and loyalty; parents want many children to survive, but once survival seems ensured, children become part of the “culture of children” and have relatively little interaction with parents. They may play a significant role in livelihood production and become important family members.

On the other hand, parents who perceive that the success of their children will be related to schooling and consequent employment have a different set of investment strategies; they may tend to have fewer children, investing in each more heavily, and value ability to learn more than obedience. These parents might tend to spend more time with their children in the second and third years of life, contributing to higher levels of language acquisition, whereas the first group of parents invested most heavily during on the earliest period of infancy to ensure survival. Children raised under each of these circumstances will develop slightly different sets of skills and abilities; the former could excel in procedural skills, learning how to do things by careful observation and memory, whereas the second might have more developed language and logical thinking skills. Which is more valuable depends on the kinds of demands that the culture has for children.

These arguments suggest that although culture is an extremely important dimension of childrearing, it must be seen as dynamic and changing. Parental values of childrearing depend on the economic and social conditions of the family. Many cultural groups, particularly in agrarian societies, value obedience and loyalty, and respect, and expect children to learn through the non-verbal observation of adults. For example, in a “value of children” study in 9 countries in the 1980s, “obeying their parents” was the most valued characteristic in four countries (Indonesia, Philippines, Thailand and Turkey (60%), while “being independent and self-reliant” was chosen by only 18% in Turkey (7 p. 42). However, as expectations for child performance change, with urbanization and universal schooling, these values may change as well, and the implications for what one is to measure will also change.
Global indicators of child development: What might be the advantages?

The section above clearly indicates the difficulties in defining child development in a global context, and emphasizes the importance of respect for local norms, values, and customs of childrearing. However, there are two major changes in the past decade that would suggest the possibility for developing some form of global indicator. The first is the global acceptance of a rights-based approach to children. The second is the rise of universal schooling in many countries, which might suggest that all children need similar skills for school success.

The Convention for the Rights of the Child prepared in 1990 is now ratified by 192 countries (all but 2). According to the CRC, every child has the right to develop “to the maximum extent possible”. Article 6 supports the child’s inherent right to life, and states parties shall ensure to the maximum extent possible the survival and development of the child. Further clarification of this item appears in the guidelines for periodic reporting. States (countries) must describe measures taken to “create an environment conducive to ensuring to the maximum extent possible the survival and development of the child, including physical, mental, spiritual, moral, psychological, and social development in a manner compatible with human dignity, and to prepare the child for an individual life in free society.”

Other articles also speak about rights related to a child’s development, and to the obligations of countries to support families to ensure these rights. Articles 5 and 18 enjoin States Parties to respect the responsibilities, rights and duties of parents to provide, in a manner consistent with the evolving capacities of the child, appropriate guidance to the child in exercising his rights as established in the Convention (8). Article 18 makes both parents responsible, and requires States Parties to render appropriate assistance to parents and legal guardians in performing childrearing duties and shall ensure the development of institutions, facilities and services for care of children, making specific mention of working parents’ needs for child care. Article 27 enjoins States parties to recognize the right of every child to a standard of living adequate for the child’s physical, mental, spiritual, moral and social development”. These statements guarantee the rights of all children, not just ones from rich countries, to optimal development.

Based on the CRC a series of 25 goals were established, and the past decade has seen the countries of the world rally around
these goals. With reports on the mid-decade goals and a final “End-Decade Report” in 2001. Setting these goals and holding countries accountable for their achievement focuses attention and investment to achieve the goals. Yet in these goals, there is no indicator of the child’s development. Initially only one of 25 goals referred to development: “to increase early child development activities, inducing appropriate low-cost interventions based in the family and the community”. However, when the list of goals was reorganized into seven Principal Goals for the World Plan of Action, no specific goal for child development was mentioned. The key measures included under 5 mortality, maternal mortality, child malnutrition, and micronutrient malnutrition. During the decade, relatively little investment went into improvement of early childhood development, compared to health and nutrition.

Was this because there were no globally accepted measures? Perhaps so; Myers (9) argues that “this failure (to have child development as part of the debate on improving human development or of monitoring the developmental progress of nations) is related at least in part to the failure to agree upon appropriate measures of what constitutes early childhood care and development” (p. 25). Similarly, as De los Angeles-Bautista (8) comments, “it is imperative that we monitor national plans of action and implementation targets to make sure young children do not disappear (p. 10).

A second argument for global indicators of child development is the increasing demand for universal schooling. This right, also enshrined in the CRC, has changed the kinds of demands on children. Although access to school has been the major goal in the past, the new Millennium Development Goals are calling for primary school completion to be the key outcome indicator. This change represents a new focus not only on access, but also on persistence and by inference, on school achievement.

Is school culturally determined, so that children require different kinds of preparation depending on the cultural context? Many cultures traditionally had models of schooling in which children learned from a non-parent, but the content of learning may have been the ways of doing things – procedural learning, rather than abstract learning. However, most schools now teach reading and mathematics, which require cognitive-linguistic intelligence and ability to handle abstractions. In many schools, memory (often primarily auditory memory) is the cognitive skill most related to achievement (10). Yet even when schooling is based on rote learning and memory, there may be benefits from school learning as opposed to learning “how to do things” outside school. For example, one recent assessment of the mathematics skills of non-
schooled street vendors in Brazil suggested that even though they were adept at arithmetic, they did not learn the abstractions necessary to understand mathematical systems which schooled children from similar backgrounds did (7). Schooling also develops similar social skills globally – they learn to adopt a learner role and have contact with non-family members (strangers), both other children and adults.

Turkish author Kagıtçibasi (7) rejected the idea that schools should vary by the culture and economic circumstances. She argues that by “not using comparative standards and not passing judgements (making value judgements) about the state of the children in the pre-industrial society, ironically, a value judgement is being made by default. This value judgement states that in the industrial society with mass schooling (universal), cognitive standards of achievement apply, but in pre-industrial societies they do not. What we have here is relativism leading to double standards “(p. 109).

Increasingly for children to benefit from globalization and urbanization they will need to learn to adapt to new situations, a skill which has not been addressed in schools to this time. In many parts of the world, globalization has resulted in increased income discrepancies, resulting to greater impoverishment of the poor (11). Yet world leaders do not argue for an end to globalization, but a greater openness to it (11) and an increased investment in human development.

Thus there are two reasons that we may need a global indicator of child development: preparing children for universal schooling and fulfilling children’s rights. How can countries be encouraged to invest in preparing children for school success, rather than only focusing changing schools to ensure access? If we had an indicator such as “% children below normal development for 3 years of age” across the countries, then countries could evaluate how they stand compared to others, and track the quality of the environment that is being provided to children. They could evaluate expenditures and make decisions about the value of greater investment in terms of effects on child development. They could also link improvements in health and nutrition to improvements in child development.

The barriers to having such an indicator are formidable, including how to define an indicator that is applicable across countries, how to respect local differences in child development, deciding how and who will be able to assess this information and how it should be used.

Experiences from the field of nutrition provide relevant lessons. The significance of malnutrition was first recognized in its
most “florid” forms – blindness due to vitamin A deficiency, scurvy from vitamin C deficiency, kwashakior from protein deficiency, and the severe wasting associated with the combined protein-energy deficiency. About 40 years ago there was a growing recognition that mild and moderate malnutrition might also have negative impacts on growth and development. But how should this be assessed? Initially a large number of measures of the body were taken – height, weight, head circumference, mid-arm circumference, knee to heel ratio, etc. After several decades of research, it is commonly accepted that height and weight are the best indicators – and height is in fact the most sensitive indicator of possible cognitive consequences for children.

Similarly, the measurements had to be normed - had to be compared to some yardstick so those children in one area could be compared to another. In the absence of other global alternatives, the normative data chosen were those from the largest database of growth data, that collected in the United States (National Center for Health Statistics). But many countries continued to use norms from their own countries. A strong challenge to universal norms was launched by Seckler in 1989 (12), who argued that norms must be based on national reference groups, rather than on an international standard. He argued in an article “Small but healthy” that if one used national norms, the rate of malnutrition would decline; in India, rather than having 60% of children malnourished, the percent would drop to a mere 10%.

A storm of protest silenced this argument. The protesters argued that in any population, the well-off group grew to approximately the same height as the US norm. Further, studies on the effects of malnutrition on mental development were showing that even mild malnutrition had negative effects on a child’s cognitive development. Thus the idea that there should be international standards was gradually accepted. The argument has a final phase; at this time, WHO and UNICEF and other partners are assessing the growth of well-nourished populations in six countries to establish internationally acceptable norms of growth. But the development of this consensus was a long slow process, with investment by many actors to arrive at the conclusion.

Other measures have also required intensive effort to define. Assessing breastfeeding, which from the outside seems to be straightforward, has been the subject of debate and controversy for a number of years. Could a similar process be envisioned for child development?
Global indicators of child development: What might be the drawbacks?

As noted above, a major difficulty in defining a global standard is that it defines the achievement of all children in terms of one standard. Values for a child’s development differ by culture, which can be at national, class, caste, or local level. Thus it is difficult to have a universal definition of child development since we must accept and preserve differences in cultural definitions of early child development" (13 p. 25).

A second problem is to decide which skills are to be measured. The age of the child at assessment will determine what is assessed; prior to age one, both motor and cognitive functions tend to be assessed. Before three, language and cognitive skills are emerging, but until 2 years of age they are not generally very predictive of later development. By age 3, verbal and cognitive skills are fairly well developed, so a more consistent set of measures can be assessed. Pre-reading and pre-writing skills can be assessed in a child at 4 or 5, but these tend not to emerge earlier.

Assessing young children requires a highly skilled tester in order to be sure that the child is showing what he or she really understands. Many investigations therefore rely on parent report, which tend to be somewhat unreliable, and may differ according to the parents’ own understanding of the questions asked, or their observational skills.

What kinds of norms should be used – global, national, or local – is a problem with child development as it had been with anthropometry (measures of growth). Finally, and most important, if the testing is not done well, or the testing instrument is flawed, the danger of mis-diagnosing and miss-classifying children must be of paramount concern.

Different kinds of assessments serve different purposes

In order to simplify the situation, we need to recognize that a global assessment of child development may not need the same kind of rigor as individual-level assessments of children. We need a number of different kinds of assessments, most of which do not need international standards. Nor do they all measure cognitive development; for each purpose, indicators of social and emotional development could be recommended. Examining these multiple uses may help understand the very limited role a global assessment might have.
Three main purposes of assessment can be defined.

Individual level assessments must be made very accurately in order to assure appropriate interventions for children. They have to include assessment of enough dimensions, and with enough different items, to be sure that the assessment is reliable and valid for that particular child. Uses of these indicators might be:

- Screening tools for assessing which children are at risk of disabilities or delays
- Individual child assessment for educational and therapeutic interventions – clinical assessments
- Assessments of children’s readiness for school, an “achievement” test;

A second group of assessments are those designed to compare children within a particular social context – either for research purposes – identifying factors associated with child development improvement, evaluating interventions, or for programme evaluations – to assess what works under which conditions, and with which kinds of children. In this case, the measures can be developed according to the particular goals of the programme and the local context, and need not be comparable across cultures. This assessment may or may not require individual-level reliability.

The third kind of assessment is to evaluate achievement of internationally defined goals and objectives. These need not be individual-level measures, but must reflect at a population level both the capacities of children and the broader context of care. Thus it may be possible to evaluate a larger number of children on fewer skills, which will provide a population level measure but could not be used to diagnose or classify a particular child. Parental report might prove more valuable for this effort, if questions can be devised to assess what they are observing about their children.

Approaches that have been followed for the development of measures of child development include the following, which may meet one or more of the three goals above:

Adapt a western-developed scale: In this case, a well-developed scale from industrialized countries is adapted to the cultural context through changing language, items that are culturally biased, the kinds of responses that might be expected, the testing situation, and finally the norms to be used as a standard.

This is commonly followed strategy research and evaluation, and often for individual assessments, since they are harder to develop at the local level. For example, for infants, the Bayley Scales
of Infant Development are widely used, but they are difficult to use on a large scale, requiring careful training of the tester and a 1-hour assessment per infant.

**Develop a culture-specific scale that is normed within the culture and assesses learning valued in that culture.** In Latin America, a number of screening tests have been developed that are used for screening and for assessment. In Kenya the African Child Intelligence Test was developed. These measures can be used to meet the first two purposes.

**Developing a scale that is designed to assess a specific outcome or criterion.** A number of countries have tried to develop tests that would predict how well a child will do in school (specific outcome) before school entry. These measures are within country assessments, and can prove very useful for well-defined purposes, as they assess what will be related to an outcome. Unfortunately there are few of these for younger children, since establishing the link to education takes more time, but is not impossible.

**Dynamic measures: Measure learning rather than achievement.** A number of researchers have suggested that the best measure of a child’s IQ is her ability to learn in the course of doing a task. In other words, the child is given a problem to solve, and how well (and perhaps how quickly) the child solves the problem is the indicator of the child’s potential ability. This concept is appealing, but much work needs to be done to be sure that the particular task and learning requirements are culturally appropriate for the child.

**Develop country-specific norms for milestones of development.** This approach began as an effort to create a country-specific screening test. The idea is to assess norms for each country of common childhood “milestones” (e.g., sitting, standing, reaching for an object, naming four objects) and to develop locally appropriate milestones that reflect valued achievements in that culture. In the 1980s a large-scale project to develop these norms was undertaken by WHO in three countries. All countries assessed the age at which children could do a set of core indicators, based primarily on the items in the frequently used Denver Developmental Screening Test, and countries could develop unique indicators. The plan was to use these country-specific norms for constructing screening tests that would later be used along with growth cards for universal screening for disabilities that would include both universal and national items.

Testing of large-scale samples was done in three countries: India, Thailand, and China. Passing rates for individual items were generally consistent in the three countries, and rural-urban differences began to appear around 18 months (with language items
in particular). Some items differed widely among countries, such as age of drinking from a cup, but that difference may reflect the difficulty in being sure that the same behaviour is being assessed in each place (e.g., does the cup have a handle? Does the child have to hold with two hands, or with a handle, which is much more difficult?).

Currently, a similar effort is underway by WHO, but on a more limited scale. In 5 countries, the age at which well-nourished middle class children achieve 6 motor milestones is being assessed. This exercise was proposed for other milestones, but this was deemed too ambitious for the moment. It will provide the basis for creating some universal norms at least for these motor indicators.

If this approach were generalized to a larger number of indicators, one could envisage a measure that would assess the percent of children who pass a certain milestone at a defined age (or pass 4 to 5 indicators). This would provide a population measure of child development without having to label any particular child, and would allow comparisons between countries. It is possible that each country could define those indicators most appropriate for them based on norms from healthy and well nourished populations in their own countries, and then be able to assess percent of children passing these norms.

Assessments of policies, services, and the learning environment: Finally, some investigators have suggested that rather than measuring the child, one can assess the conditions for the child – coverage of services, policies, etc. The EFA assessment (UNICEF/UNESCO 1997) recommends two main indicators: % children of any age (or 3-5) in organized preschool; % children entering first grade who have some experience in preschool. Myers (13) suggests that these are unsatisfactory because there is no consistency in the definition of the terms, and the figures are often not well reported.

The Consultative Group for Early Childhood Care and Development/UNICEF approach tried to assess a minimum set of indicators for early childhood development at the national level. They worked with five countries and finally developed a list of 16 indicators plus an evaluative standard for assessment. These include:

- Coverage, access, and use – both pre-school enrolment and parent education programmes
- Programme quality – child/teacher ratio, teacher qualification, physical environment, curriculum or assessment of class interaction
- Political will – policy and financing
• Cost/expenditure
• Effects on children
  ➢ child developmental assessment
  ➢ school readiness – cognitive and social skills as well
  ➢ nutritional status
  ➢ health status
  ➢ parental knowledge and expectations

For any organization that wishes to improve the development of children at a global level, and give them the best possible start in life, informing key decision-makers about their country’s progress and how they compare to other countries is a key advocacy strategy. For this reason, having some form of indicator would be of great value. But it is a goal that remains elusive. Currently in UNICEF a new medium-term strategy has been developed, integrating health, nutrition, water and sanitation, protection and early learning. This initiative will be evaluated on the basis of:
• success in putting integrated child development policies in place,
• defining nationally agreed upon indicators of psychosocial and cognitive development based on local research in at least 6 countries, and
• Improving parenting care practices in a number of areas, including psychosocial care, feeding, care for the child with diarrhoea, and handwashing.

Conclusion

The development of internationally agreed on standards and scales for assessing child development is a significant challenge, but one that could have a substantial effect on international policies. The benefits would be seen in countries’ ability to monitor their progress in their national plans of action, to compare their results with other countries, to determine the effects of investment in early childhood, and to increase the priority given to early childhood development at a global scale. “You measure what you treasure.” At this point there are efforts to define indicators that can be agreed upon at least nationally, and eventually there may be international standards. We need to include measurement of policies, services, and care practices and environment, in addition to assessments of the child.

We also need to distinguish to purpose of the indicator, so that the approach to assessment will be most appropriate for the purpose. The best approach for an international indicator may be to define a set of core indicators or milestones, and calculate the
percent of children who have achieved them by a certain age – rather than defining a test score for each child. The milestones to be used could vary from country to country. Eventually the relation of these measures to key economic indicators, such as productivity of the population or school completion would be key criteria for continuation.

References

MALNUTRITION: A SUBJECT-MATTER FOR ANTHROPOLOGY?

Dorris Bonnet

I want to thank the symposium organizers, especially Professor Kolsteren for his invitation to this event. This symposium proves a real will for a global understanding of the medical care of children suffering from malnutrition in developing countries.

The programme of these three days shows that malnutrition is part of a reflexion on the growth and development of children as a whole.

This point of view is most appropriate to reach the operational aims and elaborate advice that can take into account the constraints as well as the different contexts, we are all working on.

My experience is Africanist and let me shortly introduce myself. I’m an anthropologist. I have been working for many years in Burkina Faso, since nineteen seventy-five as a student and finally since nineteen eighty-three at the Institute of Research on Development. As early as nineteen seventy seven, I worked with Dr Anne Retel-Laurentin who was leading research on women infertility, at a time when it was difficult for the funding bodies to subsidize surveys on the struggle against women sterility, as many of them had a lot of children. That was in the late seventies. So, I immediately worked with doctors, on the theme of women and child health.

Finally, I will add that it is very useful for an anthropologist to work with a medical staff and not only near the population.

This approach enables us to understand and analyze the misunderstandings, the tensions between one another. If a good relationship between the medical staff and the patients is not yet a claim from the Southern patients, we know, nevertheless, that it determines widely the compliance of sick people.

When doctors and nutritionists request social science researchers on malnutrition, the first observation is the difficulty for the mothers to link the child’s state of health and his nutritional state.

From this point of view, the anthropologist can explore different levels of explanation and research on malnutrition.

We can work, first, from the families points of view, and then from the medical staff's.

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At last, we can also study the gap between one and the other, and even the failure of the public health system.

My purpose, today, is to sum up the different approaches used by anthropologists in the study of malnutrition.

On the family side, the anthropological surveys have stressed the child’s conceptions, the interpretation of his diseases, of his development, and of his death.

They have, also, explored the social management of food in the family, mainly the access to resources, breastfeeding, weaning, getting to the family dish, the ways in which siblings share available food, and so on.

The main idea, regarding the representation of child development from the families’ point of view is that the child is an actor of his development.

This perception of the child is considered by health workers as a difficulty in the understanding of the mothers’ behaviour. Actually, the child is expected to ask for food and if he doesn’t, the mothers don’t oblige him, for fear the child will go to “the other world”, as the customs says. Child is seen as a vulnerable person, who mustn’t be bothered because he is able to pass away.

All the mothering practices are influenced by this perception of the child. A weaned child proves he wants to stay in this world. Till the weaning, the child is protected, comforted when he is crying, never scolded; whereas once he is weaned his education will become hard and sometimes violent.

The child goes from an ideal relation with his mother to a severe upbringing education. This perception of child development determines the interpretation of his disease and death. From pregnancy to weaning, the symptoms of the child reflect family conflicts and tensions. The biological body becomes the metaphor of the social body. The parents have to identify these social forces, struggling inside the body of their children, to cure them.

Thus, disease and death are caught in a religious representation of the world.

In daily life, people don’t always systematically refer to this kind of explanation of the disease. They, often, use popular medical words to explain the state of health of their children.

Anthropologists have tried to know if malnutrition is expressed by specific words relating to a medical reality or a cultural model of interpretation.

Even European doctors, as you know, have borrowed a local Ghanaian term to call this disease. So, kwashiorkor seems to be the first name given to the second child after the death of the oldest. We can, also, think of the expression “weaning disease”, very popular in Africa.
In central Africa, this disease is called “the red children disease”, referring to the red hair of some of these children.

Actually, malnutrition has traditionally been perceived as a disease by population and by doctors as early as the forties. All of them linked illness and weaning – according to Doctor Williams in nineteen thirty two who called this disease “the one the child is suffering from when he is evicted from the maternal breast – but for the first ones the disease come from a lack of milk or a bad milk, and for the other ones, it comes from a lack of solid food.

For these populations, the problem comes more from breastfeeding than solid food diet. Besides each child owns his mother’s milk. Therefore, if the woman is pregnant again, she will suddenly stop breastfeeding to the detriment of the oldest. This statement tends to show that the improvement of malnutrition requires the improvement of family planning.

Having said that, for us, it seems illogical that some African populations would call malnutrition “the weaning disease” and, at the same time, not link loose of weight to lack of food on nutritional deficiency.

In fact, the populations regard their children as ill and not as ill-fed.

Nevertheless, the approach of malnutrition only in terms of cultural criteria without an analysis of public health can be dangerous. Why? Because, the reasons of the problem, in a cultural analysis, could be considered through people’s way of thinking and not through their way of life.

By “Way of life” I mean not only wealth status of the family but also school level, the range of the child in the family, access to medical care and psychological problems of mothers (for example, I think of teenagers pregnancies, women left alone, HIV positive women)

It is dangerous to tackle the problem on a mere culturalistic approach because the health care workers will persist in thinking they have only to change the state of mind of people and not the public health policy.

Furthermore, we live at a time when people, even in the villages of Africa, are moving and changing.

In spite of this, I don’t mean we mustn’t be interested in traditional meanings, beliefs and practices. Not at all. Traditional explanations of diseases and local terminologies must be known to understand some behaviours and they also reveal a strong will of surviving and the permanent fear of a lineage without descendance. And these ethnographic statements enable us to think people are not so fatalistic as some would believe.
Anthropologists’ surveys also consider mother’s behaviours when the child is sick. I am referring to therapeutic recourses.

What are the different reasons why women go so late to the hospital and what sort of symptoms alert them?

There are, in fact, two main levels to consider:
First, the question of recourses to medical care in general and particularly in case of malnutrition.
Second, the perception of risk and seriousness for the mother.

We know that **fever is the first sign of worrying and consulting**. A simple diarrhoea does not lead to hospital, even a loss of weight in sub-Saharan. Diarrhoea is a domestic concern.

It’s important to study the different stages of illness, from the slightest to the most serious, according to the family. A kind of social dramatization seems to be necessary to bring people to a consultation. By social dramatization I mean a series of events in the family focused on the child symptoms.

At the consultation, women expect a special medicine for their child’s disease and the medical staff tries to explain to them they have to change their feeding behaviour. So, the medical answer doesn’t fit the expectation.

But, even if the nursing team knows the social conditions of sharing food, they forget this knowledge and put forward their medical culture. Furthermore, after weaning, mothers do not control the food portion.

Let me tell you an anecdote about it.

I must admit that without meat and eggs, I had a difficult personal problem to solve, when I was a young researcher, living in an African family. I was very often tired and weak. At last, I bought a lamb’s leg which I gave to the wife in charge of the cooking and I imagined at least a few cooked pieces of meat would be given back to me – naïvely or selfishly, it depends on which side of the desert you are -. Every time, the lamb was cut into small pieces and mixed with the sauce which was so hot that neither the children nor myself could catch anything. The fastest teenagers caught the pieces of meat first. As a last resort, I decided to behave like the men in the family. So I strolled to the market and I bought meat kebab that I ate walking along. I brought back peanuts, spices and pieces of lamb to please the women but without expecting anything to eat anymore. Of course small children were not lucky enough to be able to do the same!

This anecdote shows different ways to access to food, not only through family cooking, but also through other networks of exchange from which children are often excluded.
Besides, several anthropologists have been interested in exchange networks of cooked food between women of the same district.

At the point of my purpose, we have seen the dangers of a mere culturalistic approach, which provides some medical staff with the idea that women are ignorant.

We have also seen that an exclusive medical culture approach doesn’t account for the social conditions of life and leads to a lot of misunderstanding between medical staff and populations.

So, in terms of recommendations we can advise the medical staff to take into account the fact that they must contextualize their development models.

Finally, we can also point out the necessity not to disqualify mothers in their educational function. We know that women are not able to support their isolation, their numerous pregnancies, and all of the other difficulties they are confronted with. Their psychological state must also be considered.
Introduction

Impaired child growth — indicated by poor anthropometric status — is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. Children who suffer from growth retardation as a result of poor diets and/or recurrent infections tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases, such as malaria, meningitis or pneumonia (1-3). A number of studies have demonstrated the association between increasing severity of anthropometric deficits and mortality, and the substantial contribution to child mortality of all degrees of malnutrition is now widely accepted (4). In addition, there is strong evidence that impaired growth is associated with delayed mental development, poor school performance, and reduced intellectual capacity (5-7).

The internationally recommended way to assess malnutrition at population level is to take body or anthropometric measurements (e.g., weight and height). Based on combinations of these body measurements anthropometric indices are constructed. These indices are essential for the interpretation of body measurements as the weight alone has, for example, no meaning unless it is related to an individual’s age or height (8). In children the three most commonly used anthropometric indices are weight-for-height, height-for-age and weight-for-age. These indices can be expressed in terms of z-scores, percentiles, or percent of median, which enable comparison of a child or a group of children with a reference population.

For many years the WHO Department of Nutrition has been using anthropometric data to monitor trends in child malnutrition. A major difficulty has been the lack of comparability of survey results. Although numerous nutritional surveys have been conducted since the 1970s, many of them have used distinct

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definitions of malnutrition (i.e., different anthropometric indices, reporting systems, cut-off points and reference values) thus making comparison of results between studies difficult. This lack of comparable data prompted the beginning of WHO’s systematic collection and standardization of information on the nutritional status of the world’s under-five population. The WHO Global Database on Child Growth and Malnutrition (henceforth referred to as the “database”) was initiated in 1986 to compile, standardize, and disseminate results of nutritional surveys performed worldwide. The specific objectives of this database are to characterize nutritional status; enable international comparisons of nutritional data; identify populations in need; help evaluate nutritional and health interventions; monitor secular trends in child growth; and raise political awareness of nutritional problems. A distinct feature of the database is the systematic analysis of raw data sets in a standard format to produce comparable results. This paper describes the methodology applied in the database and provides examples of how the compiled information is used for promoting healthy growth and development of children.

Methodology

Data sources

Nutritional surveys for inclusion in the database are identified primarily by the following mechanisms:

- An automated literature search in MEDLINE provides weekly updates of bibliographic references according to an established search history. Selected abstracts are reviewed and full articles of relevant surveys obtained from the WHO library;
- A wide network of national and international collaborators provides information directly to the database managers. These include WHO Regional Offices, UN-sister organizations (e.g., FAO, UNICEF, World Bank), non-governmental organizations (e.g., Macro International, Helen Keller International), Ministries of Health and other national institutions (e.g., National Institutes of Nutrition and Statistics), as well as research and academic institutions;
- Principal investigators of nutritional surveys send the data to the database managers;
- Other WHO database managers share information on newly available survey data.
Criteria for inclusion and data quality control

The main criteria for including surveys in the database are:

- A defined population-based sampling frame, allowing inferences to be drawn on an entire population;
- A probabilistic sampling procedure involving at least 400 children;
- Use of standard anthropometric measurement techniques;
- Presentation of results in z-scores in relation to the NCHS/WHO international reference or availability of the raw data, permitting a standardized analysis.

Before inclusion the sampling method applied in each survey is carefully reviewed to ensure population-based representativeness on the administrative level that applies (e.g., national, regional, province, district, local). The majority of national surveys use multistage random sampling methods with only a few countries — such as Argentina, Chile, Croatia, Uruguay and Venezuela — basing their estimates on national nutritional surveillance systems with high population coverage. Surveys generally follow standard measurement techniques, such as measuring supine length up to 24 months of age and standing height from 24 months onwards (8).

Detailed information on the procedures and sampling method used in each survey is given in the comprehensive survey reports that are archived in the database’s documentation centre and is made available to users on request.

