The Value of Intermittent Growth Monitoring in Primary Health Care Programmes

Pages with reference to book, From 129 To 132

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Abstract

The objective of growth monitoring is to detect early growth faltering before the child becomes severely malnourished. It has been found in many large projects in the private sector and in Government run Primary Health Care (PHC) pragrammes that monthly weighing is not feasible which makes it impossible to develop a functional outreach programme on a sustainable basis. This study is an attempt to propose an intermittent growth monitoring which is operationally feasible for large scale PHC pragrammes in the public sector. A historical prospective study was conducted to find out the correlation of weights of children at different ages with weights at subsequent months. Two hundred and ninety-two growth cards of children were selected from two squatter settlements of Karachi which are having a PHC programme through the Aga Khan University. At six months: about 71% of children were within the normal range: with increasing age from 10% to 39% of these children shifted to grade I Protein Energy Malnutrition (REM). When weights of children for each month were correlated with weights at all other months up to 24 months, it was found that correlation coefficient at 6th and 9th month were significant (P value < 0.001). Probability of developing malnutrition at different weights and ages were also calculated. The results indicate that malnutrition starts appearing at 6 months and weights at 6 months and to a lesser extent at 9 months are better prognostic indices of future malnutrition. Intermittent weighing of children can help in early identification of 'high risk' children who can then be managed and even be prevented from developing future malnutrition (JPMA 43:129, 1993).

Introduction

Growth monitoring is one of the several activities of a number of clinic-based as well as community-based health care programmes. Varied definitions of the term "growth monitoring' can be found. While some imply it as watching over and evaluating a child's growth pattern[1], others emphasize actions to be taken after such monitoring[2]. Hence the term 'growth promotion' and 'growth monitoring and promotion' have also been suggested. Considerable confusion about the basic objectives of growth monitoring[3], and lack of understanding can lead to faulty implementation[4]. Morley[5] defined the objective of growth monitoring as preventing growth retardation through timely and early detection of faltering of growth. Weighing is not growth monitoring and is of little value by itself[4,6]. In many projects growth monitoring is used only as a strategy to help implement the supplementary feeding programmes, more efficiently. This approach has been strongly criticized on practical, economic and even psychological grounds[4,6,7]. Screening of children by growth monitoring rçquires accuracy in several sequential steps; generally speaking, these activities are done adequately[8,9]. However, growth monitoring procedure has been help to be too complex, costly and time consuming to be effective in large scale programmes[10]. Thus, in large scale programmes and government run projects growth monitoring has been found to be "difficult", "not feasible" and 'very time consuming". The result is that it is impossible to develop a . functional outreach growth monitoring programme on a sustainable basis. Can we have an alternative approach which is both cost-effective and operationally feasible for

large scale primary health care programmes? Weight at specific months was highly correlated with weights at subsequent months, implying that weights at different months can be predicted. The objective of this paper is to provide a newer concept of “Intermittent growth monitoring” or to be more precise “re- screening” for identifying those children who are either malnourished or are highly likely to develop malnutrition in future. The specific objectives of the study were to determine the co-relation of weights of children at different ages with weights at subsequent months and also to determine the probability of developing future malnutrition by taking different weights at specific ages.

Methods

The Aga Khan University, Karachi has developed primary health care modules in seven squatter settlements of Karachi, sequentially since 1985. A team of health personnel including Community Health Workers are providing a package of preventive, promotive and curative services. Orangi and Grax are the two among such squatter settlements presently under this surveillance system[11]. Community health workers visit all the registered households of the defined population, each month. In addition to other health related activities, growth monitoring is also done by weighing (by using Salter scales with a margin of error of 100 grams) all the children under 3 years and the weight for age recorded on the growth card. About 10% of the children are randomly checked by the management information team to maintain the reliability of data. This is a historical prospective study based on the data extracted from the growth cards. Growth cards of children from these two squatter settlements were randomly selected. Each growth card had atleast 15 months of child’s weight for age recorded (NCHS standards); emphasis was given on regular and serial weight records from birth till 24 months. Failure to fulfill these criteria in any of the growth card automatically led to its non-selection. Data entry and analysis was done using dBase III Plus and SPSS/PC software programmes. Standard statistical tests especially correlation coefficient were used. Weights of children on growth cards were either copied as were written according to different ages or were interpreted by atleast two observers allowing an error margin of 100 grams only. The severity of malnutrition based on Gomez\'s classification was also transcribed from the growth cards.

Results

Data of 293 growth cards was utilized after the fulfillment of selection criteria. There were almost an equal number of male (51.5%) and female (48.5%) children in the study group. In the initial months almost 80% of children were normal, though by six months, 71% of children were within the normal range (Table).

Table. Percentage distribution of nutritional status of children 24 months and under according to Gomez's Classification.