As part of routine data quality control, survey results are checked for inconsistencies between the estimates based on height-for-age, weight-for-age and weight-for-height. The observed standard deviations (SDs) of the z-score distribution are used to assess the quality of the survey data. With accurate age estimates and anthropometric measurements, the SDs of the observed height-for-age, weight-for-age and weight-for-height z-score distributions should be relatively constant and close to the expected value of 1.0 for the reference distribution (ranging within approximately 0.2 units). This nearly constant SD in height- and weight-based z-score distributions provides an opportunity to assess data quality (8). Surveys with an SD outside the expected ranges require closer examination because of possible problems related to age assessment and/or anthropometric measurements. Surveys with obvious inaccurate data resulting from measurement error or incorrect age reporting are generally excluded.
Figure 1: Database workflow

Figure 1 describes the workflow of the database. Once a potentially relevant survey is identified and the documentation obtained, the methods are reviewed as described above. If the survey qualifies for inclusion, the available information is extracted from the documents and filled into the standard data-entry form. Frequently there are methodological queries and/or inconsistencies, as well as additional results that are needed in order to complete the data-entry form. To clarify the queries and obtain the additional results the principal investigators and/or data holders are contacted and a collaboration is established. In many occasions further analysis of the raw data is required. Consequently the analysis is conducted either by the data holders (with technical assistance from the database managers if necessary) or else the raw data set is provided to WHO for standard analysis. Software named ANTHRO, which can be downloaded from the database’s web site at http://www.who.int/nutgrowthdb, was developed to facilitate the standard analysis following the databases’ format. Once the data-entry form is completed, final consistency checks across indicators.
take place and the results entered into the computerized system. The full documentation and correspondence with the data holders, as well as any electronic copies of raw data and analysis files are archived in the database’s documentation centre.

**Data standardization**

A distinct feature of the database is the collection of information in a standard format consisting of:

- Prevalences of underweight (low weight-for-age), stunting (low height-for-age), wasting (low weight-for-height) and overweight (high weight-for-height).  
- Use of the NCHS/WHO international reference population to derive estimates.  
- Use of z-scores cut-off points (i.e., standard deviation (SD) scores): <-2SD, <-3SD and >+2 SD.  
- Calculation of summary statistics: means and standard deviations of z-scores.  
- Stratification of the results by age group, sex, region, urban/rural.

Detailed information on the use and interpretation of the anthropometric indicators, cut-off points, and summary statistics included in the database has been published elsewhere \(8,9\) and is also available online at the database’s web site.

Current developments with regards to the reference data deserve special mentioning here. Anthropometric values are compared across individuals or populations in relation to a set of reference values and the choice of the reference population has a significant impact on the proportion of children identified as being under- and over-nourished. Since the late 1970s WHO has been recommending the National Centre for Health Statistics (NCHS) growth reference, the so-called NCHS/WHO international reference population, for the comparison and presentation of child growth data. A detailed account of the history of the NCHS/WHO reference and general issues that need to be considered when using international reference data are discussed elsewhere \(10,11\). In the mid-1990s the NCHS/WHO international reference was found to have important technical and biological drawbacks \(8,12\). Consequently, an international effort co-ordinated by WHO is presently developing a new international growth reference for infants and young children \(13\). This new international reference, constructed from primary data collected for this purpose, includes a number of features, which will result in a reference population substantially different from the existing ones. An important characteristic is that it will be based on a truly international
sample. Six countries, representing the major global geographic regions, are participating in this effort. Another notable feature is that it takes the breast-fed infant as the biological “norm”, recognizing the health and nutritional benefits of breast-feeding \((14)\). The extent to which the new curves — expected to be available in 2005 — differ from the current ones in shape and the spread of values around the mean will affect the estimates of under- and over-nutrition that have been established using the NCHS/WHO international reference.

**Data analysis**

The analyses related to the database consist of two separate steps. The first step is the primary data analysis of raw data sets to produce standardized results as described above. To date, more than 400 national and sub-national nutritional surveys have been analyzed to produce standardized prevalences of underweight, wasting, stunting and overweight. The primary analysis of raw data is essential because many nutritional surveys use distinct definitions of malnutrition making comparison across surveys impossible. This was also an important barrier to pooling individual survey data for deriving regional and global estimates. The primary analysis of raw data represents a major and time consuming undertaking. It implies gaining access to the raw data and description of codes and, then, conducting the analysis of large and complex data files. After making the survey results comparable, on a second step, nationally representative survey data are pooled to derive regional and global estimates of under- and over-nutrition in under-fives. Specific statistical analyses used for this purpose (e.g., multilevel modelling) are described in the relevant publications \((9,15-17)\).

**Results**

As of November 2001 the database included a total of 801 nutrition surveys carried out from 1960 onwards: 370 national surveys from 133 countries and 431 sub-national surveys from 152 countries. A total of 2274 bibliographic citations are included in the reference system. The population coverage of national nutrition surveys is 99% and 64% of children under-five years of age in developing and developed countries, respectively.

The wealth of information compiled in the database has made it possible to conduct in-depth analyses of the levels, trends, and geographical distribution of childhood malnutrition worldwide. Initial results from the database where published in 1993 \((15)\) and
updated in 1997 (9). The latter publication also presented for the first time estimates of trends in child growth retardation in developing countries. A more recent analysis updated these earlier estimates and described trends in childhood malnutrition from 1980-2005 (16). The distribution of stunting in developing countries according to the latest prevalence data, are categorized as low, medium, high and very high (<20%, 20-29%, 30-39% and ≥ 40%, respectively) (9). The rates of stunting in many countries of sub-Saharan Africa, South-central Asia and South-eastern Asia remain very high. In Latin America and the Caribbean the majority of countries have low or moderate rates. Country-specific prevalence rates disaggregated by sex, age group, area of residence, and administrative region can be found on the database’s web site.

The large number of countries with at least two data points (Table 1) enabled to forecast trends in childhood stunting. For this purpose multilevel modelling was applied to the prevalence of stunting allowing for variation in time, country and region (18). Figures 2 and 3 show trends in stunting from 1980 to 2020 in prevalence and numbers, respectively. Estimated trends indicate that overall stunting rates in developing countries will continue to decrease from 29.8% in 2000 to 16.3% in 2020. Progress will however be uneven in different regions. In Africa a minor improvement in the prevalence from 34.9% to 31.1% is predicted for the next 20 years, translating, however, into increasing numbers of affected children (from 44 million in 2000 to 48 million in 2020) due to population growth. In Asia, Latin America and the Caribbean, both the prevalence and numbers of stunted children are expected to continue to decrease further during the same time period.

Table 1: Numbers of countries and data points for stunting by UN regions used in the study

<table>
<thead>
<tr>
<th>Regions and sub-regions</th>
<th>Number of countries/total</th>
<th>Number of data points</th>
<th>Number of countries with at least 2 data points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>49 / 53</td>
<td>114</td>
<td>32</td>
</tr>
<tr>
<td>Asia a</td>
<td>34 / 46</td>
<td>80</td>
<td>22</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>25 / 33</td>
<td>84</td>
<td>19</td>
</tr>
<tr>
<td>Oceania b</td>
<td>6 / 15</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>All developing countries</td>
<td>115 / 147</td>
<td>286</td>
<td>74</td>
</tr>
</tbody>
</table>

*Excluding Japan  
*bExcluding Australia and New Zealand
Figure 2: Trends in % stunting (1980-2020) by UN regions with 95% confidence intervals (box-whisker plots are at 5-year intervals)

Figure 3: Trends in numbers of stunted children (1980-2020) by UN regions with 95% confidence intervals (bar plots are at 5-year intervals)
Overweight, reflecting the other extreme of malnutrition in children, has become a matter of growing concern. In developed countries several studies have shown increasing rates of overweight in children, whereas, in developing countries the extent of the problem was unknown given that surveys had not been analyzed to report this information. The standard analysis of raw data sets for the database has allowed to fill this gap by quantifying patterns and trends of overweight among pre-school children in developing countries (17).

**Figure 4: National overweight and wasting prevalence**
Figure 4 shows the latest data on prevalence of overweight and wasting in children aged <5 years in 102 countries listed by wasting rates in descending order (19). Prevalences of overweight and wasted children are presented together to enable comparisons between both ends of the distribution. Countries with the highest prevalences of overweight are located mainly in the Middle East, North Africa, and Latin America. Rates of wasting were generally higher than those of overweight and Africa and Asia had wasting rates 2.5-3.5 times higher than rates of overweight. The results of this analysis show that attention should be paid to monitoring levels and trends of overweight in children. However, this should not be done at the expense of decreasing international commitments to alleviating undernutrition (17).

Another recent use of the information collected by the database has been the assessment of the timing of growth faltering worldwide and its implications for interventions for preventing child malnutrition (20). An analysis of 39 nationally representative data sets from recent surveys in developing countries showed that the mean z-scores of length/height-for-age at birth are very similar in Africa, Asia and Latin America, and close to the NCHS growth reference. In all 3 regions, however, the mean z-score falls sharply from birth to about 24 months and continues to fall well into the third year, albeit at a slower rate (Figure 5). The magnitude of the drop in Latin America and the Caribbean is about 1.25 SD, whereas in Africa and Asia the drop is of approximately 2 SD (20). An important finding of this analysis is the remarkable similarity of the patterns of growth faltering in developing countries, not only within a region but also globally, despite the different instruments and measuring techniques used in the various surveys. These results show that interventions during the earliest periods of life are likely to have the greatest impact in preventing child malnutrition. Special emphasis should thus be given to the development of effective interventions to stop the critical faltering that occurs from birth to 24 months.
In May 1999 the database was made accessible on the Internet at the web address http://www.who.int/nutgrowthdb. The database’s web site — updated bimonthly — enables its users anywhere in the world to obtain at any time the latest information from the database. Following the launch of this web site the number of the database users has been continuously increasing. To this point in time, the database’s web site has more than 5600 registrations and there are many direct links to it. In addition to the numerous individual users, the United Nations (UN) organizations such as the ACC/SCN, FAO, UNICEF, the UN Population Division of the Department of Economics and Social Affairs, and the World Bank use regularly the information included in this database for their routine reporting on child nutritional status and its association with other health and socio-economic indicators (21-27). Similarly, many national and international institutions and non-governmental organizations use the database as the data source for information on child malnutrition (28,29).

Conclusions

The 15 years experience of the database can be regarded as a success story of international collaboration in standardizing child growth data. This success can be measured by the wide acceptance
of the database’s principles, the range of uses being made of the data, and the steadily growing network of collaborators. The database relies heavily on this network which has been developing a dynamic of its own leading to the early involvement of the database managers in large-scale surveys. This reflects the high interest of collaborators in supporting WHO in this global effort of monitoring child growth and malnutrition. The experience of the WHO Global Database on Child Growth and Malnutrition could be a model to follow for monitoring other nutritional disorders and/or health conditions that lack comparable data.

While continuing its routine, the database faces a number of challenges. First, the release and implementation of the new international growth reference in 2005 will have important implications for the management of the database. Second, trends in nutritional status for countries undergoing nutritional transition indicate the need to pay close attention to the monitoring of overweight and obesity during childhood (17). Users of population-based estimates should shift in their concentration on the traditional indicator of weight-for-age to focus more on length/height-for-age as well as weight-for-length/height. This would allow identifying stunted children of low weight-for-age but normal weight-for-length/height, to whom excess energy should not be given since this could lead to obesity (30). Third, the association between prenatal and postnatal growth and the magnitude of the problem of intrauterine growth retardation (IUGR) in developing countries (31) calls for the need to incorporate into the database the monitoring of impaired foetal growth. A potential methodology that will allow overcoming current constraints to derive population-based estimates of IUGR is currently being developed. Monitoring the patterns and trends of IUGR is expected to trigger public health action in populations where interventions aimed at preventing foetal growth retardation are urgently needed. Lastly, the availability of reference data for motor development milestones being developed as part of the new international growth reference (14) will provide the possibility to monitor motor development, establishing an important link between physical growth and development in children.

The future of human societies relies on children being able to achieve their optimal physical growth and development. The database serves to increase awareness of the magnitude of the problem of child malnutrition worldwide and to alert decision-makers of how much remains to be done in order to ensure children’s healthy growth and development.
Acknowledgements

We are grateful for the statistical support by Dr Allen Shoemaker in conducting primary data analysis of raw data sets and Drs Edward Frongillo and Richard Morris in deriving the model estimates of the regional and global trends.

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HEALTH PROFESSIONALS’ PERCEPTIONS
OF GROWTH MONITORING AND PROMOTION PROGRAMMES IN SELECTED DEVELOPING COUNTRIES

Dominique Roberfroid¹, Pierre Lefèvre¹, Patrick Kolsteren¹, Tom Hoerée¹

Introduction

The WHO defined Growth Monitoring and Promotion (GMP) as a nutrition intervention that not only measures and charts weight of children, but also uses information on physical growth to counsel parents in order to motivate actions that improve growth (1). From this perspective, the growth chart was proposed as an educational tool to make the child growth visible to both health workers and mothers (2). In case of adequate growth, parents could be encouraged and be given advice on how to preserve the good growth of their child. In case of growth faltering, the condition could be detected and made apparent long before any easily observable signs or symptoms of malnutrition become evident. This would trigger a reaction of health workers and caretakers in order to institute timely corrective measures and put the child back on an upward growth trajectory (3-6). To put it in a different way, parents are expected to appropriate the chart as a tool to evaluate and understand the growth and development of their children.

As malnutrition is an important factor associated to the high under-five mortality rates observed in developing countries (7,8), great hopes have been put in GMP programmes to achieve the goals of the Child Survival and Development Revolution (2,9). However, several authors have pointed out that despite important international efforts, there is little evidence of achieving these goals (10). Explanations for this failure have been sought in the poor performance of the growth chart as a measurement tool, the insufficient or inadequate training and supervision of basic health workers (11) and the poor understanding by parents, particularly those with low school achievement (12-15).

In the whole debate on growth monitoring, the way mothers understand and use the growth chart has received much attention.

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How health managers, such as District Medical Officers who organize the health system and the activities, view and appreciate growth monitoring has, to our knowledge, never been addressed. This is quite surprising when one considers that they bear the responsibility for implementing GMP at the local level and as such constitute the main articulation between international health policies and national/regional contexts of application. The aim of this qualitative research was therefore to explore the perceptions of these professionals regarding GMP and understand their difficulties and expectations.

Methods

Between October and December 2000, 18 district medical officers from South America, Europe, Africa and Asia were interviewed by an anthropologist with a medical background. They were randomly selected from a class beginning a public health master programme in Antwerp, Belgium. All of the interviewees were or had an experience as District Medical Officer.

Table 1: Characteristics of participants

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Country</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>M</td>
<td>Burkina Faso District Medical Officer</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>M</td>
<td>Bolivia Head of Health Centre</td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>M</td>
<td>Morocco Head of Hospital</td>
</tr>
<tr>
<td>4</td>
<td>42</td>
<td>M</td>
<td>Conakry Guinea Prefecture Medical Officer</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
<td>M</td>
<td>Chad District Medical Officer</td>
</tr>
<tr>
<td>6</td>
<td>35</td>
<td>M</td>
<td>Zambia* Medical Officer</td>
</tr>
<tr>
<td>7</td>
<td>36</td>
<td>F</td>
<td>Niger Regional Medical Officer</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>M</td>
<td>Morocco Head of Medicine Service in hospital</td>
</tr>
<tr>
<td>9</td>
<td>38</td>
<td>M</td>
<td>Ivory Coast District Medical Officer</td>
</tr>
<tr>
<td>10</td>
<td>37</td>
<td>M</td>
<td>Haiti Head of Planning Service, Ministry of Health</td>
</tr>
<tr>
<td>11</td>
<td>36</td>
<td>F</td>
<td>Rwanda Medical Officer</td>
</tr>
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<td>30</td>
<td>M</td>
<td>Cuba Director of Health Services</td>
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<td>46</td>
<td>M</td>
<td>Chad** Paediatrician</td>
</tr>
<tr>
<td>16</td>
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<td>F</td>
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<tr>
<td>17</td>
<td>43</td>
<td>M</td>
<td>Bangladesh Head of Field Service Unit of sub-district</td>
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<tr>
<td>18</td>
<td>29</td>
<td>M</td>
<td>Zimbabwe Medical Officer</td>
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<tr>
<td>19</td>
<td>32</td>
<td>M</td>
<td>Kenya Paediatrician, Research Officer</td>
</tr>
</tbody>
</table>

Nationality: *=Belgian, **=Italian.
Other participants were working in their own country
The in-depth interviews were conducted in French and English and lasted 45 minutes to 75 minutes. A series of structured prompting questions was used (see Table 2). All interviews were tape-recorded with the respondent’s permission and fully transcribed. Transcription was done by a secretary and was checked against the recordings by the reviewer to ensure accuracy. Data were coded using QSR Nudist 5.0 software (QSR International Pty. Ltd., Melbourne, Australia. 2000) to facilitate cross-indexing. Coding in thematic blocks was made on the basis of the prompting questions, but also iteratively for themes emerging during the close examination of the transcripts. Analysis of data was performed by the interviewer and cross-checked by a sociologist to ensure reliability (16,17). The transcripts of the interviews were analyzed for the discourses that participants drew on to articulate their understandings and experiences of GMP. It is accepted in such research that the discourses articulated by the participants emerge from a pre-established stock of discourses already circulating in a culture, i.e. the field of international health in this case. The use of discourse is highly socially contextual. The data were thus considered as social constructs, i.e. as displays of perceptions, belief systems or assumptions, not as presentation of versions of “reality”.

Table 2: List of the prompting questions used during the interviews

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
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<tbody>
<tr>
<td>1</td>
<td>Did/do you use the growth chart in your work? In which circumstances? What do you think of it? What were/are your expectations/objectives in using such tool? Were they satisfied?</td>
</tr>
<tr>
<td>2</td>
<td>In your experience, do you consider that the GMP programme was well done? On what criteria do you base your evaluation? How would you define a good GMP programme?</td>
</tr>
<tr>
<td>3</td>
<td>If the UNICEF proposes, for whatever reason, to stop using the growth chart, how this recommendation would modify programmes aimed at improving health and growth of children in your country?</td>
</tr>
<tr>
<td>4</td>
<td>Do you consider that GMP contributes to improve child health? If yes, by which mechanisms? If no, what are, according to you, the problems, the impediments, the conditions that should be met?</td>
</tr>
<tr>
<td>5</td>
<td>Did/do the parents use the growth chart? Do they find it useful? How do they measure the growth and development of their children? Do they use other criteria than the weight and the height to do so? How did/do you proceed with your own child (children)?</td>
</tr>
<tr>
<td>6</td>
<td>You said that a copy of the growth chart was given to the mother. What was the rationale for doing so? Was it realized?</td>
</tr>
<tr>
<td>7</td>
<td>What conclusions would you like to draw following our discussion?</td>
</tr>
</tbody>
</table>
Results

The interviews collected a large variety of experiences and opinions, reflecting the international pattern of the panel. Interviewees were coming from settings where nutritional issues, malnutrition rate, literacy rate, health policy, organization and resources of health services differed a lot (see table 1). Interviewees themselves had a very different personal and professional history, although all were medical doctors and had served as District Medical Officer.

Despite this variety of backgrounds, the interviews were quite homogeneous in the appreciation of the effectiveness of growth monitoring. The majority of the interviewees expressed the opinion that, in their experience, GMP did not work the way it ought to.

"In theory, we have to follow-up a lot of parameters. In reality, it is mainly focused on vaccination activities..." (12, 42-44)
"I would say it is quite a difficult activity because we have a lot of difficulty to carry it out [...]. In the context of Chad, I think, yes, that this is nearly utopian" (5, 291-293)
"Of course, we did it [GMP]. There are many things done only by routine. It was there, so we kept it on, maybe due to the lack of time to find a new strategy" (6,140-141)
"In theory, it is a good tool, it is very interesting, but in practice, it is different. It is maybe more a tool for me than for the mother. To do evaluations, statistics" (15,168-170)

This discrepancy between theory and practice of GMP was indeed identified at two levels in the discourse of the participants, first in the narrative of personal experiences, second in the expression of understandings and perceptions of GMP.

Narrative of personal experiences

Interviewees evoked operational difficulties in the implementation of GMP. The most consistently reported reason was irregular attendance of mothers at weighing sessions once the vaccination schedule was completed. Participants explained this as a lack of interest of mothers in programmes, which do not display technical acts and visible effects. Mothers were also said to rely on their own criteria to evaluate their child’s growth and health, and to refer themselves to health services only in case of obvious child disease (see communications by CedS, pp 87-95, and by Emma, p 80-86).
"Maybe malnutrition is not perceived as an infectious disease. Measles is something striking, is something that people know well. Malnutrition becomes a problem when it is severe. When it is moderate, people do not notice it." (15,183-187)

"Ideally, it is an objective of prevention. But in practice, it is as I told you. For health agents as for beneficiaries, it is rather when there is a problem" (1,622-623)

«Because in general mothers when they think their child is in good health, he runs, he gambols, they do not see the necessity to bring the child only for parameters measurements...»(5, 30-32)

An additional explanation of the poor adherence to the programme put forward was the weakness of awareness campaigns for GMP to motivate parents to adhere to the programme. The responsibility of this was partly attributed to health workers and their low motivation to perform GMP activities. Low competence and the heavy workload of field staff were presented as impediments to GMP, although it was not clear why GMP should have been more particularly affected by these 2 limitations than other health activities.

"It is neglect somehow. But it is also due to the (low) interest of health agents for nutritional problems" (1,353-355)"

"Thus the nurse can have the feeling that her effort is a little bit useless, disproportionate, not always, but sometimes. You have to control, to put some pressure on her but always you have to keep in mind that there are a lot of other tasks, maybe more crucial in the context" (2,150-153)

"Often, the problem is that our health agents can not argue properly with an old mother who has 12 or 15 children. What advice could you give her? You do not advice her because this woman knows better than you how to manage a child. Often people [health workers] are limited because their basic background is not enough..." (7, 187-193)

"When they get too busy, they have a lot of forms to fill in, then do not explain well to the mothers. They also think that it is not that important that mothers understand, because the understanding point is quite low, you see." (16, 58-61)

A second group of limitations of growth monitoring put forward related to the capacity of response of parents to the information provided. First it was said that the parents fail to

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2 This was particularly mentioned in Sub-Saharan countries where the responsibility of the GMP is beared most of the time by basic health workers.
understand the growth chart, mainly because they are illiterate or not educated.

"...Because in our country, they are illiterate. They do not understand too much what is written on it [the growth chart], it is not too much their concern..." (1,341)

"The literacy rate is not very high. So she [the mother] goes home and she doesn’t know" (9,265-266)

"But I am wondering if she [the mother] really understands. Because it is simple, but sometimes nurses also have difficulties to fill in [the growth chart]..." (15, 209-210)

"It is difficult to implement because people are mostly illiterate. There is a lack of enthusiasm, of knowledge; they cannot understand what is good for them, what is bad for them. Illiterate mothers tend to participate less, they are less concerned" (17, 23-26)

Secondly, the lack of response to the messages was related to food insecurity and thus limited applicability of nutrition advice in some contexts.

"You will say 'he is malnourished, you must feed him'. But they know it, they know that the child does not eat very well because it is the same meal every morning, every lunchtime, every evening, there is no milk, it is always bulgur. What are you going to propose? You are not going to propose anything because she won’t have the capacity to apply what you will propose (...) This is a problem. Thus I think they are right not to come to be repeated the same thing ten times" (7,515-523)

Understandings and perceptions of GMP

The preceding results demonstrated that the explanations given for the resented malfunction of GMP relate much to operational problems, in particular the demand of the population for technical aspects and not for promotional aspects. Looking at the statements provided by the interviewees, we find the same dialectic in their discourse between technical (visible, curative) and intuitive (invisible, preventive or promotional) aspects of care. Health officers endorse in fact, consciously or implicitly, the importance of the technical aspects in GMP with much less emphasis put on health and growth promotion.

"This (growth) chart was made in the frame of the national vaccination day, thus the objective is the vaccination. In the mind of
people [health workers], the weight and height monitoring is a secondary objective” (3,278-281)

"Yes, I always said that, the mother has not come to learn that her child gained weight or not. She has come for you to do something else. You do the vaccinations” (18, 201-203)

One of the interviewees did this revealing pun:

"A malnourished one is not going to contaminate somebody else. He does not carry much weight in the society” (9,389)

Strikingly, the criteria used by mother to evaluate their child’s growth, as mentioned above, were grossly unknown by the interviewees but nonetheless qualified as subjective, approximate, and intuitive by them.

"The child has no disease, no diarrhoea, no whooping cough, he walks, and he laughs. That is all. It is a subjective assessment” (13,329-331)

«... But besides this, there is no other means to evaluate, except the physical aspect. Because the majority of mothers, nearly all of them, in the countryside, do not have weighing scale at home, it is just the physical aspect” (10,301-303)

"Thus I think that mother’s perception is a criterion that can not be really defined, but I believe it is important even if it is intuitive”(5,176-177)

"I think these are good criteria because mothers at home need to know and they are not technicians, and the Z-scores are not their concern at all. But for the technician, I think that more technical criteria are required” (9,277-282)

“Their criteria give an idea but this is not something that is very acute (...). We are giving GMP criteria in a scientific way, they [the parents] are not up to that point, they have a very general idea” (17, 356-357)

Thus mothers are said to come for vaccinations because this is part of the technical sphere that is under the responsibility of the health services. They do not come for growth monitoring because this is part of the field of social communication, which is outside the acknowledged and claimed responsibility of health agents. Strikingly, some of the interviewees even tended to consider communication as a “no-act”, while weighing was considered as the technical justification of their presence in GMP. As summarized by one interviewee:
"Finally, to weigh, as I said previously, demonstrates to the mother that an act is done [...]. Secondly, it is also an act, not a medical one, but an act made by the health agents that can encourage the mother to come back the next time. Because if she comes to sit down and listen the advice, it is not so clear that she will come because, in the village spirit, she will think it is not so useful to go only for advice. That is what I think" (5,132-147)

"Her task [the village volunteer] is much more to gather the mothers and to be willing to listen to them but she does not act" (5,344-45)

From this perspective, communication with parents on the basis of the growth curve is secondary. It was never reported as a means or a result of GMP, nor as a criterion to evaluate the programme during supervision sessions. The growth chart was mainly considered as a tool intended to be used by health services for diagnostic purposes and for the health information system. The following example can serve as a good illustration of it. In every country, the growth chart, or a copy of it, is given to the parents. But the rationale for doing so, as expressed by the interviewees, was preservation and transfer of information, in particular information on vaccinations and diseases. Never were cited, for instance, appropriation of the tool by the caretakers or their commitment in monitoring their child’s growth. The fact that caretakers did not understand the content of the chart (and thus were unable to recall the clinical history of their child) was even presented by some interviewees as the precise reason to give it to them, in order to bring it with them at every consultation.

"I find it useful to not lose information. But if there were another means, better to get the information, I think we can let it [the health card] down" (12, 225-227)

"The objective is not to discuss with parents to educate them but the objective is to determine if the child is malnourished or not. I think that with that objective, we do not have to discuss with the mother to know if the child gained weight or not" (9,295-297)

Once the diagnosis is made, the focus is on education, recommendations, vertical transmission of information and advice, rather than on communication with the caretakers. Rarely conditions are met for a balanced and specific exchange of information regarding one particular child’s health.

"We measured weight, we look if he [the child] is inside [the growth path] or he is not. If he is not, we advise the mother to do that
or that. The objective is not to improve the relationship with the users” (9,302-304)

“During preschool consultations for instance, they used to measure the weight, to report it, and then to give ex-cathedra a health education session for everybody. And standard advice was given on how to prepare meals, child spacing,...” (6,79-81)

“We developed a strategy: when the weight is becoming stationery, these mothers have to stay after the consultation for nutritional advice” (12,152-153)

“Advice is always given. There is more or less standardized advice. This depends on the experience and competence of health agents to adapt it to the context, to every single mother. But advice is always given” (2,170-173)

One interviewee, mentioning a quite satisfactory ability of his staff to interact with caretakers, perceived the unbalance in the communication process:

“This is my feeling, my understanding: health agents, nurses, doctors can speak well but often can not listen. Maybe that messages and advice will work much better if one can develop the capacity to listen. It is only an idea. It is easy to talk” (2,207-212)

“Our function as parents is to give our views on our conception of malnutrition. I think there are a lot of presupposed things, that maybe are true for us, but maybe are not” (2,448-449)

As mentioned above, the dichotomy was conscious for some of the interviewees. They explained it as the result of their professional training with its focus on curative approach, but also by the fact that the health system itself tended subsequently to give more value to technical acts.

“I think that it depends on the training, I would not say on the ideology, but on the way to see things as we were trained to. Yes, you are health agents; yes you are here to fight against diseases, to heal people. It is how it is said during your training or even on several occasions...” (1,641-645)

“We are not trained on the determinants of nutritional issues, that is to say to evaluate problems in their globality” (1,359-360)

“It is necessary to vaccine, to reach a high coverage. Much more weight is given to that. For instance, if you speak of the minimum package of activities at the level of the Public Health Ministry, they look much more at the immunization coverage than at the management of malnourished children. It is much more interesting...” (5,195-198)
“Communication with parents is more or less good, but we have to keep them pressurized [the health workers] to make their performances. Are they interested? They are more concerned by immunization because each single case is checked by us, and this is transmitted at the district level. Much emphasis is given nationally on immunization.” (17, 258-62)

Finally, the gap between theory and practice, between what should be done and what is actually implemented, resulted for some medical officers in a feeling that GMP was a frustrating but compulsory routine because prescribed by national and international recommendations. Others got over the contradiction by considering that the programme had still a role to play because there was either no relevant alternative for it or because the growth chart was useful to health services.

"First, this is an activity of the Ministry of Health, thus we can not forget it because of the risk of being reprimanded (...). It is the WHO, the UNICEF who advised to do so. It is the WHO who said we have to do that. If not, certain things are not funded, so we do it" (13, 363-371)

"Because the doctor feels very nice, very comfortable with the Mother-and-Child programme. It is a priority programme of the Ministry of Health" (14, 51-52)

"I would say that most of the time we do it because we were told to do so, the WHO told us that it was useful, important, it was interesting, but I think that in every-day practice, with some experience, you can manage without the growth chart" (15, 66-69)

"It won't change anything if we stop the programme. All the more that the coverage rate is not high. Thus with or without the chart, we work the same way. [Hesitation]. But even so, it is a tool for the management of activities that we can maintain" (19, 154-157).

"I do not believe that used as it is it will make great changes. On the other hand, could it be useful in a more global approach? I still have to think about it. But it is even so useful; there is something visual in it. And as a tool, there is always an explanation phase, it could be useful indeed" (6, 115-120)

"And before abolishing, you need something to replace it, a valid alternative, and we do not have it. We have no time for it and I think that there would be some resistance from the staff to not use it anymore" (16, 143-146)
Discussion

This study was exposed to two potential limitations. The first one concerns the external validity of the results. The DMO’s interviewed constituted a particular group with at least the specificity of beginning a master in public health in a European country. They were not necessarily a representative sample of DMO’s active in the field. The second one concerns a possible information bias. The content of the interviews could have been influenced by the fact that the study took place in the institute where the interviewees were studying and was led by an anthropologist employed by the same institute (18). The Master course is also focused on health care management and not on disease control. It has large emphasis on participatory processes and the provision of health care in a process of communication with the population. Some type of answers could therefore have been considered more appropriate or acceptable to provide to a staff member. If these two limitations were real, they do not contradict or invalidate our analysis however. On the contrary, we would have expected more answers mentioning health service activities committed to communication and transfer of decision-making powers.

Health professionals interviewed in this study reported a two-fold discrepancy between the planned activities and actual practice of GMP.

The first level of discrepancy was linked to operational difficulties in implementing GMP in various contexts. The findings of this study are consistent with those of previous studies. The drop in compliance after the immunization schedule is complete was often mentioned and raised questions about the real acceptability of GMP by the caretakers (19). On how caretakers understand the chart, the reviewed studies reported mitigating results. But overall scores are low (12,20-24). The association with literacy, however, is quite consistently reported in the studies (12). The understanding of the growth chart and of GMP by health workers, on the other hand, has been much less addressed, although it is potentially a crucial element (25-28). For instance, it was shown in one study that when health workers had a correct knowledge of GMP, a substantially higher proportion of growth charts was maintained (23). One potential explanatory factor for the low comprehension rates reported in mothers, as mentioned by some interviewees, could be due to low comprehension or low communication ability of health workers themselves (19,20,24,25). It has been proposed that nutrition education could be more effective by making it more specific, action-oriented, individualized, and relevant (29-31). But
this will be only if clear algorithms for decision-making are available and if health workers are trained in social communication and nutrition negotiation (29). Unfortunately, these conditions appear to be rarely fulfilled under field conditions (13,14,19,25-27,32,33). For instance, a study in Zambia reported little variation between the consultation time of a child who was growing well and one with faltering growth (about 30 seconds in both cases!) (33). In Papua New Guinea, the MCH nurses did not spend any longer if the child was losing weight (27).

The acceptability of growth monitoring by health workers has been poorly investigated. It has often been reported, as did several DMO’s in this study, that health workers perform weighing sessions more like a ritual than anything else. A possible explanation of this attitude can be found in a behavioural study in Papua New Guinea. It showed that nutrition education was a task, which MCH nurses did not enjoy and did not see as very important; consequently it was all but eclipsed by examining, weighing and prescribing (27).

The present study revealed also that most of the medical officers interviewed, by understanding or by conviction, did not attach great importance to the communication process theoretically underlying GMP. Two hypotheses can be proposed to explain the poor results of GMP (34). The concept is either irrelevant or wrongly implemented. The findings of our study widened this second hypothesis. If caretakers, in general, understand and use poorly the growth chart, this might be the final result of a gap in understanding between international policy makers and local implementers. Indeed, in the interviews, GMP appeared quite secondary in Primary Health Care, and communication quite secondary in GMP. But it might be as well that the two hypotheses are strongly interrelated: to implement a same concept (monitoring and promoting growth) with a same tool (graphical representation of the growth) in a variety of cultural contexts and nutritional causalities can be considered a priori irrelevant. The question can be raised if this conceptual and technical sort of imperialism is not antinomic to the idea of communication also imbedded in GMP. For instance, the fact that what constitutes adequate growth does not necessarily overlap between lay people and health professionals has been overlooked (35,36). It was shown in Ghana, for instance, that weight variation was only one indicator among many others traditionally used by caretakers to assess the nutritional status of their children (37). In promotion as in evaluation of GMP, the significance of local beliefs and behaviour patterns concerning child growth has seldom been recognized within the context of more "modern" approaches based on Western concepts of health and disease. The important international promotion of the growth chart
might not have taken various cultural definitions of adequate growth enough into account so far (38-40). Thus it has been proposed that a way of improving GMP would be to bring together the observations and measurements made by both mothers and health workers (20,31,39). However no GMP programme based on such association of criteria has been reported so far. And unfortunately, according to the results of this study, the process seems far from being under way.

References

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HEALTH PROMOTION PRACTICE OF RURAL HEALTH WORKERS IN BOLIVIA - A QUALITATIVE EXPLORATION -

Tom Hoerée¹, Edgar Zambrana², Edgar Sejas³

Introduction

The child health card or the growth chart as promoted by and UNICEF since the sixties, has been criticized since many years and at different occasions (1-4). One major objective, that has been put forward in programmes advocating the use of the card, is that it should assist health personnel and community workers in health education and communication about child health (5). Or in other words that it should help them in their child health promotion practice. The card is then proposed as the main or central tool around which this practice should be organized. Few are the recommendations on how health education and communication should or could be practiced. A concept or framework on how the communication should be practiced is clearly lacking. The consequence is that it is difficult to evaluate the quality of the education and communication that takes place. In this paper we briefly present a framework for consultation - called the patient centered approach developed by family medicine (6)- in which the modes of communication between practitioner and patient are better outlined. The explicit aim of this approach is to assist health personnel in their role of promoting the self-caring capacity of patients.

The aim of the paper is to explore in how far health personnel are practicing a patient-centered approach without been explicitly thought. The underlying hypothesis being that if elements of this approach can be found in the current practice of the health workers, then these could be used to build upon when designing specific interventions for enhancing a more empathic and responsive or patient-centered health promotion practice.

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Methodology

Transcripts from semi-structured interviews on the concepts and practices on promotion of health, growth and development of children under five of health personnel were re-analyzed. A question also probed on how the health card assisted them in health promotion. Two auxiliary nurses (AN1&2: references in citations), one licensed nurse (HN) and two doctors (GP & DIR) working at a rural health centre in Chapare district (Cochabamba province - Bolivia) and one auxiliary nurse (AN3) working at the health post depending of the centre, were interviewed.

The framework on patient-centredness as proposed by Mead & Bower, was used for coding and for organizing the results (7). These authors discern five dimensions of this approach: the bio-psycho-social perspective, the 'patient-as-person', the sharing of power and responsibility, the therapeutic alliance and the 'doctor-as-person'. Citations were coded under the "bio-psycho-social perspective" when personnel talked about the definition or determinants of child health, growth and development. The code "patient-as-person" was attributed to citations where health personnel talked about their own versus the parents' explanatory models of child health and when they indicated their attitudes towards those of the parents. The dimension of "sharing power and responsibility" was investigated by reviewing all the examples given of their daily health promotion practice. Elements of listening and responding to questions with or without the help of the health card were considered as more patient-centered. The "therapeutic dimension" was elicited by checking on how appointments were made and follow-up visits planned. And elements of the "doctor-as-person" dimension were found in citations where personnel commented on the feasibility of integrating health promotion into their daily practice.

Results

The bio-psycho-social dimension

Conceptually child health is understood by all the health personnel interviewed as having biological and psychosocial dimensions. Still as good nutrition, absence of disease and good growth are presented as basic conditions for ultimately a normal development, it seems that most see a hierarchical relation between health, growth and development. In practical terms, growth is equated with measurements of weight and height and development
with the assessment of milestones. The importance of constitution, environmental factors - esp. the family environment - and economical factors in child health are all well understood.

"Ok, health, growth and development of a child, well, I think that those three go together, no? Because when a child is sick, when he has no full health, that child cannot grow and he cannot develop as well, no? To me, health goes together with growth and development. [AN3, 51]"

"And health will have an influence on both, because when health is good, growth is equally good and if this is good, development of the functions will also be good. [GP, 72]"

"As for the 'social' we can speak of those that do not have a relation with other children and ... but that could also be because their mothers forbid them to eat what they want, because there is no money. Meaning that they do not have sufficient revenue for being able to eat what any other child can eat. [AN3, 33]"

"To me, child health means that the child is in good health, protected against disease, that all his rights and needs are well respected, because child health that does not only mean to have everything at home, money. Health means also affection and protection. [AN1, 68-69]"

Listening to their conceptual framework, one would believe that they really have a global view, but listening to how these concepts are translated into daily work, their biomedical orientation becomes clear. Most of the activities they report are related to prevention of disease via vaccinations or informing about diarrhoea or to promotion of good nutrition [citations see under C- Sharing power & responsibility].

These observations did not differ as per educational level of the interviewees. The only difference being that the higher educated - doctors and head nurse - gave more detailed accounts of their thoughts and concepts.

The 'patient-as-person' dimension

The health personnel did not show a highly understanding attitude towards the child rearing practices of the parents. One bluntly said parents are ignorant while another more politely commented that they do not have a conceptual base on child health needs.

"No as for growth and development, they do understand. This is a problem that should be resolved! [DIR, 61]"
I do not think they have a conceptual base for the fact that development is something psychological or intellectual [HN, 178]

But when asked whether they ever discussed these with the parents, none answered directly except one who exclaimed with surprise, "ooh, I never asked..." [AN1, 280]. None indicated much understanding of the parents' difficult life conditions either. As the fact that parents mainly use the health centre when the child is seriously ill and that they do not attend regularly to the healthy baby clinics was interpreted as a lack of understanding and concern and less as a lack of time or resources.

Most often times they bring their children when they are seriously ill, and in the end, they are not concerned about the health of their children. In any case, a number of mothers ... [AN2, 109]

The 'sharing of power and responsibility' dimension

Health promotion is understood primarily as transmitting messages that have to be captured by the mothers. The responsibility of the health personnel goes no further then making sure that the message can be repeated. Health personnel clearly expect the parents to closely follow even 'comply with' their advice, which in their opinion is rarely the case.

Well, when I explain something to them, they understand me as they say "yes, I understood, you said so and so". So, they repeat, meaning that they say what I said them, then I know for myself that these mothers have well understood. [AN3, 123]

There are a few indications that health personnel respond to questions of the mothers. Doctors seem to have a relative advantage over nurses, as within the cabinet they seem to dispose of a bit more time and privacy. Nurses have fewer opportunities of these one-to-one contacts.

So, they themselves open up mentally, and they say things, they suggest others, so you have to accommodate. You feel it when there is interaction with the mother. [GP, 210]

Well, I tell them this in relation with the problem they came for. When they came for diarrhoea, I tell them to wash their hands, ... I tell them that in relation with the pathology for which they consulted and then I try to orient them. [GP, 307]
Two nurses indicate that on a few occasions they were able to listen and respond to questions of mothers.

... In two communities we have organized meetings with the mothers. So, they told us that their children could probably have diarrhoea. So, they told us that sometimes this is because of the dirty water.... So, we gave them an orientation saying that they should first let sediment the water. Then, to boil the water without the deposits. ... All this, so that they could use it and not to drink directly from the river. That is what we told them concerning the diarrhoea, that the water of the river is not good because we know that troubled waters are bad. [AN3, 71]

While I am weighing and measuring the patient, I discuss with the mother. ... I ask her questions on health, whether they told her about vaccinations, growth and development of her child. If she was told already, she explains to me what she knows and I argument bit by bit and I complete what she does not know. [HN, 257-264]

So time availability, opportunity and willingness of the personnel seem to determine whether a certain amount of power and responsibility is shared. The health card does not seem to aid in creating opportunities for listening and responding, rather on the contrary its use more oftentimes leads to transmitting health messages without asking any questions.

So, I show the mother that the weight is going down and I tell her: “the weight of your child is decreasing, that is not good, you do not nourish him well, you should improve on that”. [AN1, 190]

The ‘therapeutic alliance’ dimension

All health personnel interviewed complained about the lack of cooperation by the parents in the follow-up of treatment or the lack of adherence to the vaccination or weight control schedule. It seems that in the perception of the health personnel, the parents do not keep their part of the agreement.

They only come to the health centre when their child is very ill. I mean, they do not come in time for their controls. When the child is healthy and does not become ill, they never set a foot on the doorstep of the centre. They are more regular when their child is frequently ill. Rare are the mothers that come for the controls of their child and I think that they rather come because they feel obliged to ... [GP; 162-163]
The 'doctor-as-person' dimension

As already indicated, time availability is reported as a constraint to proper child health promotion. All complain about it, and in most examples cited where a certain amount of patient-centredness was present, time was less restrained.

Ok, when we went down there, we had conversations with the mothers because we were two nurses to do the job, so we have discussed. In two communities we have organized meetings with the mothers … [AN3, 71]

Where some indicated a need for more training on the subject of child health, none indicated a need for training on better understanding the parents' perspective or on communication skills.

Discussion and conclusions

The three first dimensions of the framework on patient-centredness were fully covered by the interview script that was used during the interviews. Both remaining dimensions were not that well covered. This definitely leads to a partial picture on the level of patient-centredness of the health personnel interviewed and interpretation on these dimensions should be done with caution. However, from the analysis, the discrepancy between theory and practice of promotion of child health, growth and development is striking. Although their conception of child health is very comprehensive, the practice the health personnel reports is on the one hand clearly disease oriented and on the other hand strongly paternalistic in nature. This discrepancy is not surprising as medical education and socialization is known to stimulate these characteristics (8,9). Although far from being systematically practiced, four of the six persons interviewed clearly indicated strong examples of patient-centered practice. This means that to a certain degree an inclination or willingness is present and that with appropriate support this could be further developed into a more systematic practice.

There exists no literature specific to our subject of concern, but our results concur very well with the critique upon which the patient-centered approach was developed (10). Namely, that a clinical method is needed in order to incorporate more systematically non-biomedical concerns into the doctor-patient encounter and into medical decision making. This would mean that our observations are far from context specific and that it seems that we documented a problem that is rather linked to our scientific -
rational or reductionist - way of practicing medicine. Encouraging is that the more comprehensive or 'holistic' concept of child health, growth and development is well known to the personnel interviewed. And that there is not much difference in understanding this between the higher and the lesser trained. What lacks is the integration of this concept into daily practice. As such the concept of patient-centredness could be introduced in medical and nursing schools and in continued education programmes for professionals.

Three topics seem in need of further elaboration and attention in these education and training programmes: a better understanding of the mediating role of the parents in child health, openness to the perspective of the parents and practical training on what advise to give on child development. The socio-economic determinants of child health are well understood but health personnel need to appreciate more the central and mediating role of the parents. In other words, they need to better understand the difficulties of parents in coping with these factors while trying to preserve the health of their children. This understanding will be facilitated when health personnel during their different training programmes also learn to see child health from the parents' perspective. Courses on different explanatory models and practical exercises on communication skills are some of the methods that can be used to sharpen their empathic abilities and lessen their paternalistic attitude.

The third topic that should be better covered in these programmes is on how to translate the concepts of child development into practical advice. As for nutrition, advice on how to stimulate psychomotor and social development needs to be adapted to the opportunities and possibilities of the local reality. Local medical and nursing schools should take a leading role here.

A final remarks is that all this training and reorientation will not be successful if the conditions of daily practice are not made more conducive for meeting and discussing with parents. As indicated by the interviewees, time availability is an important factor, but a reorientation in the assessment of health worker performance is probably a more important precondition. Measurements of performance should then use fewer indicators of coverage and more of patient satisfaction.

References

Introduction

The project “Hacia un Enfoque Integral de la Salud Infantil” (Towards an Integral Approach to Infant Health) taken place from 1999 to 2001 in Bolivia and Peru, supports itself on two affirmations: first, that the health of infants less than 5 years of age, not only depends on the technical quality of the health care providers but also on the knowledge and practices of the parents and caretakers; second, that the doctor/caretaker relations are always considered as interactive encounters between the two actors, even when one of them appear to have a passive attitude.

The research and intervention activities had two goals: 1) discover the knowledge and practices based on social representations and meanings that mothers, fathers and caretakers give to infant growth and development; 2) understand what was the logical framework of the social representations and meanings and how it influences the infant’s growth and development.

This presentation picks up the analysis of the main results in the research and intervention stages that occurred in Peru in two characteristic geographic and demographic areas of the Department of Lima: 1) marginal-urban; and 2) rural. The contacts with the mothers and caretakers were done through home visits where 125 in depth interviews were performed with a semi-structured interview guide; additionally, 12 focus groups were done. During the intervention phase, 5 monthly meetings took place for a 6
months period with a total of 100 mothers and caretakers who came from different areas in the districts of Carabayllo and Independencia, in groups of 15 to 20 caretakers.

It is neither our intention to do a description of the representations and meanings that the parents and caretakers have about the health of their children nor only report the practices that they develop in order to take care of their children. We are interested in sharing the reflections and thoughts that were elaborated, constructed through the constant dialogue with the caretakers and the lessons that we got out of this dialogue.

Context

In order to facilitate the understanding of these reflections, thoughts and lessons, we will describe briefly where the families live and what they do to survive. Independencia is a district since the mid 60’s, located in the periphery of the city of Lima. The constant battle of their inhabitants has accomplished an improvement in their living conditions such as roads, basic infrastructure, schools, etc., in the initially settled areas; while the areas that have recently been settled into, do not have these services. Commerce and small scale industry dominate the productive activities of the families and their income places them in the poverty socioeconomic stratum. In Carabayllo two rural areas were taken: Chocas and Rio Seco. In the former, families own small parcels of land for farming; and, eventual workers or day laborers, who work for these family owned agricultural parcels, live in the latter. The income that they obtain situates them in the poverty and extreme poverty strata, respectively. The majority of the housing is constructed with “adobe” and reed mats and do not have the basic services of water and sewage.

The origins, cultural heritage and acquired knowledge

The origin of the families varies. In Ermitaño some families are fourth generation residents of immigrant origin and very few are of recent immigration; while, in Chocas and Rio Seco, there are more families product of very recent immigration. Although all families have had some contact with the health care centres of the official public health care system, the acceptance of their norms and suggestions with respect to the care of the children, will vary according to whether they had more or less contact with these health services. The concepts and care suggested by the health
professionals not always become part of the caretakers’ conceptual and practical baggage, because, firstly, this new knowledge/wisdom does not necessarily unearth the ancestral knowledge/wisdom on this subject, and, secondly, because there are factors other than knowledge/wisdom that define the behaviour of the caretakers. An illustrative example of this could be the necessity of baptizing the child, as a protective element of his or her life, which could limit some practices of the psycho-motor development; but, that at the same time, it may also represent an economic strategy of survival for the child or the family. This is so because the godfather has, as an inherent responsibility, the care of the godson or goddaughter and of his or her family. The medical knowledge coexists without conflict with the caretakers’ knowledge or changes in terms of meaning in everyday practices as is in the case of the concept of “balanced diet”, which is perceived only as a dense diet without taking into consideration the quality of the food.

The more relevant components of the social representations and meanings with respect to health/disease and growth and development of infants less than 5 years old

The health - disease process

Defined by the caretakers’ observations of child’s changes in conduct, state of mind, in his or her appetite and also by the caretakers’ capacity to manage certain alterations and changes, without having to use external competencies or resources. This definition gives way to two concepts about health: a) “healthy” meaning happy, playful and with appetite; and b) “healthy but...” meaning the former but including some sings or symptoms of illness that can be managed at home. Lastly, “Disease” meaning when the signs and symptoms can not be treated at home. The child has to be treated by external healers (traditional or western).

The indicators of proper growth

Importance is not given to height with respect to age according to standardized measures. The comparison is made with respect to the parents themselves. “She or he can’t be tall if her or his parents are short”. The idea of genetic determinant over nutritional determinant. The weight has the same explanation; although, in this case there is a relationship with nutrition, but not in terms of quality but in quantity. “Doesn’t want to eat” or “Yes, he eats a lot”. In these and other explanations, we may note that what is dominant in the logic of the explanation is fundamentally the
relationship with what is “naturally” (biologically) before of what is
“socially” determined. The genetic component or the quantity of the
food is natural or rather biologic, while the nutritional quality is a
socially structured concept (accessibility).

Exclusive breastfeeding and weaning

While exclusive breastfeeding is not changed by the different
liquids that are given in small amounts, “agüitas”; it is so by the
work of the mother (day laborer who can not take the child to the
field). According to her, the weaning stars at 6 months and do not
consider as such the small amounts of adult food that is given from
2 to 3 months “because he wants it” (“porque se antoja”) or “so that
his stomach starts getting used to adult foods” (“para que su
estómago se vaya acostumbrando a la comida de los adultos”).
Prolonged breastfeeding for more than 2 years hide behind multiple
reasons that go from the mother being unconsciously opposed to
breaking the emotional and social dependency with the child – “poor
baby, I feel sad that he cries” (“pobrecito me da pena que llore”)– to
purely economic reasons – “so that he doesn’t cry of hunger” (“para
que no llore de hambre”) or “so that he gets stuffed because we don’t
eat at night” (“para que se llene, porque como nosotros no comemos
de noche”).

Acceptance or rejection of some foods

Fundamentally, economic factors (money or time) define the
meals (kinds and amounts of food) of a family. A general proof is
that except for the almost exclusive breastfeeding phase (without
the “agüitas”), the mothers do not prepare a different menu for the
children that are less than 5 years old. It is the adults’ potato or
spaghetti that becomes the mashed food (“papilla”) for the child
before teething. The adults’ meal is predominantly made up of
carbohydrates; so, for this reason, they justify the lack of foods rich
in proteins such as chicken or fish with explanations like it is
“harmful” for the child (in the case of chicken or fish). The first as
bad specifically for boys because the chicken has been bred with
hormones and may turn the boy into a girl. The second, of which is
accepted as having the trait for developing the intelligence of the
child, is dangerous when he or she has some wound. A more in
depth investigation led to the discovery that both foods are
expensive for the family or forces the mother to “spend” (“gastar”)
more time in preparing them.
The proposal of and experimentation with adequate foods for the child which are less expensive and are within available resources will be introduced permanently if the adults, specially mother, like them (the case of processed blood, “sangrecita”), if preparation does not demand too much time of caretaker or mother and if favourable results are visible in the short term.

The adequate stimulation and support for child development has its difficulties with respect to the psycho-motor, language and emotional aspects because of lack of time by the caretakers due to limitations of the context, predetermined ideas concerning gender and the importance of punishment, as an instrument of socialization. Even though all mothers know about some way of helping the muscular development of their children, they only do it when they have time. Some not so convenient customs or habits for the child such as tying up the hands or leaving them in a “walker” (“andador”) or a “little corral” (“corralito”) are explained as forms of helping the muscular development of the children; however, these hide the fact that in reality these are safety strategies that the mother utilizes, so that, she may do other activities while taking care of the child. The external conditions (soil floors, uneven terrain, etc.) turn these strategies into accident risk factors for the infant.

The communication and affection that the mother shows towards the child from before birth and during breastfeeding very rapidly turn into a dominance/ submission relationship after weaning or when another baby comes along. The support functions of socialization are rigorously carried out especially for the boys. These are explained as much by ideas about the need of authority, as by ideas about fearing the loss of manliness in the boys. These hide the fact that the child is seen dually by the parents; that is, he or she is a realization or fulfillment; but at the same time, an added workforce for the survival of the family.

The relation caretakers – health personnel is marked by a subordinate attitude by the caretakers making the communication and exchange difficult to happen. However, a change of attitude by the health personnel is not enough; what they needed to comprehend is the underlying rationality of the meanings and representations of the caretakers and their adaptation to the environmental, social and economic context.
Lessons

- We should consider the social representations and meanings of the caretakers as a complex product of: 1) the knowledge/wisdom passed down from generation to generation; 2) the time; 3) the intensity of the contact with the professional medical model; the economic factors; and 4) the time that the caretakers have to spend with the infant less than 5 years of age. The functions that are fulfilled by these social representations are: a) legitimates and guides their practices; and b) defines and justifies the selection of changes that are acceptable or considers possible. The capacity of change is possible to enhance if it is taken into consideration more than one element of those which contribute to the construction of this frame/web of meanings and representations.

- The central characteristic of the body of representations and meaning about child/infant health and growth and development is that of the adaptation of beliefs and knowledge to: 1) the concrete context; 2) the time available by the caretakers; 3) the availability of economic resources; and 4) the degree of credibility of the external informant.

- The forms and styles of child/infant health care have taken us to reflect very closely about how inadequate and even futile, may be the form of vertical health education that prioritizes the transference of knowledge rather than the discovery and exchange of knowledge/wisdom. They made visible to us the necessity of using health education approaches that improves the encounter of cultures of the different groups involved in the interaction and transaction within in a climate of respect and comprehension in order to guarantee the processes of change not only in the caretakers, but, in the health personnel. Hence, the instruments utilized by the health personnel, such as the “carné” (growth and development booklet/chart), may achieve its original objective.

- Finally, the research and intervention experience permits us to confirm that the same interdisciplinary exigency that should characterize the research phase in this subject, should be considered as indispensable in the intervention phase. The recommendations and actions that come exclusively from the health/medical sciences body of knowledge will not change the situation of these children because the problem is an
interdisciplinary/transdisciplinary one, but, even more so if the living conditions of the families are not changed. The element of success is in working with (not for or instead of) the caretakers in the possible changes and support their struggles for more integral changes.
LOCAL PERCEPTIONS OF CHILD’S HEALTH, GROWTH AND DEVELOPMENT AMONG BOLIVIAN MOTHERS

Charles-Édouard de Suremain1, Pierre Lefèvre2, Bernard Maire3, Patrick Kolsteren2

Introduction

The results presented in this paper proceed from an interdisciplinary research project that aims at developing and applying a global and comprehensive approach to the health of under fives in Bolivia and Peru. This is an INCO-DC research project financed by the European Community and entitled Health sector reform: towards a more global approach of child health [n° IC18-CT97-0249 (DG12-WRCA)]. In this project, the socio-anthropological, public health and nutrition components are complementary. However, only the results of the socio-anthropological research carried out in Bolivia are presented here (1-4) for other results of the socio-anthropological research conducted in this project; (5) regarding the multidisciplinary approach of the project. The results from Peru are presented in another paper of this same volume (6).

The aim of this socio-anthropological research was to understand the reference frameworks and practices of mothers in relation to child health, growth and development. This latter theme has been largely covered in psychological, psychoanalytical and psychopathological studies, but has seldomly been investigated in a socio-anthropological perspective (7-11). Our main hypothesis is that an in-depth understanding of the mothers’ perceptions and practices should lead to an improvement of the interventions targeted at the child within health care structures and populations (on similar perspectives (12)).

Our main research questions were the following: What does growth and development of children mean for mothers? What are their explanatory models for “normal” growth and development? What are the criteria they use to follow-up growth and development of their children?

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After clarifying the local conceptions of “healthy” and “unhealthy” children, we will show how the body -and its transformations- is a marker of the general health condition of the child. We will then focus on the perceived milestones for growth and development, insisting particularly on walking acquisition and the passage to adult food. Finally, we will conclude on the contribution of the socio-anthropological approach for reaching a comprehensive understanding of local perceptions on child’s health, growth and development.

Places of investigation and methodology

In Bolivia, the research was conducted in the urban periphery of Cochabamba (Chavez Rancho), the country’s third-biggest town, and in the amazonian and rural region of Chaparé. Both regions are inhabited by a majority of Quechua-Aymara Indians. Both groups represent round 40% of the Bolivian population (13).

In the socio-anthropological research, we used three investigation tools: semi-structured interviews, in-depth interviews and focus groups (see Table 1). The fieldwork had a total duration of seven months (14,15) regarding the justification and utilisation of these different investigation tools in the context of the project).

Results: Perceptions of health, growth and development

“Healthy” children vs. “unhealthy” children

In both contexts, Quechua-Aymara mothers use the notions of “growth” or “development”, or “health”. But these have very different meanings depending on the topics with which they are associated (environment, food, disease, gender, age).

Simultaneously, mothers use broad notions such as “healthy child” (niño sano) or “unhealthy child” (niño no sano) that allow to indicate more precisely the perceived contents of the notions of health, growth and development. These include physical and behaviour characteristics that the mothers spontaneously mention.

Changes in the general behaviour of the child (sleeping troubles, screams, excessive crying) are serious signs of “disease”. The fact that a child does not eat normally is also an important manifestation of a “disease”. If the child vomits it is a sign of severity, mostly because its physical appearance is altered (thinness, loose stomach skin). In these cases, mothers say that their child is “sick” (enfermo), without necessarily mentioning the disease in question:
Table 1: Semi-structured interviews, in-depth interviews and focus groups held with mothers of under-five children in Chaparé and Chavez Rancho

<table>
<thead>
<tr>
<th>Semi-structured interviews</th>
<th>Number</th>
<th>Places</th>
<th>Dates</th>
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<tbody>
<tr>
<td></td>
<td>117</td>
<td>Chaparé</td>
<td>Sept. 1998 to Feb. 1999</td>
</tr>
<tr>
<td></td>
<td>112</td>
<td>Chavez rancho</td>
<td>Sept. 1998 to Feb. 1999</td>
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<tr>
<td><strong>Total</strong></td>
<td>229</td>
<td></td>
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<tr>
<th>In-depth interviews</th>
<th>Number</th>
<th>Places</th>
<th>Dates</th>
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<tbody>
<tr>
<td></td>
<td>19</td>
<td>Chaparé</td>
<td>March 2000</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Chavez rancho</td>
<td>March 2000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<th>Focus Groups</th>
<th>Number</th>
<th>Places</th>
<th>Dates</th>
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<tbody>
<tr>
<td></td>
<td>4</td>
<td>Chaparé</td>
<td>Sept. 1998 / May 2000</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Chavez rancho</td>
<td>Dec. 1998 / May 2000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8</td>
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When he is sick, he does not want to play, he only wants to eat sweet things; and this means that he is not well (Chaparé).

By contrast, whatever its age, characteristics of a “healthy child” are that he is not sick, eats well, “moves”, plays and sleeps well. As a mother says:

When he is very chubby and he is happy, when he runs in all directions and is always joyful, and when he also does not complain much, that is because he is healthy (Chavez Rancho).

**The body as a marker of the child’s general condition**

The answers mothers give to the question: “How does a child that grows and develops well look like?” show that they regularly observe the body of their child. They spontaneously qualify him as “beautiful” (bonito or lindo), “good” (bueno), “fat” (gordo), “well-formed” (bien hecho), “joyful” (alegre) and of course as “healthy” (sano).

Data on the image that mothers themselves call a “beautiful well-formed body” (un buen cuerpo bien hecho) highlight a large homogeneity in the perceptions (16-20) on the anthropology of the
body). Summing them up, we can say that a “beautiful well-formed body” must be harmonious, tending to some corpulence that is well distributed all over the body. The child that develops normally does not have to be tall, but rather well proportioned. Contrarily to what is commonly said by mothers in Europe, and according to what D. Bonnet reports in another paper (21), its age is rarely connected with its weight and height (for complementary observations in other contexts (22,9).

As long as a child is neither too fat nor too thin, its growth and development are thought as harmonious.

In the perceptions of the “well-formed beautiful body”, the reference to the weight appears frequently but is rarely translated into kilos. Mothers “feel” or “see” when their child does not have a normal aspect. To them, the absence of disease combined with the harmonious distribution of weight all over the body is what certifies normal development. On the contrary, rare are the allusions to the children’s height, and even rarer to low height in relation to age.

*Body transformation factors*

**Illness episodes**

Among the specific diseases affecting the transformation of the child’s body, diarrhoea is frequently mentioned. Also, many mothers link the loss of appetite to malnutrition and anaemia, hesitating however on whether it is a cause or a consequence of loss of appetite. Bad growth is associated with loss or stagnation of the child’s weight, sometimes with a problem of height. Whatever the causes, fever is not only perceived as a real disease, but also as a disease provoking thinness.

Generally, mothers use biomedical notions (anaemia, malnutrition), giving them sometimes a very specific, and other times a very broad meaning, using them a little like categories in which one can put anything.

Children are not well when they have a severe disease, that is to say anaemia, or else diarrhoea, because they cannot eat; when they eat no food, they cannot develop (Chavez Rancho); [Children] eat neither food and they get it [anaemia] (Chaparé).

**Food practices**

For the mothers, poor nutrition -regarding quality as well as quantity- also has immediate consequences on a child’s health, and consequently on the transformation of its body.

To the question of whether there is a relation between a child’s nutrition and its growth, most of mothers assert that a good
diet implies good health and normal development. By contrast, a child receiving little good food shows physical signs that associate excessive thinness with weakness. The unhealthy child would be kind of “de-structured” in his feeding behaviour. This de-structuration may lead to what mothers call “malnutrition”.

**Other factors of body transformation**

To the question of whether the psychological state of the child has an influence on its development, answers remain extremely vague. A mother explains that psychological aspects, since they are not visible, do not "say" much, as opposed to body signs, especially the fact of growing.

*Main perceived stages of child’s growth and development*

When asked what are the decisive stages of child growth and development, few mothers mention motricity, increased attention, secondary movements or language acquisition. Contrary to this, most mothers clearly identified walking acquisition and consuming adult food as fundamental milestones in the development stages.

**Walking acquisition**

In the local perceptions, walking acquisition (between eight months and one year) is not preceded by the phase of crawling. Mothers particularly apprehend this very phase when the child is at risk to get infections or to hurt himself. To avoid these risks, it seems that women absolutely want to speed up the walking process by introducing very firm incentives.

He did not walk upon all fours; none [of my girls] has ever walked upon all fours; they went from the sitting position to the standing position to walk; they never crawled; my oldest girl had her walker and she used to walk only with it; the other one was sitting on her chair, but I never put her on the floor (Chaparé).

In practice, women carry the children on their back, wrapped in local woven cloth. When it is no longer possible, they leave them in baby-walkers so that they can stand up and be at their reach.

**Transition to adult food**

Transition to adult food is also perceived as a major milestone of child development.

According to observations, dietary supplements or adult foods are introduced from the age of 3 months or even sooner. Mothers also prepare the dishes cooked for the adults in a suitable way for the children, but they seldom cook specific dishes for them.
some children, already when they are two-month-old, when they see what we are eating [we give them soup] (Chaparé).

Well, [my child eats] only what we eat: rice, noodles, noodle soup with egg, that's it (Chaparé).

Data shows that definitive weaning occurs between the ninth and the twentieth month and in a rather abrupt way. The appearance of the teeth is sometimes decisive for definitive weaning. But mostly, following the advice from their own mothers or mothers-in-law, mothers apply salted substances on their nipples to speed up the weaning. Some women leave their child over night at their mother's place so that the end of the phase be well marked (23-27) on similar practices in Africa).

These weaning practices could be connected to the very firm incentives concerning the walking acquisition. The apparent aim seems to render the child autonomous regarding food, in other words to socialize him as early as possible.

*The mothers’ reference framework*

Based on all these elements, we can assert that walking acquisition and passage to adult food are fundamental milestones of child growth and development. The passage of these two milestones -without negative consequences on the “beautiful well-formed body”- is decisive for the mothers to say that their child’s growth and development is “good” or “bad”.

Figure 1 summarizes the perceived causal linkages between the topics predominating the local perceptions and aims to replace growth and development milestones in a more global comprehensive framework.

*Figure 1: The mothers’ reference framework on child’s growth and development*
These perceptions and links form the mothers’ reference framework are expressed in the “beautiful well-formed body”. They give sense to the child’s health, growth and development, as well as to the food and health-care practices associated with it.

Judging by our results, Quechua and Aymara mothers clearly have a different perception of children’s well being than the biomedical model underlying monitoring activities in health centres. To them, measuring height and weighing are not prioritized expectations and do not correspond to their demand. There is a deep inadequacy between their vision and the technical viewpoint of the health professionals, as it has also been said in P. Lefèvre’s paper (28).

As a general rule, the biomedical vision of occidental inspiration tends to fraction reality and health interventions targeted towards the child (psychomotor development, nutrition, health prevention, curative care, and so on). On the contrary, the data presented here emphasize the necessity to adopt a global and comprehensive approach towards child health that takes into account local reference frameworks. Since a global approach on
child health integrates biomedical objectives and lay reference frameworks, it must allow narrowing the gap between logic of action and thinking that are very different from each other.

The necessity to adopt a global approach on child’s health explains why we prefer not to refer to some kind of “nutritional” or “medical” anthropology. For us, socio-anthropology does not consist of a specialized branch of nutritional or medical sciences which purpose would only be to assist these disciplines in resolving technical problems. The contributions of socio-anthropology go much further.

As a matter of fact, this contribution appears to be particularly well adapted to highlight the rationality, the syncretic and complex character of local perceptions and practices (examples of such integrated vision (29-36). At a more general level, if it is applied within a participatory action-research framework, the socio-anthropological approach can provide new coherency where some actors do not see any and concretely contribute to the improvement of child's health (37,38) on participatory action-research).

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APPROPRIATION OF THE GROWTH CHART BY MOTHERS OF UNDER FIVES IN BOLIVIA

Pierre Lefèvre¹, Tom Hoerée¹, Edgar Sejas², Charles-Edouard de Suremain³, Edgar Zambrana⁴

Introduction

International agencies, governments and NGO’s promote the growth chart as an essential tool of GMP programmes. The underlying assumption is that the use of the growth chart could facilitate the communication between health workers and caretakers on the nature of growth and development and on the consequences for the child of an incorrect or inadequate diet. Through GMP, health services also want to follow-up children to detect early malnutrition.

However in the scientific literature, the relevance and usefulness of the growth chart is regularly questioned (1-3). These doubts are, on the one hand, technical (sensibility, sensitivity predictive value). On the other hand it has often been reported that mothers do not understand the growth chart very well (4-6). In a recent paper, D. Morley (7) stated that the tool is difficult to use and understand by the mothers and he proposes a new tool as a solution. The usual explanation is illiteracy but is it really a question of capability to understand or is it rather a question of appropriation and interest? In other words are the mothers interested to follow-up the growth and development of their child using this specific tool?

Understanding and utilization of the growth chart by caretakers is however a central issue to reach this objective. In order to respond to this question different studies were undertaken, some of which are presented in this volume (8,9).

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The objective of the study presented here was to understand how mothers perceive the use and utility of the growth chart in Bolivia. Indeed little information exists on the perception of this tool by caretakers.

Our main research questions were the following:
What does the health card mean for the mothers?
Do they understand its objective and use?
Do they use it? For which purpose? How?
How do mothers understand the concept of growth monitoring?
Is the health card an instrument that facilitates communication and dialogue between health personnel and caretakers?

Material and methods

In order to answer these questions focus group research (10-12) was conducted.

In May 2000, four focus groups were organized in the peri-urban zone of Cochabamba (Chavez Rancho and San Juan XXIII) and in the rural amazonian region of Chapare (Puerto Aurora and Puerto Cochabamba). Both regions are inhabited by a majority of Quechua-Aymara Indians. These two groups represent round 40% of the Bolivian population (13).

Participants were mothers of under-fives. The research team identified participants. The groups were relatively homogeneous in terms of the mothers socio-economic background. In the peri-urban zone, the 2 groups were however contrasted in terms of educational level. The mothers from San Juan XXIII had a higher educational level than those of Chavez Rancho.

A researcher from the University Mayor de San Simón of Cochabamba did the facilitation of the focus group discussions. He was selected for his knowledge of the Quecha language and his animation skills. On average, 15 mothers attended the groups. Examples of the last version of the health card of the Ministry of Health were shown to the mothers at the onset of the discussions.

All focus groups were tape-recorded. Data was translated from Quechua or Spanish in French and codified and analyzed with the support of the QSR Nudist version 4.0 software in ITM. A preliminary data analysis benefited from the comments of the three other researchers involved.
Results

1. Mothers’ perceptions and reported use of the health card

1.1. General perception

At the onset of the focus group discussions, when a health card was introduced to the participants, the spontaneously referred to it as a vaccination card.

"[The nurses] call it the vaccination card; We do not know another name for it. [FG1 ; 81-82]
When we go to the doctor, they say: “And his vaccination card?“ [fg1 ; 86-89]"

This designation has to be related to the practical and main use of the health card made by the mothers and the health personnel that is the control of the vaccination schedule (see 1.3 and 2. below).

Data analysis also reveals that mothers consider the health card as an important document. They store them in envelopes or plastic bags and keep it in a safe place in the house with other important papers.

1.2. Mother’s understanding of the health card objectives

Mothers do understand the monitoring objectives of the health card. For them, the card is to be used to control and follow-up the vaccinations, the weight and to a lesser extent the height of the children. They spontaneously mention the measurement of weight and height.

"To control the weight, of his vaccines, of his growth, for all that. [FG1; 230-231]"

"When the child is not (well) nourished, he falls sick, he weights less... He looses two kilos, one kilo or half a kilo. This is how to control. It’s because he has to eat well. Sometimes he will loose weight or gain weight. This is how we see how he develops and grows. [FG3 ; 169]"

Mothers express interest and expectations in the growth curve and do understand its growth monitoring purpose, although, as we will see, they do not use it for this. For some mothers, partly related to their educational background, understanding the growth curve however still is a problem. Participants from the focus Group of Juan XXIII had a better understanding of the growth curve.
It would be good that they explain us a bit more on this subject, because many among us, we say that we know, but in reality, we do not understand the use of all these lines and curves, why they go up or why they go down... [FG3 ; 214]

What might be more important is that mothers express interest and expectations in the growth and development of their children. They would like to better understand

1.3. Mother's reported use of the health cards

Mothers say they use the health card for two main reasons: vaccination of the child and in the case of illness episodes to have access to care.

We only use it when we have to have the baby vaccinated. [FG3 ; 220]
I think of it for myself for instance as a certificate, if I do not show it, they won't attend to me. [FG1 ; 235-237]

The practical use of the card as an “aide-memoire” for the follow-up of the vaccination schedule was often mentioned:

At what moment we have to bring him to the doctor, when we have to go for the vaccine. They even give us dates, so with this we know when we have to go.. [FG2 ; 242]

According to the data, mothers do not seem to make a different use of the card for girls or boys. However the rank of the child in the family influences the use of the card. Mothers give much more importance to the health card of their first child.

Mothers report using the health card mainly the first year. This has to be related to its use for following-up the vaccination schedule.

In addition to the uses reported above, the health card has other utilities. Indeed, in Bolivia the card is also needed to enroll the children in school. Some mothers mention that they keep the card as a souvenir for their children later.

Very few mothers mentioned using the health card to follow-up growth and development of their children.

2. Use by the health personnel as reported by the mothers

The data gives profound insights on how the health personnel uses the health card. These results are in line with results presented elsewhere in this volume (8,9).
Mothers report that the health personnel mainly uses the health card as an administrative tool for following up the children’s vaccination status, registering them at the clinic, and for allowing access to care whether it be preventive or curative.

*The only thing he told me is that I should bring the card with me, that it serves to note down the dates of the vaccinations, the weight of the child and nothing else. He told me not to loose it as it is for his control. This, he told me the first time.* [FG2 ; 361-365]

*Here I follow the vaccinations, they gave it to me for that.* [FG3 ; 47]

*We take out the card only for having the children vaccinated and thereafter we put it away again. And when we have to go to the hospital, we take it out again and secure it again afterwards.* [FG4 ; 568]

*Just until he finished his vaccinations and thereafter, nobody asked for it anymore.* [fg4 ; 270]

For the health personnel, the growth monitoring purpose is secondary. Few explanations are provided to the mothers regarding the information recorded on the growth chart. Interpretation of the chart, if any, is made by the health personnel.

A number of mothers complain that the personnel does not systematically plot the weight and height of the children on the curve.

*We always did more or less what the doctor told us to do, but not while looking at the health card, saying “right, he is already here, this is the moment to start giving baby foods”. No, not while looking at these [illustrations], but always while listening to the doctor, what he tells us, because, without doubt, he did not explain us the importance of these illustrations.* [FG 1 ; 355]

Rude attitudes and poor communication skills of health personnel, as illustrated by the following quote, further hamper provision of information:

"*How, madam, didn’t you take it [the card] along?*, …like this, they tell us of … then they open their mouth. Generally for telling us of, they are the first ones, but for giving us a good advice, that, that is rare, my good man.* [FG 1 ; 776-780]
Discussion and conclusions

Although mothers express interest in matters related to growth and development of their children, they do not appropriate the growth chart as a tool for the follow-up. As such the card misses its health monitoring purpose and does not fulfil its role as a communication device between caretakers and health personnel.

The limited appropriation of the growth chart by the mothers seems to be partially induced by the health services themselves.

Three factors appear to play a major role in this limited appropriation of the tool by the mothers: a) the improper use and understanding of the chart by the health personnel; b) the lack of explanations provided to the mothers by the same personnel in relation with poor communicational attitudes.

In addition, as shown in an other paper in this volume (14), mothers rely on their own criteria to follow-up the growth and development of their children.

The study also indicates that the value of the growth curve can not be studied in itself, intrinsically and has to be considered in the more global context of the functioning of the first line health services. In the Bolivian context, improving the understanding of the growth chart by the health personnel, and more importantly, changing their attitudes and improving their communication skills is a pre requisite to any work on growth monitoring programmes.

Acknowledgements

The results presented in this paper proceed from an interdisciplinary research project that aims at developing and applying a global and comprehensive approach to the health of under fives in Bolivia and Peru. This is an INCO-DC research project financed by the European Community and entitled Health sector reform: towards a more global approach of child health [n° IC18-CT97-0249 (DG12-WRCA)].

References


IS FORMAL SCREENING MORE EFFECTIVE THAN TRUSTING MOTHERS’ FEELING?

René Tonglet

Introduction

Formal screening for a lot of health problems is a standard component of any community child health service. Screening involves testing of apparently healthy children, to separate a group of subjects who are at high risk from a larger group who are at low risk. In most developing countries, growth monitoring (GM) is indeed promoted as a formal screening tool for under-fives, devoting very much time and effort; GM has however become controversial. Although it is perceived by some as the cornerstone of the so-called child survival revolution, to others it is an ineffective ritual (1-7). My personal experience over the last ten years of promoting healthy growth has taught me that the current policy of GM in developing countries is indeed questionable, and that alternative strategies should be considered for giving more attention to both the mother and the health worker on duty at the under-fives clinic. This paper aims to add value to such alternative strategies.

Absence of evidence, evidence of absence

It is well know that very low values of anthropometric indicators are associated with a high risk of mortality, as well as with a high incidence or a long duration of diarrhoea and other diseases among children (8-10). Severely malnourished children experience high rates of morbidity and mortality, and severe protein-energy malnutrition (PEM) is an indicator of bad prognosis particularly for children admitted to hospital (11,12).

However, there is no research evidence of the value of nutritional anthropometry as a tool for the early identification of the child in need, and the precise nature of the association between moderate malnutrition - i.e. growth retardation affecting millions of children world-wide - and child's health is hardly clear (13). Among the studies, which have addressed the issue of avoidable death, two provided promising results from Asia (14,15), but three collected

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weak evidence from Africa (16-18). In addition, none of these studies has provided documentation that nutritional anthropometry would succeed in identifying children with a high risk of morbidity, despite the policy importance of such an issue.

In view of the accumulated results from the large number of available studies, current policies of routine growth monitoring appear to be based on yet unproven opinions and beliefs. Recently, David Hall (19) has reported that a group who met in Coventry, in 1998, to develop a consensus on growth monitoring did agree that growth monitoring was not performing well against the classic requirements for screening programmes. According to the conclusions of this meeting, routine growth monitoring should not be regarded as an effective screening tool, and has no proven benefits.

So far, this lack of evidence goes together with a very limited attention given to other possible screening tools and a very limited research agenda on alternative strategies to promote healthy growth. Interestingly, this has been clearly underlined into a Cochrane review by Panpanich and Garner (20). In this review, ten studies were identified for inclusion, but only two trials actually met the selection criteria, and only one really succeeded in assessing the impact of routine growth monitoring as compared with no growth monitoring. According to the reviewers’ comments it is indeed surprising that there is so little research evaluating benefits and harms of growth promotion interventions.

News from the field

Unproven opinions and beliefs are useless for preventive medicine. We need facts. So, let me now consider the factual information that can be gained from three very different studies.

The first one is the only trial included into the review already mentioned. This study, conducted by George (21) in India, randomly allocated six pairs of villages to receive or not routine growth monitoring. About 550 under-fives were studied in the two groups, and, after 30 months of intervention, no difference in mean weight or height was detected.

This suggests that in a situation where the primary health care (PHC) system is functioning, GM provides no additional benefit as judged by anthropometry.

The second study I wish to point out has been carried out in rural central Africa (22-24). This cohort study involved 842 children under two years of age who completed weekly follow-up interviews and health examinations during three months. The main objective
of this study was to evaluate the value of clinical, biological, anthropometric and dietary measurements as prognosis indicators of short-term morbidity among apparently healthy children. This study demonstrated that anthropometric indicators performed badly in predicting morbidity, and that, in contrast, other variables that were seldom controlled in previous studies appeared to be valuable prognostic indices for subsequent morbidity. Among these predictors three appeared to be particularly relevant: the information gained from the caretaker – i.e. the mother – on the adequacy of the growth of the child («do you think your child is growing well?»), on the current child’s diet («how do you currently feed your child?»), and the occurrence of a morbidity episode during the preceding month («has your child been sick since the last visit?»). First, it is worth noting the accuracy of caretakers’ responses to questions regarding the adequacy of the growth of their children. Growth failure is certainly among the health needs that are perceived by the caretakers. Next, it is useful to direct our attention on the feeding practices declared by the caretaker. The beneficial effects of exclusive breast-feeding are well known, but the detrimental effect of early weaning and long-lasting inadequate supplementation should not be overlooked. Finally, there is clear evidence that a child who suffers an episode of disease in the month preceding any observation period is more likely to become sick over the subsequent interval, as well as to experience growth failure. Careful recording of the medical history of the child at each encounter appears to be of utmost importance for the identification of the child in need.

For example, table 1 displays the logistic model fitted to the data on diarrhoea under 9 months of age. The dependent variable was the occurrence of at least one episode of diarrhoea by one-month interval. The independent variables selected by stepwise regression were as follows: incremental height, child’s diet, and occurrence of diarrhoea during the preceding month. Among older children, the set of predictors included: age of the child, time of enrolment into the study, adequate growth as judged by the caretaker, incremental weight for age, child’s diet, and occurrence of diarrhoea during the preceding month. Similar figures were obtained for malaria and respiratory illnesses. Clearly, most growth indicators were removed from the adjusted models.

We concluded from this study that in the tool-box they are many tools to find the child in need, and that among these tools the information gained from the mothers is usually more relevant than biometry.
The third study I would like to mention has been conducted in urban Burkina Faso (25). Detailed results of this study were presented during session five of this colloquium (26). The purpose of this study was to evaluate the effectiveness of a new model of child health care as compared with the standard one. In this view, more than 1000 newly registered under-fives were randomly allocated into two groups, and they were followed-up to the age of 12 months. The new model of care included integration of curative and preventive services, attention given to mothers’ feeling, and autonomy in health-worker decision making.

In the intervention group, we observed that the health-worker was really more committed to the patient, agreed most often with the mother when rating the health status of the child, performed less formal screening, and took initiatives to adapt the package of activities to the current health status of the child. As a result of this renewed approach, we observed a better survival and a better height growth in the intervention arm of the trial. Table 2 displays the Cox model comparing survival of the children in the two groups. It appears that children in the intervention group had a better survival at each moment during the follow-up. The computed hazard ratio of death was 0.56, corresponding to a relative risk reduction of 44%.

We concluded from this study that a renewed organization of child health care could have an impact on “hard” endpoints such as premature death or stunting.

Table 1: Kivu study. Factors related to odds of experiencing at least one episode of diarrhoea per one-month interval, for children aged < 9 mo and ≥ 9 mo. (From Tonglet et al. 1999 (21)).

Adjusted odds ratios from multiple logistic regression, which included the six anthropometric indicators of interest, age group, sex, time of enrolment into the study, judgement passed by the care-taker on the adequacy of the growth of the child at start of interval, child’s diet at start of interval, and occurrence of the disease under scrutiny during the preceding interval. Wald test.
<table>
<thead>
<tr>
<th>Number of OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of 1-mo intervals</td>
<td>of episodes</td>
</tr>
</tbody>
</table>

### < 9 mo of age

#### Incremental height for age (centile)
- **< 25th** 114 38 1.49 (0.94-2.05) 0.15
- **25th-49th** 108 26 1.42 (0.86-1.97) 0.22
- **50th-74th** 108 36 0.75 (0.18-1.31) 0.31
- **> 75th** 117 31 1.00

#### Child's diet
- **breast feeding** 185 63 1.00
- **partial weaning** 262 139 2.03 (1.62-2.44) <0.001

#### Diarrhoea during the preceding month
- **yes** 193 119 3.02 (2.62-3.42) <0.001
- **no** 254 83 1.00

### ≥ 9 mo of age

#### Age at start of interval (mo)
- **9-14** 384 184 1.00
- **15-20** 328 130 0.80 (0.49-1.11) 0.16
- **21-26** 219 56 0.45 (0.07-0.84) <0.001

#### Time of enrolment into the study
- **April 89** 284 97 1.00
- **July 89** 222 82 0.96 (0.57-1.34) 0.83
- **October 89** 217 102 1.58 (1.20-1.96) 0.02
- **January 90** 203 89 1.29 (0.90-1.69) 0.20

#### Adequate growth as judged by the care-taker
- **yes** 736 267 1.00
- **no** 194 102 1.56 (1.22-1.90) 0.01

#### Incremental weight for age (centile)
- **< 25th** 238 103 1.50 (1.10-1.89) 0.04
- **25th-49th** 227 96 1.61 (1.21-2.01) 0.02
- **50th-74th** 237 97 1.49 (0.71-2.26) 0.05
- **> 75th** 229 74 1.00

#### Child's diet
- **Partial weaning** 609 282 1.92 (1.20-5.00) <0.001
- **Complete weaning** 322 88 1.00

#### Diarrhoea during the preceding month
- **yes** 414 213 1.65 (1.36-1.93) <0.001
- **no** 517 157 1.00
Table 2: Ouagadougou study. Cox proportional hazard model comparing children in the intervention group with those in the reference group. (From 25,26).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>n</th>
<th>Réf</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Birthplace</td>
<td>home</td>
<td>34</td>
<td>Réf</td>
<td></td>
</tr>
<tr>
<td></td>
<td>medical centre</td>
<td>768 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>321</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Death of a child &lt;5y</td>
<td>=&gt; 2</td>
<td>70</td>
<td>Réf</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 2</td>
<td>1053</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observations

- Cases: 1120
- Events: 36
- Censored: 1184 (96,8%)

<table>
<thead>
<tr>
<th>Variables</th>
<th>HR</th>
<th>95% CI</th>
<th>P (Wald)</th>
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<tr>
<td>Group</td>
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<td>0,27-1,06</td>
<td>0,08</td>
</tr>
<tr>
<td>Birthplace (1)</td>
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<td>0,08-0,91</td>
<td>0,03</td>
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<td>Birthplace (2)</td>
<td>0,55</td>
<td>0,16-1,91</td>
<td>0,35</td>
</tr>
<tr>
<td>death of a child &lt;5y</td>
<td>0,32</td>
<td>0,13-0,76</td>
<td>0,01</td>
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</tbody>
</table>

Accountability in child health care: please, ask the mother!

So what?

I think that empirical and theoretical evidence support the view that some things are wrong with routine growth monitoring and promotion. Many share a too simple faith in the effectiveness of what appears to be a ritual: “it works whatever the quality of the health system may be”. Too often, the health-worker is the only person to deserve attention: “the HW knows better, the mother has to complain and to comply”. As an almost universal practice, growth monitoring is a technology-driven activity: “the HW has no autonomy in decision-making, standard procedures are mandatory”.

Therefore, what should we do?

Firstly, the lesson learned from the study by George is that GM is as good as the health care system is good. Thereby, reinforcement of primary health services should be placed on the very top of the agenda. The priority is to care for the child as a person, either healthy or sick. It is not to perform formal check-up or to manage a short list of childhood illnesses (27).

Secondly, the lesson learned from the Kivu is that caring for the child requires giving value to mothers’ feeling. Health-workers should be encouraged to strength patient-centredness in place of
offering technical solution without expecting anything more than compliance. The message directed to the health-workers should be: “Please, ask the mother”.

Finally, the lesson learned from the trial in Ouagadougou is that we should recognize that the place of decision is within the patient-doctor relationship. In order to add value to growth monitoring and promotion, we should give value to health-workers’ competencies.

The message could be: “Please, ask the health-worker about his opinion on the way to care for the child in charge, and let him participate to the decision”.

These are my recommendations for discussion.

References


IS GROWTH AND DEVELOPMENT MONITORING IN CHILDREN REALLY USEFUL?

David Hall

This paper considers the role of growth monitoring and of developmental screening from the UK perspective, explains why the emphasis has shifted to primary prevention and health promotion and outlines the mechanisms for delivery. While the policy decisions are probably related to the political climate and cultural views of each country, the principles that have emerged are probably universally relevant. The paper draws on earlier reviews in journals and books.

Growth monitoring

Most health professionals, both in industrialized nations and in the developing world, support the routine measurement of height, weight and head circumference. Nevertheless, there is still disagreement about the objectives, the benefits, the ages when measurements should be made and the threshold for intervention or referral. These questions have been examined in a series of working parties in the UK since 1986.

Interpretation of growth measurements requires skill and judgement, and is easier when several measurements are taken over a period of time. With the possible exception of single height measurements, weighing and measuring children cannot be regarded as screening and we prefer the term "growth monitoring" (GM). Both screening and monitoring can be harmful. It is important not to overlook children with growth disturbances or disorders, but equally it is unethical to identify problems for which no intervention resources exist. Inappropriate referrals generate parental anxiety and a substantial increase in specialist workload.

GM in developing nations generally focuses on weight rather than height measurement and is often directed primarily at the problems of malnutrition. Although its value seemed self-evident for many years, Gerein and Shanti Ghosh are among the distinguished authors who challenged the underlying assumptions several years ago. More recently, a systematic review found little evidence that GM has any significant impact on the health of children in the developing world. The reasons for this finding

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probably include: incomplete coverage - the families whose children might benefit most from growth monitoring are those with multiple social and economic problems, who have difficulty in making full use of preventive health care measures; inaccurate weighing, charting and interpretation; rushed or inaccurate counselling of parents, due to inadequate staff training; poverty - lack of money and/or social support enabling parents to implement the advice given; cultural resistance to particular dietary recommendations.

Steady weight gain is a sign of good health, but the interpretation of growth charts is difficult. Babies do not all gain weight along the lines shown on the centile charts. Weight gain patterns vary in the first year of life, and this must be understood in order to avoid mistaken diagnoses of failure to thrive. The phenomenon of regression to the mean states that on average small babies (below the 50th centile at birth) will catch up (i.e. their growth line will get closer to the 50th centile), while big babies will catch down. Using the UK 1990 9-centile charts which have been widely accepted both for population and for clinical use, in which one centile channel is equal to 0.67 or two thirds of a standard deviation, experience shows that one baby in 20 will cross 2 centile channels downwards and one in 100 will cross three channels.

These channel-crossing babies may have a disease or may be under-nourished – or it is possible that there are other factors that explain these observations. Wright found that a simple health visitor (community nurse) intervention would facilitate weight gain; but Rudolf and Raynor had less success. They did however document the extraordinary range of parent behaviour at meal times.

We have concluded that weighing babies can be beneficial if it part of an intelligent responsive approach to supportive health care for families, but is wasteful and probably harmful if the staff involved are not well trained – not only in the mathematics of charts but in nutrition, feeding, infant behaviour and family relationships.

In the UK, we have found no evidence to support routine monitoring of length, though of course this is a part of routine clinical practice whenever one is concerned about a child and is also part of clinical assessment when a child presents with a problem.

Similarly, gain in height is a valuable marker of health, but monitoring height over time is fraught with difficulties. Inaccuracies in equipment and in plotting on the chart, variations in measuring technique, true short and long term variability in growth rates and the effects of short term illness all contribute to the difficulty of identifying the child with genuinely abnormal growth. While the debate continues, our current view is that a
single height measurement at five will detect most children meeting 2 criteria relevant to screening – asymptomatic except for short stature, and likely to benefit from treatment. The conditions that meet these criteria are isolated growth hormone deficiency and Turner’s syndrome. We doubt whether growth monitoring is likely on its own to detect psychosocial short stature and it is unlikely to be the best way of achieving this goal. However, it is true that measurements taken in the past may be useful when trying to assess current status.

In industrialized nations, we have anxieties about poor weight gain, due to under-nutrition or psychosocial deprivation, in the first year of life, but these are followed in mid-childhood by increasing concerns about the emerging epidemic of obesity. Our intention is to monitor Body Mass Index – but as a public health marker rather than for use in clinical care. While under-nutrition is the well-recognized threat in the developing world, obesity is fast becoming a bigger problem even in poor nations.

Development

There is good evidence that most children with serious disabling and handicapping conditions are detected by a range of means, but screening makes little contribution. In the developing world, the situation may be different, in that conditions like mental handicap (learning disability), deafness or autism may not be differentiated or even recognized as being abnormal. However, in most settings, one of the fundamental criteria of the original Wilson and Jungner analysis of screening is not met – namely, the crucial importance of a clinical service that can meet the needs of the children who would be detected by screening.

Screening might be more useful in finding children with mild or borderline delays in learning, language or motor development. The literature suggests that it performs poorly in this task. Many children are missed and this is not surprising because the early rate of development is not a very powerful predictor of later IQ. Those children who fail a screen but pass detailed assessment may have a worse outcome than those who pass the screen. This also is not surprising, because developmental abilities are a continuum – there is no clear division between “normal” and “slow” children’s intelligence.

We have not totally rejected the need for developmental screening but we judge that the tide of evidence runs against it and we doubt if it is the best way to use resources. Parents value the chance to take stock of their child’s progress with the help of a
trained professional and when there is doubt or uncertainty a
developmental test may be useful – but the starting point is
negotiation and mutual agreement as to what the issues are.

Primary prevention

Whereas there is little reason to be enthusiastic about
screening, there is more reason for optimism in prevention. Leaving
aside the attack on poverty, there is good evidence that certain
styles of parent–professional interaction are more effective than
others; that language development and literacy can be accelerated;
that parents can change their children’s behaviour; and that
communities are important as well as individuals. These insights
combine in the UK Government programme – “SureStart”.

Conclusion

Growth monitoring is of uncertain value. It is important to
ensure that it does no harm; that its assumptions and objectives
are explicit; that those objectives are relevant to the problems of
that particular society; and that there is no better way to address
those problems.

Developmental screening is probably less useful than the
promotion of child development. The evidence supports current
initiatives to change children’s life course.

References

This material is derived from the draft 4th edition of “Health
for all children”. This will be available (together with references to
the authors quoted) on:

www.health-for-all-children.co.uk

Pending publication in April or May 2002.

Previous editions:
UNDER-FIVES’ CLINIC : AN OBLIGATION TO CHANGE THE PARADIGM

Paul Bossyns

Introduction

In Niger, as in most other African countries, twice a week at least, all health centres of the nation spend the essence of their daily duty in the under-fives’ clinic. During these clinics, at least 70 % of the time is consumed by the act of weighing children. If one spends so much time (20 %) on one single act, it must be really worthwhile.

But where is the evidence?

In a poor country like Niger, where famine is a real risk and food production shows a deficit nation-wide every year, health centres diagnose severe malnutrition for 0 to 6 % of all children. Virtually none of these children are referred to a hospital environment for treatment. In one survey it was noted that congenital malformation was more frequently referred from the health centres to the district hospitals than children suffering from malnutrition. Among the few children that are followed up more intensively at the health centre level for malnutrition, half the mothers ‘abandon’ treatment before cure. Clearly credibility is at stake. Moreover, if we can believe the national health information system, the mortality rate for malnutrition is virtually zero, childhood tuberculosis non-existent...

If this is the best performance possible in the field, why would we continue?

The above brief description of field reality is not at all exceptional for sub-Saharan Africa. This paper will try in a first part to analyze why performance of the under fives’ clinic is so poor. In a second part we will try to build up a concept that might give an alternative view on the problem of malnutrition and a renewed search for appropriate answers.

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Why is performance so low?

_problems of identification_

Often, the identification of malnutrition constitutes a major issue for nutritionists. All kinds of scales and norms are being applied. Though not exempted from criticism as well (1), the most accurate and objective means to identify malnutrition for the moment is probably the weight for length measure, indicating the number of standard deviations a child is deviating from the norm. Niger has introduced this approach already some years ago under the watchword “The more precise the identification, the better the programme”.

From an operational point of view, the solution became one of the major problems. Weighing a child is one thing, taking its length another. Measuring the height of a child is time consuming, reason enough for health staff with limited motivation not to do it (correctly). Moreover, most children, -and their mothers-, do not like it because they feel they are being taken prisoner when the mother holds the head and the health worker the legs. Because the method is time consuming, Niger has adapted the policy to measuring the length only for children with the weight under the third percentile. This obliges health staff to fill in a weight – age curve as well, which makes the method even more time consuming, and declares by definition all children above the third percentile not to suffer from malnutrition. This obviously leads to situations where visibly malnourished children are said to be normal, whereas naturally small children or children with stunting are measured every month and declared normal. The field translation of a very scientific approach makes the latter counter-productive.

The second inconvenience of this approach is the fact that the evolution of the child’s weight is not being followed which leads to late diagnosis, and a much more complicated intervention. It likewise does not encourage the development of a continuous dialogue with the patient.

Thirdly, by creating under-fives’ clinics, the weighing act has shifted from a sick population towards an a priori healthy population of children. In other words, the diagnosis of malnutrition has been separated from curative services, where the prevalence is much higher and motivation of the parents is more important as well because they have already recognized a problem. If we regard ‘weighing’ as a test applied to a certain population, we know that the prevalence of the problem largely determines sensitivity and specificity of the test, hence its usefulness.
Underlying reasons for malnutrition

Where is malnutrition coming from? What are the reasons underlying the diagnosis? The standard answer in textbooks, known by most health workers is represented by the vicious cycle of infection and nutritional status, aggravated by socio-economic factors, read poverty. But when it comes to the operational level, in a country such as Niger, malnutrition is reduced to a 'food problem only', an attitude which is reinforced by the fact that malnutrition is being diagnosed during a preventive clinic and hardly ever during curative service. Or, as some doctors in Niger declare: "No, this is not malnutrition, this is a pneumonia case". Or the staff at the health centre, when asked why they did not notice the malnutrition of the child who presented with bronchitis: "It is not that I didn't notice the malnutrition, but this is not the under-fives' clinic".

The evolution of weight gain over time is rarely actively used in diagnostic procedures of malnutrition because growth charts are rarely filled out properly and even more seldom interpreted, one of the major reasons being the widespread confusion still reigning in the field that children under the third percentile are malnourished and those above are not. Hence diagnosis is often late, causing health workers to run behind a difficult problem instead of avoiding one. The determinantal events underlying malnutrition are often situated in the past well before the moment of diagnosis. What is the message one can still give to a mother with a malnourished child, who was suddenly weaned 6 months ago? What could have been a 'simple' advice at the moment the growth curve of the child started changing, has become a major problem.

Even if health workers would try to take into account biological factors determining the nutritional status of a child, the diagnosis is still reduced to a simple cause-effect logic. How to explain that during the drought year of 1991, when Zimbabwe massively distributed food, malnutrition was still 3 % of all children, exactly the figure of before the famine period? As a reaction to this observation, some local nutritionists demanded that still more important amounts of food should be distributed. There must be more to it. It looks as if Zimbabwean society is creating 3 % of children to be severely undernourished, whether the harvest was good or bad (we are excluding stunting). Malnutrition rates seem to be 'structural', or in other words, as long as we do not change the system, 3 % of children will remain malnourished. The question is, what system and what structure are we talking about? This will be tackled further on.
Advice and treatment that accuse but don’t explain

False diagnosis must lead to incorrect solutions. The direct connection made between malnutrition and food and food taboos is resulting in standardized and oversimplified solutions. In Niger, malnourished children are inevitably referred to food demonstration sessions where mothers are educated in ‘how to prepare a proper meal’. For women who have been assisting their mothers for years during their youth and maybe have been preparing for years meals for their husband and several other children, teaching them to cook must seem as if you tell them that they are not women or that they are mentally handicapped. Claiming implicitly that a mother is not giving enough food to her child is accusing her of wanting to kill it and puts her in a very difficult situation before her husband and his family who believe in witchcraft and people who eat the soul of others. No wonder that women do not inform their husbands on such a diagnosis and advice.

In Niger, health workers know very well that mothers often refuse to attend food demonstration gatherings because they (the mothers) consider it a public insult either of not knowing how to prepare meals or not giving enough food to the child, while the mother herself is in good health.

In Niger, tradition does not make the link between a marasmatic child, -which they describe in local language as the child suffering from the big head,- and lack of food or a feeding problem. We, modern health workers call this ignorance, instead of listening carefully and recognizing that “not eating well” might be a consequence of a deeper reason.

The fact that health staff are supposed to give food demonstrations reinforces again the simplistic relation made between food and malnutrition.

On the rare occasions that health staff in Niger advise mothers, they urge them to give more fish and meat with plenty of fruit and vegetables to the child. Not only is this advice scientifically doubtful because one should first consider calorie increase, but it is often not realistic from a financial or organizational point of view.

Culturally un-adapted programme

In most African countries and tribes, husbands are the owner of the child in a marriage. This is imbedded in a logic where the child represents an additional working force for the husband’s clan, for which the man’s clan compensated the woman’s clan by the bride price and on which logic food production and distribution, divorce procedures and inheritance systems are built. This system is nearly the exact opposite from western culture which is
traditionally based upon a common system with ancient India (until today in India, it is the wife’s clan who pays the bride price).

Under-fives’ clinics are conceived in an occidental culture. Mothers are being held responsible for the health and nutritional status of their child. But this is often not the case in an African context. The husband determines which food and in which amount he will take out of the storeroom, how much money he will and can make available for food. A woman who has to tell her husband that she has not been feeding her child well can get 2 answers from the husband. Either he will accuse her of having done something else with the food or the money he provided, or else he will interpret that she is accusing him of not taking his responsibility towards his children, the equivalent of a mother who does not prepare meals properly. In both instances women will be shouted at, a reason why they will only rarely talk in those terms to the husband.

Husbands are never invited to under-fives clinics to discuss the health of their child. Nevertheless, they have more power to intervene effectively. If the husband orders his wife to put more oil in the meal of his child or to prepare separate meals, she will execute his wishes as long as he provides her the means. Women want dare to take such an initiative independently. In case of malnutrition, as for any serious disease of a child, for which extra expenses (money or effort) are needed from the parents, the father of the child should be invited and explained the condition of his child. As long as the father is not actively involved, he will not take things seriously, because he is assuming he will be called for if something serious happens with his children, for the simple reason that he, and not his wife, is responsible for their health.

And the health staff?

Under-fives’ clinics are generally held by nurses or midwives at health centre level. They are facing several problems: the complexity of malnutrition and its causes, making standardized answers inadequate; no means to reduce poverty or to supply food; running behind the problem instead of early intervention; contradictory and/or unrealistic instructions. Results are minor, compared with a major effort demanded, which will further diminish their already low motivation. Dialogue between patient and health worker is scarce and fragmented, whereas a chronic condition demands continuous interaction and negotiation.

Health staff has been trained to think in biomedical and epidemiological models. Malnutrition is due to reduced food intake, sometimes aggravated by infectious or other disease, all related to poverty and ignorance (the epidemiological dimension). Because
poverty and ignorance are not immediately vulnerable to change through the health service, health staff feels helpless and claims that malnutrition is a social, not a health problem.

Moreover, instructions to run the under-fives’ clinic are often ambiguous and incomplete, meaning that all relevant situations are not covered or that they allow to classify the same condition under different categories (example: (2)).

In such an environment of poor diagnosis, poor dialogue and poor treatment, no wonder that results are poor as well.

Changing the paradigm: the malnourished child as a symptom of a family under stress

Malnutrition has been studied and treated mainly in a traditional biomedical model, identifying the problem as a vicious cycle between deficient food intake and (infectious) disease (Figure 1). Epidemiologists have added the socio-economic factor: poverty, illiteracy, ignorance in general (Figure 2). This approach allows malnutrition to be described as a complex problem of risk factors (3). But the bio-medical as well as the epidemiological model fail to respond to the question: “Why is this child malnourished, and not the neighbour’s child?” Curiously among 60 to 90 percent of children in Niger, living below the absolute poverty barrier, only 3 to 6 percent are moderately to severely malnourished (stunting excluded). How can we explain this? What is the difference between these children?

Figure 1: The biomedical paradigm of malnutrition

![Figure 1: The biomedical paradigm of malnutrition](image1)

Figure 2: The biomedical and epidemiological model of malnutrition

![Figure 2: The biomedical and epidemiological model of malnutrition](image2)
Modern medicine and medical psychology and anthropology recognize that other dimensions determine illness and disease patterns. Disease is also determined by psycho-social and anthropological factors that make the diagnosis much more specific and individual. Only at this level, can malnutrition be understood in all its dimensions.

A systems approach in psycho-therapy and family care in Western countries describes how the sick child (mentally or physically) represents the major symptom of a sick family, rather than being the source of ill health. The child does not eat well, cries all night, makes a suicide attempt in an attempt to prevent his or her parents from divorcing. The fracture in the case of a battered child syndrome is the symptom of a family under stress. Obesity in Western children often is a symptom of (emotional) child neglect.

Family therapy as applied in the Western world takes the patient only as the symptom carrier of a sick family, especially if we talk about a ‘sick’ child. When parents cannot solve their personal problems between them, the family finds itself in an imbalance of complex power and affinity relations. The child generally places him or herself in between the two parents as some kind of buffer, but because he or she cannot cope with this stress which goes far beyond children’s capacity, the child de-compensates and becomes ill, in other words starts to show symptoms. In system therapy, the child is regarded as a victim of the situation and therapy concentrates purely on the real relation problems of more powerful members in the family system (the parents). When therapy can change the situation of the parents, the child’s symptoms disappear spontaneously.

How could this be translated into third world situations? In an informal observation of hospitalized children with malnutrition in Zimbabwe in the early nineties, it was estimated that 50 % of cases were HIV related. All these mothers were initially ‘accused’ of not taking care well of their baby, while they were actually involved in a dramatic and hopeless fight to prevent their child from dying. Another 20 to 30 % were related to divorce and early weaning. The remaining 20 to 30 % were more diverse in ‘diagnosis’: depression or retardation of the mother, domestic violence and child neglect, epilepsy of the mother, alcoholism, social rejection of the family, deceased mother etc. Nearly all were situated in the psycho-social corner.

The list can be as long as the number of cases of malnutrition because at this level of analysis, every case represents a particular, unique story. But what becomes clear, lack of food is not a major issue and demonstration kitchens or discussions on food taboos are
only occasionally the most appropriate answers to the problems encountered. Already in 1960, Farmer (4) described the importance of social and psychological stress situations in children with Kwashiorkor. Goodall (5) established the relation between Kwashiorkor and emotional disorders and the higher incidence of abrupt weaning and separation from the mother. Bouville (6) observed that malnourished children in Cameroon lived in a more unstable and less affectionate environment than healthy children. Deep cultural roots at the base of child mortality and hidden infanticide by refusing to feed the child are described in Ghana and elsewhere in Africa (7).

If we can agree that malnutrition is a complex phenomenon embedded in a complex family system, it is obvious that the treatment of malnutrition demands a comprehensive approach. Comprehensive or global care, or still “whole patient care” entails a shift from a purely biomedical and/or epidemiological model towards a model that includes psycho-social and anthropological diagnosis and intervention (Figure 3).

Figure 3: Global care diagnosis of malnutrition

In third world countries, due to the particular development of a modern medical system where first line doctors with their specific mission of global care are largely lacking, global care is virtually absent and unknown among health workers. Not surprisingly, those aspects of a health care system that most need this global approach are also those with the poorest performance: care for chronic illness such as tuberculosis, AIDS, psychiatric disorders, epilepsy, care for handicapped people, and of course malnutrition.

In a third world situation, children in families under stress quickly become malnourished. The already precarious environment
does not tolerate any inattention towards the child’s development. Whenever the child gets into a situation of less attention such as child neglect, depressed mother, new baby or pregnancy in the family, threatening divorce of the parents with domestic fights, etc, (often already imminent) malnutrition will become apparent. It is only through this very individualized diagnosis and recognition of the situation that specific interaction with the parents becomes possible and the health worker will be able to build enough confidence for his (feeding) advice to be acceptable.

Two case studies at the end of this article, derived from personal field experience, illustrate the concepts that have been developed so far. They will serve as well as examples of how a comprehensive approach can lead to new dynamic solutions of the problems surrounding malnutrition. The examples present complex situations, simultaneously illustrating several aspects of the comprehensive approach proposed in the paper. In her article, Goodfriend (8) describes the importance of ‘psychosocial paediatrics’ in developing countries with similar but less complex case studies.

How to operationalize a comprehensive approach for malnutrition

Long term solutions

Obviously, long term solutions can be obtained only through a profound change in training of medical and para-medical personnel, with more emphasis on a holistic type of care in opposition to the classical bio-medical approach, with its narrow view on disease and illness. This demands a profound up-grading of general medicine in third world countries where first line global care is recognized only in a very limited way and most doctors wish to become specialists as soon as possible.

Immediate and mid-term solutions

Changing attitudes and routine approaches towards cure and care is not an obvious task. Global care is a typically western approach of care which gradually developed during the after-war period in balance with the changing claims made by society. These forces did not exist in third world countries, which explains that no spontaneous evolution to a more comprehensive care medicine took place. Global care in modern medicine is largely exogenous in non-western societies.

Probably the most important tool to convince health workers at any level of the importance of global care, especially for chronic
and complex conditions such as malnutrition, is by giving the example. “Living the example” is a very powerful educational tool. It is too much put aside though in actual development aid because the difference between giving an example is easily confounded with what we call ‘substitution’, replacing what somebody else is capable of doing himself. Of course this means also that medical doctors with the specific skills are available to give this ‘demonstration’.

It is difficult on purely theoretical grounds to change basic attitudes of health personnel. Field experience is a radical way of convincing health workers of a need for change. How this would fit in modern development aid strategies where expatriate public health doctors are giving advice to ministers and secretary generals and where Sector Wide Approaches focus on solving the problems with global financial aid, remains an open question.

In my experience ‘giving the example’ does not suffice though, no matter how useful. It can only be the initial ‘click’ which makes people aware of interesting new dimensions in health care delivery. Explicit knowledge of underlying reasons for malnutrition in the psycho-social and anthropological sphere and the degree to which those factors are vulnerable to change are equally important (see Table 1). Care for malnourished children should be delivered by general practitioners with a global care approach, rather than by nutritionists or other specialists.

**Table 1:**

<table>
<thead>
<tr>
<th>Reasons for malnutrition in the psycho-social and anthropological sphere</th>
<th>Areas of action possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Early weaning due to divorce</td>
<td>➢ Involvement of the husband</td>
</tr>
<tr>
<td>➢ Early and sudden separation from the mother due to divorce, death, new pregnancy</td>
<td>➢ Supporting the therapy managing group</td>
</tr>
<tr>
<td>➢ Mother with serious psychological or psychiatric problems such as depression, mental retardation, epilepsy, divorce, psychosis, etc.</td>
<td>➢ Family planning</td>
</tr>
<tr>
<td>➢ Child neglect; battered child syndrome</td>
<td>➢ Treatment of mental or physical illness</td>
</tr>
<tr>
<td>➢ Alcoholism; domestic violence</td>
<td>➢ Effective integration of preventive and curative services</td>
</tr>
<tr>
<td>➢ Chronic disease of the mother: AIDS, tuberculosis, etc.</td>
<td>➢ Gradual diagnosis through continuous dialogue</td>
</tr>
<tr>
<td>➢ Severe stress due to polygamy, fertility problems, etc.</td>
<td>➢ Formulation of unambiguous operational instructions to follow the weight evolution and to allow a continuous dialogue</td>
</tr>
</tbody>
</table>
Re-organization of health services and operational instructions can facilitate global care attitudes as well:

**Integration of preventive (under-fives’ clinic) and curative services**

Weighing children is a diagnostic act. It determines not only a degree of malnutrition but it also reflects to a certain extent the prognosis of a sick child. Weighing children is related to curative care in the first place. The poor integration of health care services and the fact that under-fives’ clinics have become a preventive programme among others has disrupted the relation between curative services and the weighing act. Instead of weighing the sick child as a priority act, it has become an additional need of integration of care, after weighing a priori healthy children. Weighing sick children is regarded as an extra burden to the health service. This distortion has probably grown from the positive bias towards preventive care at primary care level which has caused in the eighties and nineties a disproportionate discredit of curative care.

Instructions to change this situation are not difficult to introduce at health centre and even at district hospital level. Every sick child should be weighed and his weight evolution should be taken in account in diagnosis and treatment. When working with medical students in Niger, who hardly know about the existence of growth charts and have a maximum of ten hours course on malnutrition during the whole curriculum, the fact that the interpretation of the weight chart could influence diagnosis and medical decision was completely new to them. One of them reported that he was very proud of having been able to apply it in practice. It was for the first time he noticed the apparent contradiction of his overweight aunt with a malnourished child and who was ashamed to attend the ‘feeding clinic’, because “how could they (the health staff) tell that she was not feeding her baby well?” He filled out the child’s growth curve because several weights were written down on its vaccination card and discovered it was a problem which could have been identified some months before already.

**Early and gradual diagnosis of malnutrition, allowing a continuous dialogue**

If one maintains preventive weighing clinics, the purpose of these clinics cannot be in the first place to identify severe malnutrition. In severe malnutrition, prevention has already failed and the likelihood that simple measures will have a positive impact is small. In preventive baby weighing clinics, developing a
continuous dialogue about essentially trivial problems is more important than big therapies for severely malnourished children. Early deterioration of the nutritional status of a child cannot be detected through the approach of weight to length follow-up, but through simple interpretation of stagnating or diminishing weight over time. Though less scientific, simple instructions that favour dialogue on the health status and development of the child are more important than sophisticated interpretations of weight and height. In other words, diminishing efforts at the biomedical and nutritional diagnosis level might favour dialogue and a more global care approach.

Table 2 summarizes the proposed reorganization of the services and identifies the priorities for different activities. Weighing children is only useful when it either reinforces diagnosis and treatment, or when it refines the quality of the dialogue with the mothers.

**Table 2:**

<table>
<thead>
<tr>
<th>Service – Activity</th>
<th>Content – Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST PRIORITY:</strong></td>
<td>Refining diagnosis</td>
</tr>
<tr>
<td>Weighing the sick child during curative clinics (weight-to-length as long as weight evolution is not being followed)</td>
<td>Establishing a dialogue on the health and development of the child with the mother</td>
</tr>
<tr>
<td><strong>SECOND PRIORITY:</strong></td>
<td>Weighing is to reinforce the dialogue, not a priority in itself</td>
</tr>
<tr>
<td>Introducing preventive 'Well-baby' clinic</td>
<td></td>
</tr>
<tr>
<td><strong>THIRD PRIORITY:</strong></td>
<td>Weighing is to reinforce the dialogue, not a priority in itself</td>
</tr>
<tr>
<td>Adding weighing sessions during 'well-baby' clinics and establishing weight to age curves</td>
<td>(weight-for-age is less time consuming and can better reinforce a continuous dialogue than weight-to-length)</td>
</tr>
<tr>
<td>(weight-for-age is less time consuming and can better reinforce a continuous dialogue than weight-to-length)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 gives an example of 'easy-to-apply' and unambiguous operational instructions for weight evolution interpretations. The stages of malnutrition are 'operational' definitions that do not necessarily correspond to precise scientific categories. In field
situations, instructions regarding the identification of malnutrition are often ambiguous: either classifications are not mutually exclusive or they do not cover all situations one can meet in the field.

Table 3: Operational instructions

<table>
<thead>
<tr>
<th>Situation 1: The child gains weight normally</th>
<th>Situation 2: The child has not gained weight for 1 or two months</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO MALNUTRITION</td>
<td>DANGER OF INCIPIENT MALNUTRITION</td>
</tr>
<tr>
<td>To do:</td>
<td>To do:</td>
</tr>
<tr>
<td>Congratulate the mother</td>
<td>Reassure the mother</td>
</tr>
<tr>
<td>Ask whether the child has any health problems</td>
<td>Evaluate together with the mother if there are any health or weaning problems</td>
</tr>
<tr>
<td>Ask whether the mother is in need of family planning</td>
<td>Propose at least 4 daily meals for the child with an increase in calories</td>
</tr>
<tr>
<td>Administer Vit. A every 6 months</td>
<td>Insist on the importance of the next visit</td>
</tr>
<tr>
<td>Vaccinate when indicated</td>
<td>Propose family planning</td>
</tr>
<tr>
<td></td>
<td>Vit. A and or vaccination if indicated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situation 3: The child has not gained weight for 3 to 6 months OR The child has been losing weight but less than 700 g compared with max. 2 months ago</th>
<th>Situation 4: The child has not gained weight for more than 6 months OR The child has been losing weight for 2 consecutive months (or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATE MALNUTRITION</td>
<td>SEVERE MALNUTRITION</td>
</tr>
<tr>
<td>To do:</td>
<td>To do:</td>
</tr>
<tr>
<td>Follow instructions as under situation 2 +</td>
<td>Follow instructions as under situation 3 +</td>
</tr>
<tr>
<td>Examine the child and try to exclude physical illness</td>
<td>Refer immediately if no definite diagnosis can be made or a promising solution proposed</td>
</tr>
<tr>
<td>Evaluate feeding practices</td>
<td>If not referred, intensify the follow-up visits weekly or according to the necessity of the underlying disease detected</td>
</tr>
<tr>
<td>Treat and give advice accordingly</td>
<td></td>
</tr>
<tr>
<td>Involve the father of the child if considered appropriate by the mother</td>
<td></td>
</tr>
<tr>
<td>Intensify the follow-up visits in accordance with the mother</td>
<td></td>
</tr>
</tbody>
</table>

Instructions on when and how to invite fathers in the process of care

At least for sub-Saharan Africa, fathers should be involved in the diagnosis and treatment of their children. They have in general more social, financial and general decision power than their spouses. They feel generally honoured when invited to talk about
the health of their family because they feel recognized in the responsibility they are carrying. In the same way it took public health specialists nearly twenty years to discover that husbands should be involved in family planning at every stage, field experience shows more and more that the involvement of the father in decisions on the health of their children is extremely important. For every case of moderate and severe malnutrition, the father should be invited to clarify the dangerous situation to which the child is exposed. In his absence or when the husband constitutes an important obstacle to the child's health, uncles are often strong allies as they are important members of the therapy managing group. Much more than in Western societies, the therapy managing group is a powerful instrument to tackle complex health problems.

Amid all the new instructions proposed here, the preponderantly male nurses in Niger were most sensitive to the latter. They understand in a very natural way that it is against their culture if one does not talk to the father when a child is very ill. They recognize the particular decision taking power of the father and they assume that involving the father is culturally very acceptable.

Conclusion

Under-fives’ clinics as they are generally conducted in Sub-Saharan Africa at the moment, are in crisis. They do not reach the objective of efficiently identifying and taking care of children with malnutrition, even less so for preventing it.

The underlying reasons are multiple and complex. They are situated at the level of diagnosis, treatment and follow-up, as well as at the operational level. Small adjustments in the operational instructions of health centre staff, increased supervisory visits or quality circles won’t be able to counter poor performance. Without major changes, the effort and time investment at the diagnosis and treatment centres are not worthwhile. There is need for a radical change of paradigm on how malnutrition and its causes are explained and taken care of.

This article is based on non-systemized observation and individual case studies, combined with knowledge of other scientific disciplines than nutrition and bio-medical medicine. The critical reader will argue correctly that a lot of the hypotheses need confirmation and refinement. This text is indeed written to encourage researchers to take new directions in the investigation of the malnutrition problem at the individual patient level of a health centre or hospital.
Two major problems need to be answered.

In the first place, malnutrition, as an individual health problem, should be re-investigated in the frame of the ‘global care approach’, taking in account psycho-social and anthropological aspects of illness. Malnourished children should be systematically examined for physical illness, for the family position in society and for the family structure in which the child is growing. These families could be compared with families without malnutrition. For this matter, medical doctors should look for close collaboration with anthropologists and psychologists (psychiatrists) with family therapy specialization.

Secondly, and from the operational point of view probably more difficult, would be the testing of new ‘diagnostic’ and ‘therapeutic’ procedures that are concentrating on the evolution of growth, prevention of malnutrition by early intervention and a continuous dialogue between elders and health workers. Unambiguous and realistic (applicable in the field) operational instructions need to be formulated and additional training for a constructive dialogue to be offered to first line health workers. This ‘new package’ should than be applied (correctly) and monitored for a long enough period in order to proof any impact on the nutrition status of these children and their long term survival.

In the meanwhile, local initiatives are useful and even obligatory in order to create a more realistic and culturally adapted programme through reinforcing the dialogue between health staff and patients, involving fathers in diagnosis and treatment, avoiding any form of accusation, and by integrating the weighing act into the curative services. Others have suggested community involvement and contracting out as important initiatives to be taken (9).

At the same time, medical practitioners (generalists) and other care givers of the first line should be trained in global care approaches and techniques that enable them to understand and manipulate psycho-social and anthropological aspects of illness. This would not only be useful for the malnutrition problem, but would increase the quality of care and cure in general.
**Case study 1**

A young father was presenting his malnourished child at the district hospital. This was a rather particular event, fathers usually do not accompany their children to hospital. When asked where the mother was, he answered that she had run away and that she left the child behind.

The next day, the nurses informed the doctor that this was the second time that the child was admitted with malnutrition but that on the first occasion the mother was present. The hospital insisted that the father would search for the mother, because he was not capable of looking after the child properly. It was only then that the man admitted not to be the real father but rather a half brother of the child. He was the only son of his father's first wife. He confirmed that they knew where the mother was, but that the mother was not allowed near to the child by her husband because she had abandoned the child and she was lazy anyway. After insisting for some days, the mother presented at the hospital. The mother indeed did not show much interest for the child and all questions were answered with very little enthusiasm and did not lead to any clarification of the obvious conflict situation. The provisional diagnosis was between borderline mental retardation or depression of the mother.

Because no meaningful information could be obtained from the mother, further exploratory conversations were held with the half brother. The doctor tried to explain him that maybe the mother was not lazy but depressed. A few days later, the young man explained that the child was not really his father's, because his father had been treated for fertility problems by the traditional healer. After the necessary ceremonies, a brother of the father was brought into the hut of the woman to make her pregnant. She delivered the child in the name of her husband. This is a well known practice in many African societies. The husband was described as a chronic alcoholic who visited prostitutes on a daily basis. The nurses confirmed this part of the story.

When the doctor confronted the mother with this story, she confirmed more or less and only another week later, the story finally became more clear.

When the woman was about sixteen years old, she was approached by her future husband. She always denied his advances, (she was much younger, and he had already a first wife), but this was difficult because she was from a very poor family, while the man was a storekeeper, hence relatively rich. Moreover, her family was in debt towards the man, because he buried several family members.

One day, he raped her. Not noticing menses, she got convinced after a while that she was pregnant and so she was obliged to marry the man. A few months later, she had a spontaneous abortion (probably she had a psychological amenorrhoea, which is a rather common syndrome in Zimbabwe).

In summary, she married her rapist, she got pregnant in his name and was treated badly because the husband was drinking heavily and she was only second wife. She had run away on a previous occasion with the child, but her parents had sent her back because they were still expecting the bride price the husband should pay them, after all these years. When the mother realized that the child was getting ill even when staying with the husband, she run away without the child.

After some more days, the husband and his first wife presented at the hospital. They described the second wife as very lazy and unreliable. He denied all alcohol abuse.

The couple was confronted with the fact that the child might not be his and that the mother was about to make an official complaint to the police for rape, which might cost him 8 years of prison. Even if he would not be convicted, the whole community would know what had happened. Although he denied all allegations, he agreed to divorce without claiming the child... This was the wish of the mother.

This case study shows clearly how the malnourished child was only the symptom carrier in a very sick family situation. There was no relationship between malnutrition and food availability. The child was used in a war between the two parents. Luckily, not all cases have the same complexity. The example was given because it illustrates several aspects of the discussion in the paper.
Case study 2

The nurse in charge of one of the health centres contacted the hospital because neighbours came to see her complaining about a woman who was beating her children and refusing to give them food. On the doctor's advise, she was referred to the hospital. She was admitted with two children below 3 years old. One of them was obviously malnourished.

It was only after a few days that she wanted to talk about her problems. Her husband was working in the capital. His first wife divorced a few weeks before. After the divorce, the husband took the three children (7, 3 and 1 year old) and placed them with his second wife. Now she was the first wife in the house, confronted with 6 children all below 7 years of age. In absence of the husband it was clear that she could not cope with the workload and that she had no emotional relation with the 3 stepchildren. Even in the ward, she was not cleaning the child when soiled, and she was feeding the child without commitment, while she was breastfeeding with love her own baby. The husband was called for. When he came and the situation was explained to him (in the meanwhile a second child was brought in malnourished) he wanted to take everybody home with the message that his wife would have to learn to cope with the situation. The doctor said that this was too dangerous because the wife was willing to take care with the head, but that her heart was refusing and that she was not guilty for that. A few days later the husband insisted to take everybody home anyway.

The local nurse was instructed to do a home visit after a few days to evaluate the situation. She phoned back to say that the three children of the first wife were back with their natural mother. The husband obviously had understood the situation and took a creative decision.

Discharging the child was a risk. But the husband got all the information in an organized way, which allowed him to understand the situation. The solution was entirely his. It was important to wait for the husband and to leave the decision to him because he is ultimately responsible for the children.

References

INTRODUCTION

In most contexts of developing countries, malnutrition and growth failure appear at the age of about 6 months and prevalence of stunting reaches a maximum before 24 months of age (1). This coincides with the weaning period, which is the time period when different kinds of foods are successively introduced to complement breastmilk.

In regard to the simultaneity of the apparition of protein energy malnutrition and of the introduction of complementary foods, it appears that there are probably strong relationships between malnutrition and complementary foods. They can be either directly related because inadequate complementary food intakes or nutritional value leads to insufficient energy or micronutrient absorption or indirectly related since the early introduction of complementary foods often reduces breastmilk intakes and can cause food borne diseases (i.e., diarrhoea, parasitic infections) (2) or reduce the micronutrient bio-availability of the whole diet.

Complementary foods can be defined as any liquid or solid nutrient-containing foods given to young children in addition to breastmilk (1). In most contexts of developing countries, the first complementary foods consist in special transitional foods like gruels generally prepared from blends of flours or from fermented cereal doughs. As total energy and nutrient intakes of infant is the sum of energy and nutrient intakes from breastmilk and from complementary foods, the adequacy of the characteristics of these special transitional foods to the nutritional requirements and physiological or anatomical constraints of infants appears to be one of the necessary conditions of sufficient dietary intake, therefore of normal growth.

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Factors affecting energy and nutrient intakes from complementary foods

The variability and low level of energy intakes from complementary foods can be illustrated by giving some results of 11 surveys (Trèche et al, unpublished) recently carried out in five African countries (Burkina Faso, Cameroon, Congo, Guinea and Senegal) on 4-to-23-month-old children (Table 1). One of the objectives of these surveys was to estimate the amounts of complementary foods, which are effectively consumed per meal in free-living conditions.

Table 1: Gruel intakes of infants and young children in free-living conditions in five African countries.

<table>
<thead>
<tr>
<th>Countries (setting)</th>
<th>Age (month)</th>
<th>Type of gruels</th>
<th>n</th>
<th>Amount consumed g/meal</th>
<th>g/meal/Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkina Faso (Rural area)</td>
<td>4-23</td>
<td>Home made</td>
<td>34</td>
<td>98</td>
<td>13.0</td>
</tr>
<tr>
<td>Burkina Faso (Urban district)</td>
<td>6-8</td>
<td>Locally processed blend</td>
<td>139</td>
<td>74</td>
<td>10.9</td>
</tr>
<tr>
<td>Burkina Faso (Urban district)</td>
<td>6-8</td>
<td>Local infant flours</td>
<td>180</td>
<td>46</td>
<td>6.2</td>
</tr>
<tr>
<td>Burkina Faso (Urban district)</td>
<td>6-23</td>
<td>Fermented millet</td>
<td>24</td>
<td>128</td>
<td>13.7</td>
</tr>
<tr>
<td>Cameroon (Urban district)</td>
<td>4-11</td>
<td>Imported infant flour</td>
<td>60</td>
<td>99</td>
<td>12.7</td>
</tr>
<tr>
<td>Cameroon (Urban district)</td>
<td>6</td>
<td>Fermented maize</td>
<td>50</td>
<td>98</td>
<td>15.1</td>
</tr>
<tr>
<td>Congo (Urban district)</td>
<td>6</td>
<td>Fermented maize</td>
<td>252</td>
<td>141</td>
<td>20.6</td>
</tr>
<tr>
<td>Congo (Urban district)</td>
<td>7</td>
<td>Locally processed blend</td>
<td>73</td>
<td>135</td>
<td>19.0</td>
</tr>
<tr>
<td>Congo (Urban district)</td>
<td>6</td>
<td>Imported infant flour</td>
<td>64</td>
<td>109</td>
<td>15.4</td>
</tr>
<tr>
<td>Guinea (Urban district)</td>
<td>6-11</td>
<td>Locally processed blend</td>
<td>108</td>
<td>135</td>
<td>15.5</td>
</tr>
<tr>
<td>Senegal (Urban districts)</td>
<td>6-35</td>
<td>Locally processed blend</td>
<td>203</td>
<td>95</td>
<td>10.6</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.3</td>
</tr>
</tbody>
</table>

n: number of observed meals

The average amount of gruel consumed ranged from 46 to 141 g per meal corresponding to only about 6 to 21 g per meal and per kg of body weight with a general average of about 15 g per meal and per kg of body weight. This value is considerably lower, about half, than the generally recognized gastric capacity, which is about 30 g per kg of body weight (3). Therefore, young children do not consume the quantity of transitional foods that they could normally do. This leads to take a special interest in the determining factors of their
food intakes in order to understand their low level and important variability.

Amongst the determining factors of energy and nutrient intakes from complementary foods, one can distinguish between:

- Immediate factors;
- Underlying factors which can be categorized as food, caregiver and child dependent;
- Some more basic causes related to household and mother characteristics, to food availability and to child’s characteristics (4,5).

Three immediate factors determine the level of the daily energy or nutrient intakes from complementary foods: the number of meals per day, the amount of complementary foods consumed at each meal and the energy or nutrient density of each meal. Thus, the total energy intake from complementary foods can be calculated using the following formula (5):

$$E_{I_d} = \sum_{i=1}^{n} C_{ai} \times E_{Di}$$

with:

- $E_{I_d}$ = Daily energy intake (kcal/d) from complementary foods
- $i$ = Rank of the meal
- $n$ = Total number of meals
- $C_{ai}$ = Consumed amount (g) of the $i^{th}$ meal
- $E_{Di}$ = Energy and nutrient density (kcal/g) of the $i^{th}$ meal

In developing countries, the number of meals per day generally does not exceed two or three and cannot be easily increased because of the heavy workload of mothers. Energy density mainly depends on the nature of foods and processes used for preparing meals. The amounts consumed per meal depend on numerous underlying factors.

These underlying factors and their relationships with other determining factors can be summarized on a conceptual framework of determinants of daily energy and nutrient intakes from complementary foods (Figure 1).
Figure 1: Conceptual framework of determinants of daily energy and nutrient intakes from complementary foods (CF)
Caregivers’ education, beliefs and income
- Household specific:
  - standard of living
  - purchase power
  - size and structure
  - ethnic origin

- Mother specific:
  - age
  - occupation
  - level of education
  - nutritional knowledge
  - technological know-how

Household specific:
- standard of living
- age
- occupation
- level of education
- nutritional knowledge
- technological know-how

- Household specific:
  - purchase power
  - size and structure
  - ethnic origin

- Mother specific:
  - age
  - occupation
  - level of education
  - nutritional knowledge
  - technological know-how

Food availability
- Agroecological context
- Cost of living

Child’s characteristics
- Genetic variability
- Gender
- Age
- Weight
- Nutritional status
- Health status

Gruel characteristics
- consistency
- flavor, aroma
- dry matter content
- nutrient composition

Feeding habits
- breastfeeding pattern
- intervals between meals
- meal duration
- level of supervision and encouragement during meal consumption

- Number of meals with CF per day

Preparation methods
- formulation
- processing

Child’s aptitude for ingesting food
- gastric capacity
- appetite
- specific food aversion

Amount of CF consumed per meal

E&N intakes from CF

Energy and nutrient density of CF
Amongst the underlying factors, a distinction can be made between those relative to the complementary foods, those relative to caregivers and those related to the child.

The complementary food characteristics likely to influence intakes mainly consists in consistency, other organoleptic characteristics such as flavour and aroma (6), and dry matter and nutrient content which directly determine energy and nutrient density of the gruel, but can also influence its appetibility (7). Particularly, the importance of energy density and consistency of gruels on gruel intakes have been demonstrated (8-10).

Caregivers’ dependent factors can be subdivided into those, which determine the methods of preparing gruels and those corresponding to feeding habits. In addition to the daily feeding frequency, these include breast-feeding patterns, intervals between meals, meal duration and level of supervision and encouragement provided during meal consumption.

The third category of underlying factors corresponds to child aptitude for ingesting foods, which mainly includes gastric capacity and appetite.

Three kinds of basic causes can be considered: caregivers’ education, beliefs and income, food availability and child’s characteristics. The first one includes household characteristics (i.e., standard of living, purchasing power, size and structure of the household, ethnic origin of household members) and mother’s characteristics (i.e., age, occupation, level of education, nutritional knowledge, technological know). The second one corresponds to food availability and depends on the agro-ecological context and, when foods are not produced by the mother, on the price of ingredients likely to be incorporated into the gruels. The third one corresponds to child’s characteristics, both permanent like genetic factors or gender, and temporary like age, weight, nutritional and health status.

The relative significance of the various immediate and underlying factors in free-living conditions is still not well known and probably depends on the context (4,5).

**Required characteristics**

Taking into account their role and factors likely to determine their level of intakes, it is easy to define the main general required characteristics of complementary foods, particularly those of special transitional foods:
• They must not reduce breastmilk intake and, as far as possible, the bio-availability of micronutrients contained in breastmilk;
• They must be safe that is to say free of pathogens and toxic compounds;
• They must have an appropriate energy and nutrient contents with sufficient bio-availability;
• They have to be accessible and acceptable.

The necessary safety of complementary foods has been extensively emphasized (2) and begins to be well known. But their required nutritional characteristics and the conditions of their accessibility and acceptability are still often not well known and deserve to be reminded.
**Characteristics relative to the nutritional value of special transitional foods**

The principle for calculating the desired average energy or nutrient density of complementary foods consists in calculating the amount of energy or nutrient needed from complementary foods by subtracting the amount of energy or nutrient consumed from breastmilk from total energy or nutrient requirements of the child \(1\). Then the desired average energy or nutrient density in complementary foods is obtained by dividing the amount energy or nutrients needed from complementary foods by the total amount of complementary foods which is daily consumed.

This calculation is the first step of the estimation of the minimum energy density required for complementary foods (Table 2).

**Table 2: Estimation of the minimum energy density of complementary foods (kcal/100g)**

<table>
<thead>
<tr>
<th>Class of age</th>
<th>Requirement (kcal/d)</th>
<th>Energy intake from breastmilk (kcal/d)</th>
<th>Energy that a child must be able to consume from CF (kcal/d)</th>
<th>Gastric capacity(^3) (ml)</th>
<th>Minimum energy density depending on the number of meals per day 2 m/d</th>
<th>3 m/d</th>
<th>4 m/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8 month</td>
<td>682 ±2SD</td>
<td>Low(^2): 217</td>
<td>635</td>
<td>249</td>
<td>128</td>
<td>85</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Average: 413</td>
<td></td>
<td>Average: 439</td>
<td></td>
<td>88</td>
<td>59</td>
<td>44</td>
</tr>
<tr>
<td>9-11 month</td>
<td>830 ±2SD</td>
<td>Low(^2): 157</td>
<td>880</td>
<td>285</td>
<td>155</td>
<td>103</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Average: 379</td>
<td></td>
<td>Average: 658</td>
<td></td>
<td>116</td>
<td>77</td>
<td>58</td>
</tr>
<tr>
<td>12-23 month</td>
<td>1092 ±2SD</td>
<td>Low(^2): 90</td>
<td>1275</td>
<td>345</td>
<td>185</td>
<td>123</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Average: 346</td>
<td></td>
<td>Average: 1019</td>
<td></td>
<td>148</td>
<td>98</td>
<td>74</td>
</tr>
</tbody>
</table>

\(^1\) From Butte (11) and Torun et al (12)  
\(^2\) Mean-2SD of energy intakes observed in developing countries  
\(^3\) Taking into account an average gastric capacity of 30 ml per kg of body weigh

For each class of age, after estimating a safe level of energy requirement by adding two standard deviations to the average requirement of children, the estimated energy of breastmilk is subtracted taking into consideration average or low level of breastmilk intakes to obtain the energy that a child must be able to consume from complementary foods. After taking into account gastric capacity, it is possible to calculate the minimum energy density corresponding to different feeding frequencies. If children consume two meals per day, which is the most prevalent feeding frequency in developing countries, a minimum energy density of 128 kcal per 100 g is necessary to allow most children between 6 and 9 months of age to meet their energy requirement. This energy density is also sufficient to meet the energy requirements of older...
children with three meals per day and low breastmilk intakes. Thus, an energy density of about 120 kcal per 100 g can be considered as a reasonable value for most children less than 2 year old.

The same calculation can be used to estimate the desired mineral and vitamin density of complementary foods by class of age and by level of breastmilk intake taking into account different levels of bio-availability [1]. The desired values are generally expressed per 100 kcal. Thus, if the complementary foods have micronutrient contents at least equal to these values, the corresponding mineral or vitamin requirements will be met if children consumed sufficient amounts of complementary foods to meet their energy requirement.

But micronutrients must not only be available but also bio-available that is to say effectively absorbed and metabolized [13,14]. Bio-availability depends on:
- The chemical nature of nutrients;
- The physicochemical environment of molecules;
- The technological processes applied;
- The ability of the digestive tract of young children to adapt to different nutritional and physiopathological situations;
- The absence of anti-nutritional factors.

The most frequently encountered anti-nutritional factors are phytates which limit the bio-availability of protein, phosphorus and, above all, bivalent cations (e.g., Iron, Zinc and Calcium), enzyme inhibitors like antitrypsic factor which reduces the hydrolysis of proteins, polyphenols or tannins which can reduce protein digestibility and mineral bio-availability, lectins which can decrease digestive capacity and absorption and cause gastro-intestinal disorders and alpha-galactosides which cause flatulence and diarrhoea. Appropriate technological processes, mainly biological or thermic, must be used during complementary food preparation in order to reduce the activities of these anti-nutritional factors [14, 15].

**Accessibility and acceptability**

Concerning accessibility and acceptability; required characteristics depend on whether complementary foods are bought or homemade by caregivers.

For commercial products, in order to effectively contribute to child feeding, complementary foods and particularly special transitional foods, have to:
- Be available close to households with young children;
- Be cheap because of the low purchase power of most households;
• Be free of ingredients corresponding to food taboos;
• Be easy to prepare because of the heavy workload of mothers which often limits the time devoted to preparation and distribution of meals;
• Have organoleptic characteristics corresponding to local food preferences.

For homemade complementary foods, there are two main conditions: appropriate ingredients must be available and caregivers must have time and sufficient technological and nutritional knowledge.

Present situation of food products used as special transitional foods in developing countries

Commercialized food products usually used as special transitional foods in developing countries are mainly fermented products and infant flours.

Fermented products

These products which are commonly used for preparing gruels in African countries have numerous advantages because lactic fermentation induces favourable modification of nutrient composition, improves protein digestibility, reduces activity of some antinutritional factors such as phytates, tannins, and α-galactosides, inhibits pathogen growth and toxin production and confers to final products appreciated organoleptic characteristics in general (16). But they present also risks and disadvantages linked to the fact that:
• Traditional fermentation induces insufficient reduction of viscosity which does not allow the preparation of gruels having both appropriate energy density and consistency;
• Fermented gruels have generally insufficient essential nutrient density because they are generally prepared from only cereal and sugar;
• The amount of the D form of lactic acid produced can result in acidosis;
• Some pathogenic organisms, food borne viruses, mycotoxins and bacterial toxins can be resistant to the environmental changes induced by fermentation.
Commercial infant flours

These products found on the market in developing countries are likely to present several flaws. Their hygienic quality depends on the quality of raw materials and hygienic practices during processing. Their energy density is generally insufficient unless gruels are prepared using appropriate processes or when sources of amylases are added. Their nutrient content is generally insufficient for lipids and minerals and vitamins unless supplements are incorporated. Last, but not least, their price is out of reach of the majority of households.

The insufficiency of energy density of gruels prepared from most of the commercial flours locally produced in developing countries has been illustrated (17) by calculating the energy density of gruels prepared from different kinds of flours at concentrations corresponding to acceptable viscosity for infants. Amongst gruels prepared from 21 blends produced in small-scale production units only one from Gabon in which amylases were incorporated allowed to prepare gruels with both a sufficient energy density and an appropriate consistency. The situation was the same for infant flours locally produced in semi-industrialized production units as only 1 out of 11 blends, produced by extrusion cooking in Senegal, presented the required energy density and consistency. The situation was better, but still insufficient, for blends produced and commercialized in developing countries by the international industry. Thus, energy density of gruels prepared from commercialized infant flours produced in numerous developing countries appears to be insufficient except for the few flours produced following appropriate technological processes.

The determination of nutrient contents of infant flours locally produced in Africa and which were randomly collected in various African countries (Table 3) show that, with the exception of protein, nutrient contents are generally inferior to the required nutrient or micronutrient contents for most of the analyzed infant flours (18).

Potential technological ways to improve complementary foods

Improvements are needed at different levels: hygienic quality, energy density, nutrient balance and nutrient bio-availability. Improving energy density of gruel is of particular importance because, if its nutrient/energy ratio is well balanced, its nutrient density is improved at the same time.
Table 3: Nutrient content of some infant flours from local production units in Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Flour name</th>
<th>Protein (g/100g DM)</th>
<th>Lipids (g/100g DM)</th>
<th>Calcium (mg/100 gDM)</th>
<th>Iron (mg/100g DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>Ouando 2nd age</td>
<td>22.5</td>
<td>6.4</td>
<td>102</td>
<td>9.4</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>Misola</td>
<td>16.2</td>
<td>11.4</td>
<td>96</td>
<td>5.2</td>
</tr>
<tr>
<td>Burundi</td>
<td>Vitaline</td>
<td>12.7</td>
<td>9.5</td>
<td>128</td>
<td>6.7</td>
</tr>
<tr>
<td>Chad</td>
<td>Musalac</td>
<td>15.0</td>
<td>8.6</td>
<td>79</td>
<td>12.9</td>
</tr>
<tr>
<td>Congo</td>
<td>Vifafort</td>
<td>11 to 15</td>
<td>4.6 to 7.8</td>
<td>20 to 28</td>
<td>2.3 à 7.0</td>
</tr>
<tr>
<td>Côte d'Ivoire</td>
<td>Harina forte</td>
<td>12.1</td>
<td>6.8</td>
<td>325</td>
<td>8.6</td>
</tr>
<tr>
<td>Gabon</td>
<td>Nourivit</td>
<td>9.8</td>
<td>5.7</td>
<td>492</td>
<td>4.9</td>
</tr>
<tr>
<td>Guinea</td>
<td>Yélac</td>
<td>14.8</td>
<td>8.1</td>
<td>96</td>
<td>10.8</td>
</tr>
<tr>
<td>Niger</td>
<td>Bitamin</td>
<td>15.7</td>
<td>9.4</td>
<td>43</td>
<td>6.6</td>
</tr>
<tr>
<td>RD Congo</td>
<td>Céravap</td>
<td>15.4</td>
<td>6.5</td>
<td>369</td>
<td>7.3</td>
</tr>
<tr>
<td>Rwanda</td>
<td>Sosoma</td>
<td>17.8</td>
<td>3.8</td>
<td>500</td>
<td>18.1</td>
</tr>
<tr>
<td>Senegal</td>
<td>Ruy Xalel</td>
<td>8.0</td>
<td>5.2</td>
<td>39</td>
<td>5.1</td>
</tr>
<tr>
<td>Togo</td>
<td>Provital</td>
<td>9.6</td>
<td>7.4</td>
<td>41</td>
<td>1.9</td>
</tr>
<tr>
<td>Minimal recommended value</td>
<td></td>
<td>12.0</td>
<td>8.5</td>
<td>500</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Determination on randomly collected flours in market

Source: Trèche (18)

The best way to improve hygienic quality seems by popularizing the utilization of the HACCP system even in smaller production units (16).

To improve nutrient balance, there is a need to train the heads of production units to choose the adequate sources of protein, lipids, minerals and vitamins and to make an adequate formula.

To improve nutrient bio-availability, heat treatment like roasting and extrusion cooking or biological treatments like fermentation or incorporation of malted flours can be used (14).

To improve energy density of a gruel, it is necessary to induce a partial degradation of starch, which reduces viscosity drastically and allows the preparation of gruels with both higher dry matter content and appropriate consistency. In the contexts of developing countries two ways (i.e., enzymatic or thermo-mechanical hydrolysis) can be proposed to decrease viscosity (19).

The first way to incorporate malted cereal flours, which can be realized in small-scale production units or at household level. To determine the amount of malted cereal flour needed to prepare a gruel with the appropriate energy density and consistency, all that has to be done is to prepare gruels at required energy density with increasing amounts of malted cereal flour and measure the viscosity of the gruels (Figure 2). Then, on the graph giving the variation of
viscosity with amounts of malted cereal flour, it is easy to determine the incorporation rate corresponding to the desired viscosity.

**Figure 2: Effect of the incorporation of a malted cereal flour on apparent viscosity (20) of a gruel prepared at an appropriate energy density (120 kcal/100g) from an usual cereal/legume blend.**
The second way is by using very low cost extruders of limited capacity, which already exist in some Asian countries. As shown in Figure 3, the maximum acceptable value for viscosity is reached at a concentration of about 10 g of dry matter per 100 g of gruels.
prepared with raw rice while the concentration corresponding to the same viscosity is almost the double for a gruel prepared from extruded rice.
Recent studies have shown that incorporation of a source of amylases into infant flours results in the increase of energy intakes by infants (21-30). Effect of incorporation of amylase can be explained as follows (Figure 4).

Incorporation of amylases results in partial degradation of starch during gruel preparation. This partial degradation into dextrins and maltose probably contributes to increase the sweet taste of the gruel, which improves its appetibility and consequently has a positive effect on food intakes (7). But, above all, partial degradation of starch decreases viscosity, which allows the preparation of a gruel with higher energy density, which strongly influences energy intakes (6,21-30). At the same time the higher energy density may influence the amount consumed by reinforcing the taste of gruels thus increasing its appetibility. However, satiety might be reached sooner, and thus diminishing food intake (7). Finally, the increase of energy intake is the result of the perception by the child of the various modifications induced by the amylase incorporation.
Potential strategies to improve complementary feeding

To improve complementary feeding in a given context, it is necessary not only to propose practical solutions to make accessible complementary foods with the required characteristics but also to pass on the requisite nutritional knowledge about the best way to use them. Until now, there are two common strategies which include the promotion of complementary foods produced at different levels and the implementation of nutrition education campaigns in order to promote simultaneously adequate feeding practices (31).

The first one consists in the central production and promotion of infant flours at the lowest price. There are numerous examples where large-scale production at national level has failed because of supply or distribution difficulties. Implementation of small production units at local level however seems promising if their heads have sufficient technological and management training. The products which consist in instant flours or flours needing cooking can be sold or distributed within the frame of emergency programmes. Because of the difficulties to establish distribution
networks in rural areas, the products are mostly meant for urban families.

The second strategy consists in transfers of technology at household or community level. In order to implement it, mothers need to be trained in the preparation of safe complementary foods with good nutritional value using improved recipes. The targeted infants are mostly those belonging to households with low income living in rural areas.

Alternative strategies can be proposed in some contexts. For contexts where traditional products from small scale production units are frequently used as complementary foods, which is the case for fermented products in various countries, improvement of traditional processes followed by transfer of the improved processes to producers can be an interesting strategy. The number of people to train is considerably lower than in the case of technology transfer at household level. As for the two main strategies presented above, the main difficulty consists in convincing caregivers of the advantages of the improved products.

Another alternative strategy is the central production and promotion of food complements designed for being added to cereal based home made gruels. These food complements have to contain minerals and vitamins, sources of amylases, and eventually sources of protein, lipid and aroma. Their main advantage is that they are considerably cheaper than infant flours and allow the preparation of complementary foods of similar nutritional value and appetibility. Another advantage in rice consuming countries lies in the possibility to add them not only to rice flour but also to traditional preparations obtained by partially crushing rice grains cooked for a long time in an excess of water in order to obtain semi-gruels with acceptable energy density and consistency. These food complements can be sold or distributed in both urban and rural areas.

Conclusion

From this general presentation relative to the importance of complementary foods when promoting growth and development of infants and young children, it would be useful to remember that:

- Access to appropriate complementary foods, in particular at the beginning of the weaning period, is a necessary condition to satisfactory growth and development;
- Complementary foods must have characteristics adapted to the physiological and anatomical constraints of the child and to the socio-economical constraints of developing countries;
• Most of the complementary foods presently used in developing countries are inappropriate;
• There is no universal solution to make appropriate complementary foods accessible to infants and young children: their formulation and manufacturing processes as well as the strategies for promoting their use must be adapted to each context.

Success of strategies depends mainly on the ability of concerned people of different sectors to work together at the conceptual (i.e., between public health scientists and food technologists) and operational levels (i.e., between health services and local complementary food producers).

References


CULTURAL DETERMINANTS OF CHILD HEALTH AND GROWTH IN DEVELOPING COUNTRIES

Bernard Brabin

Introduction

Culture is a complex construct and much of our knowledge about it has been learned from anthropologists. Exactly how culture intertwines with child health involves concepts of ethnicity and race. Anthropologists generally agree that culture in the sum total of attitude traditions and beliefs and includes relationships closely related to family function (1). Culture may be considered as the man-made part of the community which relates to laws, myths, superstitions and family values, but it can also be considered with emphasis on group characteristics, for example: language, tribal groupings, or nationality. Socio-economic status conversely refers to larger social groups categorized on the basis of economic characteristics. Given the substantial similarities in the genetic constitution of "races" significant differences in development and health status among children of different racial or ethnic groups may not be primarily determined biologically (although in some instances this is clearly the case, e.g. inheritance of haemoglobinopathies), but rather by cultural practices and socio-economic conditions (2-4).

Childhood is essentially a cultural experience. It has been suggested that the further back in history one goes, the more likely are children to be killed, abandoned, beaten, terrorized and sexually abused (3). In the medieval period parents treated children like children as well as like adults and there is some evidence that they did so with care and sympathy and that children had cultural activities and possessions of their own (5). During the enlightenment children emerged more as playthings and only privileged groups could afford the luxury of the time, emotion, demands and clothing required to take pleasure in children and to cater for their needs (6).

In the third millennium the child symbolizes a caring society, despite the fact that in many developing countries child morbidity and mortality remain unacceptably high. Some of the harmful customs, traditions and home remedies related to childcare in developing countries are so widespread as to constitute major

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causes of child morbidity and mortality in themselves. A framework for classifying some of these practices is outlined in tables 1-3 and some of these are considered individually in the sections below.

Breast-feeding customs and patterns

In developing countries there is much variation in traditional child-rearing practices which could affect child growth and development. Despite this variation there is relatively little malnutrition and indeed excellent growth during the first six months or so of life in babies of normal birthweight. In traditional societies the initiation and maintenance of lactation is usually successful and is promoted by close and continuing contact with the mother facilitating ad libitum feeding. Close mothering is made easier in many cultures by traditional methods of baby carrying and Jellife described how African languages have the same word for both the amniotic membranes and the backcloths used for carrying babies. For example “nkozi” among the Luganda, and “ingobyi” among the Rwandese (7).

Breast-feeding practices and weaning customs have a direct bearing on nutritional problems in childhood (Table 1). The importance of breast-feeding in late infancy and early childhood varies considerably between developing and industrialized countries as a result of the wide differences in the cultural and socio-economic situations of mothers who choose to breast-feed for prolonged periods. Over 95% of babies in developing countries are initially breast-fed and most children continue to receive some breast-feeding until 6 months of age. After six months large differences in breast-feeding practice between countries are observed.

The limited evidence available suggests that child growth is not influenced by continuing to receive breastmilk after 6 months of age in addition to appropriate amounts of other foods (8). In poor areas of developing countries breast-feeding after early infancy may have a number of major nutritional benefits. Longitudinal studies in Africa and Latin America have provided evidence that the shortest children are sometimes the last to be weaned and low height-for-age and weight-for-age prior to weaning has been shown to remain significantly associated with delayed weaning (9). The habit of postponing weaning of stunted children probably explains why breast-fed children have lower height for age than weaning children in a Senegalese study (10).

The risks of abandoning breast-feeding for artificial feeding is unfortunate and this practice is often lead by more educated
women. Less fortunate, often illiterate mothers have neither the means nor the knowledge to successfully adopt artificial feeding.

Although HIV transmission through breast-feeding is a significant cause of HIV infection, there is no evidence that the risks of child morbidity or mortality associated with artificial feeding have diminished especially in poor communities and breast-feeding promotion should be supported and strengthened in all settings irrespective of the prevalence of HIV (11,12).

**Table 1:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Consequence</th>
<th>Region/Country*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged exclusive breast-feeding with inadequate supplementation</td>
<td>Iron deficiency anaemia, stunting</td>
<td>Africa/Asia</td>
</tr>
<tr>
<td>Sudden withdrawal of breast-feeding</td>
<td>Kwashiorkor</td>
<td>Africa</td>
</tr>
<tr>
<td>Early introduction of infant weaning foods</td>
<td>?Increased risk of HIV</td>
<td>Kenya</td>
</tr>
<tr>
<td>Food avoidance</td>
<td>Nutrient deficiencies</td>
<td>Africa/Asia</td>
</tr>
<tr>
<td>Discarding colostrum</td>
<td>Lowering of gastro-intestinal defences</td>
<td>Indian sub-</td>
</tr>
<tr>
<td>Geophagy</td>
<td>Hookworm infection</td>
<td>East Africa</td>
</tr>
<tr>
<td>Cooking in iron pots</td>
<td>Improved iron status</td>
<td>South Africa</td>
</tr>
</tbody>
</table>

* Known case reports or published studies

**Weaning customs and child health (Table 1)**

During the second six months of infancy, breastmilk continues to be of importance; but as a supplement to other food items introduced during the period of weaning (7). This period is one of the most hazardous in the life of children in developing countries and the earlier this occurs the greater the hazard. In traditional African societies breast-feeding is mostly continued for as long as possible, usually for two or even three years, but if pregnancy occurs breast-feeding is usually terminated. The duration of breast-feeding is thus largely determined by the interval between pregnancies and this is often regulated in traditional societies by customs, which restrict sexual intercourse for varying periods after childbirth. Hendrickse has commented that amongst the Yoruba in Nigeria the age of onset of Kwashiorkor is mainly between two and three years of age (13). This is later than in communities which discontinue breast-feeding earlier. Occasionally “late marasmus” can occur as a result of “breast starvation”. This can develop if the young child is continued on breast-feeding into the second year of life unsupplemented even with inadequate transitional foods (7).
Methods of separation of the baby from the mother's milk vary considerably in relation to infant age and suddenness. Among the Baganda of East Africa, the child is taken from the breast abruptly and sent to stay with a relative, which can precipitate Kwashiorkor ("disease of the displaced child"). The separation may be enforced by the application of bitter substances to the breast (aloes, red pepper or soot)(7). A more gradual process may be followed with special foods as a form of compensation.

The pattern of food distribution within traditional families, which often follow culturally determined patterns, may have significant influences on the recently weaned child in the African setting. Young children may not adjust well to the single meal a day routine, and if left to feed for themselves may not have sufficient dexterity to manage well when "dipping from the same pot". The composition of the meals may be inappropriate for the palate of young children if spicy ingredients are used for flavouring. There is frequently little recognition of the special needs of young children and local taboos may place restrictions on consumption of nutritious food. For example, eggs are regarded as harmful in many countries in West Africa. They are considered to cause children to become thieves, or to delay closure of the fontanel (Yoruba, Nigeria), and to cause too early breaking of the voice in boys and moral laxity in girls (Northern Ghana) (13).

Customs such as cooking foods prepared in iron pots may be very beneficial in preventing iron deficiency anaemia (14). A small number of studies have examined this practice which has been shown to reduce anaemia and iron deficiency in children even in areas where malaria transmission occurs. Improved designs for these pots could improve acceptability in areas where their use is not traditional.

Culture, illness and care

In societies where the extended family is the norm, often young parents are considered too inexperienced to make treatment decisions on behalf of their child and key decisions are made frequently in combination with grandparents, older relatives or traditional practitioners. The care and financial support may also come from the extended family. Societies will differ not only in the central role played by families, but also in their hierarchical structures. Distinct lines for decision making may be drawn between the members of the society.

There is often substantial variability in childcare practices within cultural groups and efforts to homogenize ethnic groups may mask this variability. A study of Haitian American and Cuban
American mothers found that the two groups had a different understanding of the aetiology of illnesses affecting infants and pre-school children (15). The Cuban sample had a westernized approach to early childhood disease and their causes, and they frequently cited giving prescribed medications as the appropriate treatment. In contrast, Haitian mothers did not identify disease or its causes with biomedical terminology. Rather, they described illnesses as caused by external circumstances, such as bad air, dirty objects, or spells. Haitian mothers also listed home remedies more frequently and were more likely to take their child to a traditional healer. Their choices of treatment were based on their own understanding of the causes of the illnesses, and over half did not think the conditions they mentioned were preventable (15).

Some traditional cultures espouse supernatural explanations of problems. Members of these cultures attribute many childhood illnesses to the influence of gods, malevolent spirits and spells. Similarly, some cultures interpret problems as retribution for wrongdoing, either for their own or their ancestors' behaviour. The child in these circumstances may be chastised, cleansed or punished, employing harmful procedures (Table 2). It is also possible, in such circumstances, that families may consider a child's difficulties as fated. In these instances, intervention is often disregarded because it is considered futile.

**Table 2: Harmful procedures**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Condition</th>
<th>Consequence</th>
<th>Region/Country*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhygienic Surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Umbilical cord cutting</td>
<td>None</td>
<td>Neonatal tetanus</td>
<td>Africa/Asia</td>
</tr>
<tr>
<td>Male circumcision</td>
<td>None</td>
<td>Increased hepatitis B or HIV risk</td>
<td>Africa</td>
</tr>
<tr>
<td>Female circumcision</td>
<td>None</td>
<td>Mutilation.</td>
<td>N.Africa</td>
</tr>
<tr>
<td>Skin burning, cautory</td>
<td>Breathlessness; convulsions; Meningitis; jaundice</td>
<td>Skin infection; contractures</td>
<td>W. and E. Africa, Yemen</td>
</tr>
<tr>
<td>Skin scarring</td>
<td>Hepatomegaly, eye infection</td>
<td>Scars and infection</td>
<td>Kenya, Malawi</td>
</tr>
<tr>
<td>Uvulectomy</td>
<td>None</td>
<td>Haemorrhage and infection</td>
<td>N.W. and East Africa</td>
</tr>
<tr>
<td>Removal of teeth</td>
<td>Upper respiratory infection</td>
<td>Local infection</td>
<td>East Africa</td>
</tr>
</tbody>
</table>
Table 2: Harmful procedures (continued)

<table>
<thead>
<tr>
<th>Physical Abuse</th>
<th>Physical Deformity</th>
<th>Asia</th>
<th>Africa, Asia</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tight wrapping of infants</td>
<td>Physical deformity</td>
<td>Asia</td>
<td>Africa, Asia</td>
<td>Global</td>
</tr>
<tr>
<td>Total body clothing</td>
<td>None</td>
<td>None</td>
<td>Africa, Asia</td>
<td>Global</td>
</tr>
<tr>
<td>Child abuse</td>
<td>None</td>
<td>None</td>
<td>Africa, Asia</td>
<td>Global</td>
</tr>
<tr>
<td>Pouring boiling oil on joint</td>
<td>Arthritis</td>
<td>Libya</td>
<td>Nigeria</td>
<td></td>
</tr>
<tr>
<td>Burning (holding child over a fire)</td>
<td>Convulsions</td>
<td>Libya</td>
<td>Nigeria</td>
<td></td>
</tr>
<tr>
<td>Street children</td>
<td>None</td>
<td>Africa, Asia</td>
<td>South America</td>
<td>W.Africa/ India</td>
</tr>
<tr>
<td>Infanticide</td>
<td>None</td>
<td>Africa, Asia</td>
<td>South America</td>
<td>W.Africa/ India</td>
</tr>
</tbody>
</table>

* Known case reports, published studies or personal communications

Traditional home remedies or "native medicines" are sometimes used for a variety of complaints (Table 3)(16). An example is the cows-urine-tobacco concoctions widely used in West Africa for convulsions in childhood which cause central nervous system depression and hypoglycaemia. Other examples are listed in table 1. When herbal medicines are used some of these may be beneficial but many can be harmful. The application of heat or cautery by direct exposure for home management may result in serious injury or deformity. Similarly scarifications and application of harmful substances may cause serious damage to the skin or physical harm to the eye. Unhygienic surgery may have similar results.

Some of the worst management seen in developing countries is attributable to quacks who exploit gullible people who may turn to them in preference to medical services or when medical services are absent (17). Such treatment can seriously delay appropriate interventions by medically trained personnel. The current WHO initiative to improve the care of the sick child - the Integrated Management of Childhood Illness - which aims to improve early diagnosis and management will have reduced effectiveness unless some of these barriers related to traditional practices can either be overcome, or when beneficial incorporated into management strategy.
Table 3: Traditional medicines

<table>
<thead>
<tr>
<th>Practice</th>
<th>Condition</th>
<th>Consequence</th>
<th>Region/Country*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red pepper in eye</td>
<td>Convulsions</td>
<td>Blindness</td>
<td>Sudan</td>
</tr>
<tr>
<td>Cows-urine-tobacco mixture</td>
<td>Convulsions</td>
<td>CNS depression, hypoglycaemia</td>
<td>West Africa</td>
</tr>
<tr>
<td>Eye medicines</td>
<td>Conjunctivitis</td>
<td>Blindness</td>
<td>Africa</td>
</tr>
<tr>
<td>Bowel medicines</td>
<td>Diarrhoea</td>
<td>Intestinal obstruction, dehydration</td>
<td>Malawi</td>
</tr>
<tr>
<td>Fever medicines</td>
<td>Malaria</td>
<td>Late referral</td>
<td>East Africa</td>
</tr>
<tr>
<td>Lactation medicines</td>
<td>None</td>
<td>Acquired prothrombin deficiency causing bleeding in infant</td>
<td>Singapore</td>
</tr>
<tr>
<td>Lead containing medicines</td>
<td>None</td>
<td>Lead poisoning</td>
<td>Arab States</td>
</tr>
<tr>
<td>(cosmetics)</td>
<td>Diarrhoea</td>
<td>Veno-occlusive liver disease</td>
<td>Caribbean</td>
</tr>
<tr>
<td>Bush teas</td>
<td>Sunken</td>
<td>Late referral leading to severe dehydration</td>
<td>Zimbabwe</td>
</tr>
<tr>
<td>Application of anterior fontanelle medicines</td>
<td>Leg or arm fractures</td>
<td>Gangrene</td>
<td>East &amp; West Africa</td>
</tr>
<tr>
<td>Traditional medicines</td>
<td>Snake-bite</td>
<td>Delayed referral</td>
<td>Nicaragua</td>
</tr>
<tr>
<td>Plant snakebite medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Known case reports, published studies or personal communications

**At risk cultural groups**

1) Female child

In spite of the female biological advantage, girls in the developing world appear to have higher mortality risks relative to boys for a given mortality level than was the case historically in the non-developed countries at comparable mortality levels (18). In Bangladesh there is a powerful pattern of parental discrimination against girls. The fact that mortality is much higher among girls with older sisters than among those without suggests that higher female mortality is not primarily a result of cultural practices, which treat all girls differently from boys. Conversely it suggests a selective neglect of individual girls (19). As figure 1 indicates, sex mortality differentials in Bangladesh emerge only after the first half-year of life.
Two hypotheses have been advanced to explain the greater vulnerability of girls:

- Sex differences in childhood for specific causes of death are relatively constant. If girls have higher total mortality it is because causes of death (such as pneumonia or intestinal infections) which are known to have a female excess, are epidemiologically more important in females.

- Gender discrimination, which arises through less adequate nutrition and health care for girls as well as female infanticide.

There is a demographic pattern also observable: that girls have higher mortality rates in countries with low life expectancies, while boys have higher mortality rates in countries with higher life expectancies. The main reason for this is that in high life expectancy countries, death due to infectious diseases is generally low and males predominantly die from acts of violence and accidents. For the same reason, excess female mortality can most clearly be defined amongst children aged 1-4 years, because this is
the age range least dominated by specific male-related causes of
death (including those associated with male deaths in the neonatal
period). The pattern of excess female child mortality is not seen
everywhere - it has been most studied in South Asia and the
Americas. Excess female mortality beyond childhood into
adolescence seems restricted to South Asia, West Asia and the
North African regions. Overall, the evidence suggests that, if total
mortality is not dominated by certain causes of death that
consistently have a male excess, that excess female mortality may
result of discrimination in nutrition and health care.

There is some evidence that childcare practices favouring boys
increases the risk of protein energy malnutrition in an age
dependent way (20). Based on an analysis of cross-sectional
surveys (DHS) from over 20 countries in all regions of the world
there was little difference between the sexes for the underfives in
prevalence of stunting, underweight and wasting. When younger
boys (<24 months) were compared to younger girls, boys tended to
be more malnourished; but with children 24-35 months old there
was an equal or reversed prevalence. This implies that the situation
for girls worsens. After 35 months the sex prevalence of
malnutrition tended to be equal. A higher incidence of Kwashiorkor
among female children has also been reported in Nigeria and
ascribed to their less privileged place in society (16).

2) Social behaviour and rickets

Rickets has been ranked among the five most prevalent
diseases in developing countries. Cultural factors in the aetiology of
rickets are of considerable importance. Rickets is caused by a lack
of vitamin D, which leads to a severe disorder of bone growth and
subsequent growth failure. These children are also more susceptible
to infectious diseases including tuberculosis. Vitamin D is obtained
from dietary sources and can be synthesized in the skin. In view of
this it would seem unlikely that rickets would occur in tropical
Africa. Yet it has been described recently in Nigeria, where it was
related to both vitamin D and calcium deficiency (21). In Western
Nigeria, North Africa, Ethiopia, Pakistan, Yemen and parts of the
Middle East it occurs amongst the children of Moslem members of
the community and is due to the practice of purdah which requires
women to totally cover their skin from the eyes of any man but their
husband. Infants born to these women are denied adequate
exposure to sunlight and their diets are often also deficient in
vitamin D and calcium and in consequence they frequently develop
rickets. In Ethiopia a fair skin is prized and parents may go to
elaborate lengths to ensure that their babies are not exposed to the
tanning effects of sunlight. Sub-clinical deficiency may be common and in a recent survey amongst Somalian immigrant girls and young women (10-25 years) in Merseyside, UK, 87.2% had abnormal blood biochemistry indicating rickets.

3) Ethnic minority children

The problems of this group have been reviewed by Aukett and Wharton (22), who indicated that it is often difficult to decide how much of the nutritional problems of these groups are due to their ethnicity and cultural practices and how much to other social and economic factors such as poverty. It is difficult therefore to assess whether ethnic group membership places children at greater risk than the general population because of the inter-relationship with poverty and low socio-economic status. For some specific diseases ethnic minorities may be at special risk (e.g. hepatitis B infection) (23).

There are many sub-ethnic differences in the diet of children of mothers from the Indian sub-continent. Particular nutritional problems worth highlighting include growth faltering, rickets and iron deficiency anaemia amongst Asian immigrants to western societies. Amongst Chinese and Vietnamese cultural food traditions can be very strong and rickets and iron deficiency are well described.

4) Polygyny: an indicator of nutritional stress

A number of nutritional surveys have tried to assess the influence of polygyny on the incidence of malnutrition, however polygyny varies widely between societies in its presentation, distribution and intensity and controlling for all those factors is difficult (24). Resources within polygynous societies may be distributed to the detriment of women and children. Curley compared smallholdings and receipts of monogamous and polygynous wives and found that a man who maintained one household built larger buildings and maintained them better than a polygynist (25). Also since agricultural produce was not divided, the single wife had more chance of gaining and retaining a cash income. Most importantly a wife in a polygynous household was given a smaller size plot of land to work than a monogamous wife. A detailed examination of polygynous households is necessary to elucidate the process by which women fulfil their responsibility of food provision - a responsibility that continues when economic processes change the division of labour and the traditional patterns of producing goods.
5) Twins in Africa

The twinning rate is about one in twenty births among the Yorubas in Nigeria. It is extremely low in most other African people, sometimes as a result of perinatal infanticide through neglect of the weaker twin, as it may be difficult to successfully breast-feed two infants. The Yoruba term for twins is ‘Ibeji’. All twins are named Taiwo and Kehende. The first born is Taiwo, but in contrast to custom in the West, Kehende, the second born is the senior twin as the first born is regarded as clearing the way for the second. Amongst the Zulu’s there is a tradition that as soon as the second twin in is born the husband goes to the forest and selects two small Euphorbia trees and plants them on the women’s side of the hut. The twins are carefully washed in a tincture of ground Euphorbia root. The Euphorbias must not be injured for fear of endangering the life of the twin to whom the tree belongs.

Traditionally little wooden carvings called Ibejis were made to represent twins. If a twin dies, then its Ibeji is treated in the same way as the living twin to avoid jealousy, which could harm the survivor. Most Yoruba now appear to be able to resolve the conflicts inherent in the twin-birth situation, so the event is less of an interruption of normal social life than in the past (26).

The survival rate of twins has been little studied in developing countries and there is a scarcity of information available on their growth patterns. There are high risks of transmission of infections between twins, for example tuberculosis and measles and the second born twin is at higher risk of acquiring perinatal infection with HIV. Both neonatal and infant mortality rates are several times higher among twins than singletons and gender differences in mortality are evident. Vitamin A and β-carotene maternal supplementation appears to increase the rate of twinning (27).

Conclusion

The high incidence of nutritional disorders especially in Africa today reflects the interaction between social, cultural and biological factors influencing child health and growth. Policy approaches to improving child health and care should ideally develop from a cultural basis. A cultural reasoning can lead to the introduction of programmes before the chain of events to which malnutrition has been a response has been properly assessed. Innovative methods will be required for the development of culturally successful interventions, especially in areas with high levels of illiteracy.
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CURRENT AND HYPOTHESESIZED PSYCHOSOCIAL INDICATORS OF “CARE FOR NUTRITION” (CAREGIVING BEHAVIOURS AND INTERACTIONS THAT OPTIMIZE THE CHILD’S USE OF FOOD)

Jean-François Bouville

Introduction

In environments with limited food and health resources, child growth and development depend to a greater extent on the caring behaviours of the child’s caregiver(s). Care is generally defined, in this context, as the household provision of time, attention and support to meet the physical, mental and social needs of the growing child. Psychosocial aspects of “care for nutrition” include specific characteristics of the child-caregiver relationship, feeding styles and support system associated with the child’s nutritional status. Although many studies suggest that malnutrition occurs in conditions where psychosocial care is inadequate, no consensus has been reached to date on specific indicators, causal links and pathways.

We will briefly review currently used psychosocial indicators of “care for nutrition” and suggest others based on a recent longitudinal study of the functional home environments (daily interactions, feeding patterns, and family context) of 32 children aged 6 months to 2 years in Abidjan, Côte d'Ivoire. Among these children, 25 were observed before the onset and during the evolution of potential nutritional symptoms in several neighbourhoods with high levels of slight to moderate malnutrition (every 6 months – or less depending on the family's availability - for 2 consecutive days, 10 hours a day), and 7 others with severe malnutrition were met at the hospital and observed once or twice in the same conditions at home in their second year. Results suggest four sets of psychosocial care indicators associated with specific types of child nutritional development. Potential assessment methods and intervention strategies based on these results will also be discussed.
Concepts and purpose

For many children, malnutrition describes the endpoint of a process that involves medical and nutritional as well as psychological and social influences. There is much evidence of an association between malnutrition and stressors in the family environment and in parent-child interactions (1,2). Care is defined as the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of the growing child. It is increasingly recognized as an important determinant of good health and nutrition among pre-schoolers, along with food security, availability of health services and a healthy environment (3). Although many studies suggest that child malnutrition occurs in conditions where psychosocial care is inadequate, no consensus has been reached to date on specific indicators, causal links and pathways (4).

Psychosocial care for nutrition refers, more specifically, to caregiving behaviours and child-caregiver interactions associated to child nutritional outcome through their influence on the child’s use of food. As Engle and Ricciuti (5) recently wrote, “psychosocial care and nutritional care are closely interconnected in the routine caregiving of everyday life and thus should be considered holistically (...) in a unique pattern of behaviours that develops over time.” Our purpose is to identify these set patterns of child-caretaker relationships at risk for child malnutrition. A better understanding of the determinants of psychosocial care for nutrition could help improve existing assessment and intervention practices.

Current indicators

Many psychosocial care indicators are empirically associated to child nutritional outcome, but they generally don’t provide an understanding of how they relate to one another or to child food intake. Indicators based on individual behaviours are often culture and age specific. Western standards usually predominate, such as mother “shows affection by smiling and friendly behaviour”, “rewards achievement”, “reprimands without being brusque”, “creates a stimulating physical environment for the child” (6), or infant “lack or decreased vocalization”, “lack of cuddliness”, “poor eye contact”, “lack of smiling response” (7). These indicators would scarcely apply in most African settings, for instance, where physical interaction is usually favoured above verbal or visual interaction, mothers keep infants in close proximity most of the time (8), and
infant manipulative exploration and use of passive or signaling attachment behaviours take precedence over more active proximity-seeking or following behaviours (9).

Many indicators of the widely used Home Inventory (10), which is based on a configuration of specific caregiving behaviours such as “verbal responsivity”, “avoidance and restriction of punishment”, “provision of appropriate play materials”, “opportunities for variety in daily stimulation”, are still somewhat ethnocentric, but also specific, furthermore, to the situations described (no indication of the ways in which these behaviours affect child nutritional outcome). Caregiving models seem more universal in scope, as they consider the quality of the caregiver’s behaviours during interaction with the child instead of the actual behaviours involved. A wide range of culture-specific caregiving behaviours can indeed apply to the growth-promoting relational construct described by Engle and Ricciuti (5): caregiving responsiveness, warmth and affection, acceptance, involvement with the child, encouragement of autonomy and exploration. The question remains, however, of the ways in which these relational qualities are actually implemented in varying situations and cultural contexts, as well as the behavioural processes involved in enhancing or undermining the child’s nutritional development.

Contextualization of behaviour

Hence many current psychosocial care indicators are, to some extent, culture-, age- and situation-specific, which limits their use in other contexts. The assessment of caregiving relational quality best approximates the cross-cultural, developmental and ecological indicators we are searching for. Our main objective is to find a way to widen the scope, or “contextualize”, the behaviours associated with these caregiving qualities.

Attachment theory, founded by John Bowlby (11,12) and later developed by Mary Ainsworth (13,14), provides a wider organizational construct in which to contextualize both caregiving and child behaviours. Very briefly stated, attachment theory considers the fundamental organizing principle of human behaviour to be the overriding need for protection and emotional security. In other words, the child needs attachment security, defined as the state of being secure or untroubled about the availability of the main caregiver. The perceived unavailability of the caregiver leads to insecure attachment.

The four main child-caregiver attachment patterns differ according to a predictable interplay between child proximity seeking
to the attachment figure(s) (mother and other main caregivers) and his/her exploratory behaviours during an experimental situation in which the child is confronted to gradually longer periods of separation (14). Attachment relationships are either:

- Secure - infants use their mother as a secure base for exploration;
- Avoidant - infants explore but avoid their mother when distressed;
- Resistant - infants seek constant proximity to their mother mingled with anger;
- Disordered – infants neither explore nor seek proximity to their mother or show signs of fear towards her (freeze and/or cry in her presence) and behave erratically during the Strange Situation procedure (seemingly unfocused and sudden changes in several of these behaviours).

It is important to underscore the fact that insecure attachment relationships are very widespread in the non-clinical, general population, since 20 to 40% of samples (throughout the world, even though most studies were conducted in Western middle-class settings) are found, on average, to be either avoidant (10-20%) or resistant (10-20%) - attachment disorder alone (5-10%) is indicative of psychopathology (15). Furthermore, much higher levels of insecure relationships are found in “at-risk” populations (68% in a low-economic Dutch sample, for example (16)).

**Hypothesized ecological model**

Working on naturalistic attachment patterns among the Dogon of Mali, McMahan True et al. (8) stated that the most dramatic demonstration of the adaptive value of attachment security was its role as a protective factor against malnutrition. Other authors, such as Dixon, Levine and Brazelton (17), for example, long ago identified malnutrition as a symptom of a disorder of attachment, and a recent study conducted in Chile (18) reports an empirical link between insecure attachment and malnutrition.

In an attempt to better understand underlying behavioural and relational factors of child malnutrition, we recently conducted a longitudinal study (19) on the naturally occurring attachment patterns and feeding interactions of 32 children aged 6 months to 2 years in the multiethnic urban population of Abidjan, in Côte d'Ivoire. 25 of these children were observed before the onset and during the evolution of (potential) nutritional symptoms in several neighbourhoods with high levels of slight to moderate malnutrition.
(observations every 6 months for 2 consecutive days, 10 hours a day), and seven others with severe malnutrition were met at the hospital and observed once or twice in the same conditions at home in their second year. Early interactions, before the onset of nutritional symptoms (at 6 months of age) were the most strongly associated with subsequent nutritional outcome.

Based on the results of this study, we devised a hypothetical model of the link between global interactions, feeding interactions, food intake and child nutritional outcome (see Graph). Children who remained healthy from a nutritional standpoint benefited from a secure relationship with their mothers, associated with maternal sensitivity – the appropriate response to the child’s signals and demands in a timely manner. This secure base allows, as we previously mentioned, the child’s exploration of the environment, including the realm of food diversity. Hence the child accepts to eat, and food intake is adequate.

**Graph: Hypothesized psychosocial care for nutrition model**

<table>
<thead>
<tr>
<th>Attachment disorder</th>
<th>Global interactions</th>
<th>Feeding interactions</th>
<th>Food intake</th>
<th>Nutritional outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Attachment</td>
<td>M. sensitive I. explores env.</td>
<td>M. sensitive I. explores food</td>
<td>Adequate</td>
<td>Healthy</td>
</tr>
<tr>
<td>Insecure avoidant</td>
<td>Overstimulation I. &quot;to himself&quot;</td>
<td>M. overprotective I. picky eater</td>
<td>Irregular (selection)</td>
<td>Stationary weight</td>
</tr>
<tr>
<td>Insecure resistant</td>
<td>M. unresponsive I. ambivalent</td>
<td>M. force-feeds I. opposition</td>
<td>Low (refusal)</td>
<td>Slight/moderate malnutrition</td>
</tr>
<tr>
<td>Attachment disorder</td>
<td>M. disengaged I. apathetic</td>
<td>M. laissez-faire I. disinterest</td>
<td>Very low (parsimony)</td>
<td>Severe malnutrition</td>
</tr>
</tbody>
</table>

Children with *stationary weight* (for three months or more during the first two years of life) participated in an avoidant attachment relationship in which their mothers were somewhat intrusive, excessively stimulating, and strongly overprotective. During the feeding situation, it was not uncommon for mothers to follow the child around with a spoon to feed him/her when distracted. These behaviours were often seen after an early period of force-feeding during which these children often became overweight,
so their picky eating and stationary weight during their second or third semester of life might actually be adaptive.

Children who suffered from slight to moderate malnutrition mostly had resistant attachment behaviours related to an unresponsive, underinvolved approach to caregiving. Mothers tended to actively reject or ignore their child in distress while he/her almost constantly required close physical contact, resisted being put down, and showed excessive fear of strangers. They also took a longer time to respond to the child’s demands, seldom approached him/her spontaneously, and rarely partook in social interactions such as playing or exchanging without a specific physical need to be met. Mothers were “busy elsewhere”, as it were, and sometimes treated their clinging and angry child as a burden. Meals were to be quickly dealt with by force-feeding, but the child usually resisted this lack of attention to his/her emotional needs by actively refusing to be fed, leading to a low level of food ingestion.

The attachment relationship of children with severe malnutrition seemed difficult to establish; an attachment disorder characterized by little emotional engagement between mother and child (both are somewhat passive, aloof and apathetic) despite the mother’s continued physical presence. These children showed very little fear of strangers, and generally “accepted” to be held and even taken some distance by unknown people (unlike avoidant children). Lack of emotional contact with mother also puts food at a distance, so to speak, and children behaved as if they were never hungry, eating a bite here and there but never more. Mothers either passively “accepted” their child’s anorexic behaviour without trying to bring him/her to eat, or attempted to force-feed him/her at times without insisting on a regular basis or during an entire meal. Hence the child’s food intake was very low.

Assessment and intervention

Child malnutrition programmes could greatly benefit from a better understanding of these specific behaviours and interactions associated with the onset and evolution of symptoms. Their assessment and intervention can be considered together, to some extent, since taking the time and the energy to observe the relationship, asking the mother informed questions about it, listening to her answers, and pointing in a non-judgmental way to possible courses of action are all ways to provide attention and acceptance to the child and caretaker’s emotional needs. It seems vitally important in developing countries that this type of community caring also include other caretakers than the mother,
such as the child’s older siblings and aunts, for instance, to help provide the time and attention children need to grow. Social interactions with the child are very important in this respect, and were often found to be associated with positive nutritional evolution in our longitudinal study. These playful and cuddling interactions can help alleviate insecure attachment patterns by providing a secure base for the child’s exploration of the environment, including the realm of food diversity.

Other prospective empirical studies conducted on a wider scale in various settings would help refine and culturally adapt hypothesized psychosocial indicators of care for nutrition. Several assessment methods of global and feeding interactions could be used in this process such as Chatoor, Getson and Menvielle’s (20). Feeding Scale (distinction between several attachment-based early feeding disorders), Water and Dean’s (21) Attachment Q-Sorts (assessment of child attachment patterns in natural settings), and the McMahan True et al. (8) Baby Weigh-In Examination (assessment of mother-infant communication patterns during the well-baby weighing procedure). This last assessment method also interestingly provides both the possibility for relational assessment and an informed basis for dialogue with the child’s caretaker during a widely-used standard growth monitoring procedure.

References

AN ETHNOGRAPHIC STUDY OF THE InfluENCES ON MATERNAL Decision-Making ABOUT INFANT FEEDING PRACTICES IN RURAL BANGLADESH

Purnima Menon¹,Nazneen Akhtar², Jean-Pierre Habicht³

Introduction

Bangladesh has some of the highest prevalences of young child malnutrition in the world. The overall prevalence of stunting, underweight and wasting among children less than 36 months of age are 49%, 54% and 21%, respectively (Figure 1).

The trends in these indicators by age indicates that the prevalence of stunting almost doubles from about 30% among children between 6 and 11 months of age to 57% among children 12 and 36 months of age. Similar patterns are seen for both wasting

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and underweight. These patterns reflect the vulnerability of children between 6 and 36 months of age and are indicative of deterioration in nutritional status that are likely due to a combination of poor feeding practices and high disease rates.

Previous research on infant feeding practices in Bangladesh has documented almost universal breast-feeding rates with long duration (up to 2 years of age), but low rates of exclusive breast-feeding and poor complementary feeding practices (1,2). While a number of studies have documented breast feeding and to some extent, complementary feeding practices of mothers of young children in Bangladesh, there are few studies that have examined these practices in a socio-cultural context with an emphasis on understanding the various influences on decisions that mothers make about caring for their infants. In order to be able to influence behaviour change, it is critical to understand the process of formation of knowledge and the factors that influence the translation of knowledge into action.

This ethnographic study was part of a larger study to understand the mechanisms through which maternal schooling affects child health. It is based on findings that in a similar Bangladeshi population, children of better-educated mothers were better nourished that children of women with less or no schooling. Also, it was shown that this influence was partially mediated through caring behaviours such as child and maternal cleanliness (3). This qualitative study was undertaken to document the differences in caring behaviours of women with different levels of schooling and to understand some of the mechanisms through which schooling might have contributed to those differences, in the process collecting data about decision-making around infant care practices. This paper will report the general findings related to infant feeding practices and outline the broad decision-making framework that appears to operate in this context.

Figure 2 lays out the conceptual framework used to guide the ethnographic research. This framework assumes that maternal characteristics will interact with household characteristics to influence the knowledge base, attitudes and feeding choices that a mother will make for each of her children. Examples of maternal characteristics are maternal schooling, age, and previous childcare experiences while examples of household characteristics include household resource availability, family composition, and education levels of other household members. Other factors that can be expected to influence maternal knowledge and attitudes are information from books, radio and television on child feeding and care.
Figure 2: A conceptual framework for the qualitative investigation of factors that influence childcare practices.


- Maternal characteristics (schooling, age, previous experience)
- Household characteristics (resources, family composition, etc.)
- Media (books, radio and TV)
- Attitudes, knowledge and choices re. infant feeding and ability to act on those choices
- Child care practices (feeding, care during illness, early childhood education)
Methods

This study was conducted in Kathali village, which is located in Bhaluka thana, about 80 kilometres northeast of Dhaka, the capital of Bangladesh. This thana was selected after extensive discussions with programme officials at the Bangladesh Rural Advancement Committee (BRAC), an NGO that has a widespread coverage in the country. In order to understand the influence of maternal schooling on caring practices, it was important to select a site that had experienced minimal contact with NGO health programmes, since such contact could have decreased the variability in practices in the community. The BRAC office in Bhaluka had been operational for less than five years, and did not have an extensive health outreach programme.

Within the programme area, the village of Kathali was selected for its proximity to the area office, the highway and ease of access. Roads in the area were poorly developed and since it was a highland area, access via boats is not possible, as it is in lowland areas. The village of Kathali stretched from the highway to about 5 kilometres inland and was accessible primarily by rickshaw or on foot. Selecting a more remote site would have increased the travel time to the research site from and enabled less close contacts with the study participants.

Sample selection

In order to ensure that interviewees were selected from all Socio Economic Status (SES) and schooling levels within the village, we used two participatory rural appraisal (PRA) techniques called social mapping and wealth ranking. The village was naturally divided into a number of clusters of about 50 households, called paras. The PRA exercises were conducted in five paras. The social mapping exercise is a group activity and it was used to generate a list of all households in a para with the help of a number of villagers representing various socio-economic levels in the para. For the wealth ranking, the group was asked to sort a pile of index cards with the names of the household heads on it into different groups based on their wealth status. They then identified each group (e.g., "bhalo chale", meaning "goes well", for the wealthiest group) and described the characteristics of each group in terms of household food security, household structure, possession of livestock and poultry, and types of employment.

Primiparous women (n=20) were selected to be interviewed from different SES and schooling groups within each para.
Primiparous women were interviewed because it is expected that women’s experiences with their first child would influence feeding and care practices substantially for their second child. From a research perspective, we wanted to ensure that the primary relationship we were exploring, i.e., between maternal schooling and caring practices, was not influenced by maternal childcare experience.

Data collection

Data on the influence of maternal schooling on childcare outcomes was gathered primarily through in-depth interviews with individual women. The interviews followed a feeding and childcare history format, with probes to understand the factors that influenced each major decision about feeding and care during illness. A research assistant conducted the interviews in Bangla. All interviews were taped, then translated into English and transcribed. The research assistant was trained to give literal translations of the taped interviews, rather than interpretive translations based on her understanding of the interview.

In addition to the in-depth interviews, other data collection methods used were free-listing exercises to list foods that were considered appropriate and were commonly fed to children of different ages, interviews with key informants and older women, observations of child and household cleanliness and a number of group discussions with women and men.

Interview themes

The in-depth interviews were conducted in the form of feeding history interviews, starting with initiation of breast-feeding and ending with transition to adult diet (depending on age of the child). The interview guide for the feeding history interview was adapted from the exploratory phase interview guidelines in the TIPS manual (4). All questions relating to feeding decisions were followed up with probes to understand who or what influenced each action. The interviews also included questions related to care seeking during the last illness episode (with a focus on diarrhoea/acute respiratory infection). Questions were designed to elicit information about what was done for the last illness episode, when it was done and who took the decisions relating to care during the illness episode. Data analysis was done using Atlas-ti (5) for the qualitative interview data.
Results

Description of the study setting

The village is situated eighty km north east of Dhaka and high on the banks of the Bhaluka river. This village is bounded on the northern end by the Bhaluka river, a tributary of the Padma river, on the west end by the Dhaka-Mymensingh highway. Its southern and eastern ends are contiguous with neighbouring villages. The area is designated as a highland area. Many villages in Bangladesh are situated in lowlands, or close to major rivers that spill over their banks during the rainy season and flood the villages on their banks repeatedly.

Like the majority of villages in Bangladesh, the community structure in Kathali consisted of a number of “paras”, clusters of up to 50 households that are situated close to one another, but separated from the next para by an easily distinguishable tract of land or water (e.g., paddy fields or streams). This is depicted schematically in Figure 3. The main marketplace was situated in Bhaluka town, one kilometre north of the village, along the highway and across the river. In addition to grocery stalls, the market had a number of shops that sold dry goods, clothes, shoes as well as small pharmacies and doctor’s offices. Most, if not all, of the shopkeepers, doctors and pharmacists were men. Women were seldom seen in the marketplace, and when they were visible, they were mostly visiting the doctors.

Description of sample

The village mapping and wealth ranking exercises revealed the range of wealth and possessions in the village. At the extreme of poverty were households with no landholdings even for their homestead, which lived in the most rudimentary of houses (mud walls and floor, with thatched roofs), owned no livestock or poultry and who had to borrow money from lenders to make ends meet. At the other end of the wealth spectrum were households that owned large tracts of farming land, livestock, who had surplus grain at the end of the year, and who lived in houses with glazed floors and tin roofs.
The average age of the mothers interviewed was 19.6, with a range from 18 to 26. Their years of schooling ranged from none to 16 years, with a mean of 5.75 years. Only one woman had attended a non-formal schooling in addition to three years of formal primary schooling. The mean years of schooling for husbands was lower, only 4.4 years. The age of the husbands ranged from 22 to 37 years, with a mean of 28.5 years. In general, husbands were substantially older than their wives (mean difference = 8.8 years, range = 4 to 14 years). This difference in age could be responsible for the lower levels of schooling among the husbands since government programmes to promote school attendance had only been operational for the last 5-10 years.

Only two of the women were employed outside the home. Of these, one was a schoolteacher and the other worked in a garment factory. Six of the twenty mothers were involved in NGO activities and had taken loans from local NGOs for income-generation.
projects (small-scale grain mill, livestock or leasing land to farm). The loans were primarily used by their husbands (in all cases but one). All the families were Muslim. There were a few Hindu households in the village but none of those households had Primiparous women with children in the age range of 6-36 months. The total number of people in the household ranged from 3 to 12 (mean = 4). The total number of people in the homestead ranged from 3 to 40, with a mean of 12.3. Six households did not own any land and lived on other people’s lands; seven owned the land on which their homes stood. The remaining owned enough land for their homesteads and for farming.

Forty percent of the children were female. Children’s ages ranged from 6 months to 36 months of age, with a mean of 17 months (SD = 9 mo).

Caring practices

This section will describe the caring practices of the overall sample of women interviewed. In spite of the small sample size, the results will be presented in terms of proportions, rather than actual numbers. Also, the influences on specific feeding practices will be discussed, with implications for interventions.

Initiation of breast feeding and breast feeding practices

Prelacteal feeds were almost ubiquitous in this community and only 20% of the infants had never been given prelacteal foods (or foods around the time of the initiation of lactation). Honey, sugar water and cow’s milk were the common prelacteal foods and 50% of all children had been given honey. Forty five percent of the children had been given sugar water and 50% of the children had received cow’s milk. The prelacteal feeds were mostly given to the new-born infant by an older woman (a mother, grandmother or mother-in-law) in all but one case. The most common reasons cited for giving prelacteal feeds to new-borns were that the infant’s throat would be dry, that honey makes the child’s voice sweet; and finally that since there was no breastmilk in the first few days, they needed to feed the child something so that it would not be hungry.

Fifty-two percent of mothers reported that they put the baby to the breast within 2 hours but the remaining did so only after 1 day or more. The commonly stated reason for the delay in putting the child to the breast was that the women believed that there would be no breastmilk in first few days and hence, it would be pointless to put the child to the breast.
All children but one were currently being breast-fed. This pattern is concurrent with previous research that shows prolonged breast-feeding in Bangladesh. However, most women had not practiced exclusive breast-feeding and a majority of women reported giving the child at least some water after it had been breast-fed (70%). Almost all the others at least gave a few drops at bath-time. Many women and especially older women articulated a belief that children needed to be given water since they did not have the ability to ask for water on their own if they felt thirsty. The amount of water that was reportedly given to infants ranged from few drops once a day at bath-time to sips of water throughout the day. The sources of water in the village were primarily from tube wells.

Introduction of new foods

The first food that was commonly introduced to young infants was a rice (or semolina) gruel made with water and sugar. Mother reported that they prepared a thin gruel (“like milk”) for young infants, (3-4 months old) and fed them a thick gruel when they were slightly older. The thin gruel was often fed using a baby bottle and at least one half of the children had been fed using a baby bottle. The thick gruel was fed using a spoon or by hand. Sometimes cow’s milk was added to the gruel but only a small proportion of mothers reported that they could afford to add cow’s milk to the gruel.

The infants ranged from few days old to few months old (1 – 7 mo, majority around 3 mo) when gruel was introduced into their diets. The gruels were usually fed upon the advice of other older women in the household and the para. The most commonly reported reason for introducing a rice or wheat gruel was that the infant’s stomach was not getting full with breastmilk. This was based on the infant crying excessively. Only 20% of the mothers reported that they fed the child a complementary food around 6 months of age because they knew that the infant needed extra food at that age.

At the time of this study, a local traditional complementary food called khichuri was being promoted widely through the media (radio and TV) and by community health workers. Khichuri is a mixture of rice, lentils and vegetables and/or meat cooked together until it reaches a soft consistency. A number of the women reported that they had cooked this at least once for their child, and only 20% reported feeding khichuri regularly to their child between the ages of 6 and 12 months of age. Another 10% had fed it regularly between 6 and 9 months of age, but started feeding the infant family foods around 9 months of age. A few had tried feeding the khichuri once
or twice and then discontinued it because their infants did not react positively to the new food (15%).

There was a perception that while khichuri was a highly desirable food for young children; it was difficult to prepare because a large number of ingredients were required. Twenty percent of mother explicitly stated that they thought they could not afford to make khichuri for their children and this concern was also articulated in two of the focus group discussions with older women and men. The health care messages that promoted khichuri on TV and radio included a number of vegetables like cauliflower, pumpkin, peas and carrots, which were expensive for the villagers to procure and not available at all seasons. This appeared to lead to the perception that it would be difficult to prepare this food on a regular basis for a young child. It is interesting, and encouraging, to note that even though it is rice-based, khichuri is perceived as being different from a rice-based meal since it is a food that was specially prepared for young children (see section on rice based meals below). It would seem that minor modifications to the way in which it is promoted could improve the compliance with programme messages.

Infants were also fed a range of other foods between the ages of 4 to 12 months. These included foods called “maja” and some fruits. Foods classified as maja foods were small treats (e.g., candies, a local snack called chanachur, biscuits and pieces of bread) that were fed to children by a number of other household members. Fruits that were fed to children in small amounts were grapes and oranges. These were perceived as highly desirable fruits and were expensive. A number of these foods were not fed to the child by the mothers, but by other children and adults in the neighbourhood. Buying treats for children was seen as a common expression of fatherly affection and many fathers had bought these foods for their infants as early as 4 months of age.

**Transition to an adult diet**

Rice is the staple food in Bangladesh and usually is consumed with a spicy vegetable or fish preparation. When asked about the timing of feeding rice-based meals to infants (including rice mashed with salt, rice with green vegetables and rice with lentils or fish), responses ranged from 6 – 24 mo. Four of the mothers reported that they had introduced rice before the child was a year old and the remaining reported that they fed the child rice based meals only after 12 months of age. Reasons cited for late introduction of rice was that the child would get a potbelly and skinny legs if it were fed rice before 12 months of age. For some women, this perception was
based on advice from mothers or mothers-in-law, but for some others it was based on observations of young children who had developed a potbelly and skinny legs after their mothers had introduced rice into their diets. Women also discussed that one of the norms for perceived readiness for rice based meals was when a child reached out for or grabbed rice and/or other foods from their parents’ plate.

Frequency of feeding and dietary diversity of meals

Feeding frequency was estimated from the 24-hour recall and dietary diversity from the food frequency questionnaire. While all infants were breast-fed on demand, the frequency of feeding snacks and meals was low. As is common in other developing countries, children were mostly fed at adult mealtimes, and only 3 children were fed more than 4 times a day. The adult meals were 3 times a day: an early morning breakfast, a late afternoon lunch and a late evening dinner. Most children were fed the early morning and late afternoon meals, but many mothers reported the child fell asleep before the evening meal and therefore, was not fed at that time. Only a few mothers (15%) reported making a special effort to feed the child before the family’s evening meal so that he or she would have eaten before bedtime. However, this was an uncommon occurrence. Dietary diversity depended on the availability of different foods in the households and this was rarely under the woman’s control since most household shopping was done primarily by men. The foods that they brought back were dependent on the resource availability of the households and often on their own preferences.

Encouragement to eat

In the course of the in-depth interviews, mothers were asked what, if anything; they did if their child refused to eat what they wanted to feed it. The responses to this question were encouraging and only one mother stated that she didn’t do anything to encourage her child to eat. The responses from the other women ranged from trying a number of different foods (40%) and being persistent in trying to get the child to eat (35%). These included playing games with the food, walking around with the child to distract him or her, singing songs, distracting the child by showing him birds or other things and feeding him while distracted. A small proportion of mothers also indicated that they had tried to force-feed the child (10%). On the whole, however, there was a belief that children needed to be fed using a variety of methods if they did not eat what was first offered to them. This is different from other
cultures (e.g., Mali) where children are not encouraged to eat if they refuse (7) and is encouraging in terms of its implications for nutrition interventions.

The analysis of the 24 hour recalls showed that the initiation of feeding episodes was passive in general and most mothers reported initiating a feeding episode in response to perceived hunger cues like crying, rather than on a schedule. Relative to encouraging children to eat if they rejected certain foods, they articulated a belief that children had to be “made to eat”, but it appeared that this belief did not manifest itself in regular feeding habits. This lack of structuring of meals could go along with the cultural belief that food is “to fill the stomach” rather than to help a child grow.

The transactional nature of care

A primary influence on maternal decisions about foods to re-offer to their child after the food had been rejected once was the reaction of the child to the food. While mothers differed in their statements of how soon they would re-offer a new food that had been rejected by their child, it was clear that the child’s reaction was important in the decision-making process. Women did not see any advantage to preparing and trying to feed their child foods that he or she rejected because of the taste or consistency. Women also reported that if their child rejected a certain food, they would have to prepare something else (usually a gruel) to feed the child, and that this was a time-consuming process. It is possible that one of the reasons the sweetened rice gruels are so widely used is that it was uniformly accepted by infants. Feeding children green vegetables and khichuri appeared to take more persistent feeding on the part of the mother.

Discussion

Feeding practices

We have shown in this study that prelacteal feeding is still widely practiced in rural Bangladesh, in spite of numerous breast-feeding programmes. However, the feeding of prelacteals is not done by the mother, and it is possible that targeting mothers alone to change this behaviour will not be effective. Exclusive breast-feeding is almost negligible and giving water after breastmilk or during the child’s bath is a deeply ingrained practice. Also, early complementation with low nutrient-dense starchy gruels is a serious concern; if breast-milk insufficiency (perceived or real) is indeed a reason then further research is needed to understand this
phenomenon better, with an emphasis on understanding the psychological, physiological, and possibly nutritional reasons for it.

We have also found that introduction of rice-based meals was delayed for a majority of children to after 12 months of age and that the belief system around not giving rice before 12 months is strong. However, mothers were willing to feed their child the highly promoted local complementary food, and modifications to the way in which khichuri is promoted could increase its use as a complementary food. Media messages related to khichuri were widely seen and heard but comprehension is a problem.

Feeding frequencies were low and children were fed mainly at adult mealtimes. Also, feeding appeared to be mostly passive in that foods are given (or even cooked) only when children cry from hunger. While this is an appropriate response for young children (e.g., breast-feeding on demand), one would expect that with older infants and young children, mothers would be more proactive in initiating feeding episodes with the aim of ensuring frequent and adequate food consumption.

Influences on feeding practices

Our study indicates that women juggle a variety of influences in the process of making decisions about what to feed their young children, when and how to feed these foods. These factors are laid out in Figure 4 in a revised framework that elaborates on the steps that lead to the final decision about foods that are offered to children. According to this framework, women obtain information on infant care and feeding from a number of sources, for example, from television and radio messages, books, and most importantly from the older, more powerful members of their households, e.g., mothers-in-law, mothers and other older women. Other sources of advice were doctors and community health workers. The information from all these sources is then evaluated in light of the women’s own knowledge, confidence, and the choices that are available to her.

Household food availability was a key determinant of the types of foods that mothers were able to feed their young children. Household food purchasing was done predominantly by men mostly according to their perceptions of family needs. Snack foods (biscuits, a spicy fried lentil mix, candies) were bought for the child by fathers, uncles, grandfathers, often from when the child was about 6 mo old. These foods were often fed to the infants by other household members (other children, fathers, grandfathers, etc.), and there was little maternal control over this practice.
Another important, and hitherto not well studied, influence on maternal feeding decisions was the reaction of infant itself. In this study, mothers reported basing their decisions about introduction of complementary foods on infant behaviours such as persistent crying. Also, decisions about what foods to continue to offer to infants after a first trial were often based on maternal interpretations of their infants’ reactions. While the theoretical understanding of the transactional nature of child care is well
developed (8), the research on understanding the nature of these relationships is still slow in coming. There is some evidence that mothers alter their feeding patterns based on child illness (9), child appetite, health and nutritional status (10-13). However, more work is needed to deepen our understanding of the process of the development of these relationships. More importantly, programmes that address feeding behaviours will have to develop methods to help young mothers understand and deal with infant reactions to changes in their feeding behaviours.

Methodological issues

Although this study is a small in-depth qualitative study, we believe the results are generalisable to similar rural Bangladeshi population groups that have not been exposed to intensive health education programmes. Throughout the course of the study, the preliminary findings were discussed in peer-debriefing sessions with other researchers working in the area of infant feeding practices in Bangladesh. Also, the findings of our study concur well with the patterns of infant feeding seen in the Bangladesh DHS data sets (specifically, prolonged breast-feeding, delayed introduction of regular complementary foods) as well with other studies done in Bangladesh in the recent years (2,14).

This study design does not enable us to make statistical comparisons of different groups, but it is useful to characterize patterns of childcare and to generate hypotheses related to the determinants of childcare practices and child health. Most importantly, it permits a deeper understanding of the complexities of decision-making about infant feeding and care practices.

Conclusions

Effective behaviour change messages and interventions should target different individuals in a household (particularly older women and fathers, in addition to mothers) in order to ensure that all household members are well informed about the importance of appropriate infant feeding and care practices. However, the availability of adequate resources at the household level is essential to allow the translation of knowledge into good nutritional outcomes for children. Also, programmes that intend to promote appropriate infant feeding practices should consider the importance of providing support for dealing with infant feeding problems in addition to
providing information about appropriate infant feeding practices to caregivers.

References