Age in months	Nutritional Status (%)			
	Grade III PEM	Grade II PEM	Grade I PEM	Normal
1	2.8	0.9	14.4	81.9
2	6.6	1.7	13.4	78.3
3	2.4	4.1	14.8	78.6
4	1.7	4.5	17.9	75.9
5	0.7	5.2	22.1	72.0
6	1.4	6.5	21.2	70.9
7	1.4	7.2	24.3	67.1
8	1.0	5.5	32.1	61.4
9	3.4	5.5	30.0	61.0
10	2.8	6.9	37.2	53.1
11	2.4	8.6	44.0	45.0
12	2.1	9.1	41.3	47.6
13	2.1	8.7	47.6	41.7
14	1.7	7.6	50.2	40.5
15	1.4	8.4	54.4	35.8
16	1.1	9.6	51.3	38.0
17	2.0	9.9	48.2	39.9
18	1.3	7.5	53.1	38.1
19	0.9	8.5	52.7	37.9
20	0.5	8.3	52.9	38.3
21	1.0	8.0	51.3	39.7
22	0.0	7.6	51.1	41.3
23	0.6	6.5	47.3	45.6
24	0.7	5.3	50.0	44.1

When followed prospectively, with increasingage, from 10% to. 39% of these children shifted to grade I Protein-Energy Malnutrition (PEM) (Figure 1).

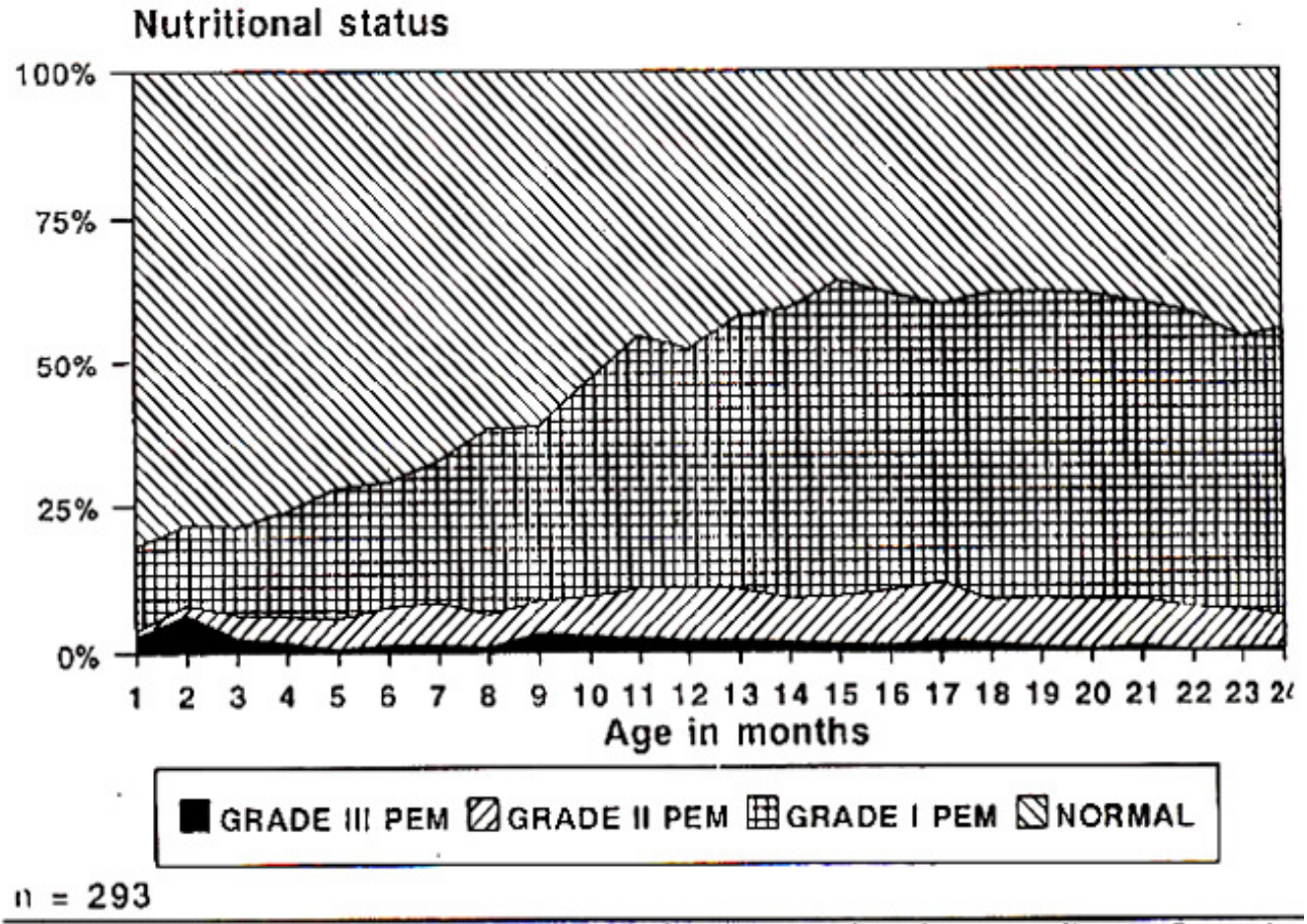

Figure 1. Nutritional status of children 24 months and under according to Gomez's classification.

The number of children in Grade III PEM, in spite of our growth monitoring programme, increased from four (at six months) to ten at nine months, decreasing to three only after eighteen months. When weights of children for each month were correlated with weights at all other months, uptil 24 months, it was found the correlation coefficient at sixth and ninth month were significant (P value c0.001)(Figure 2).

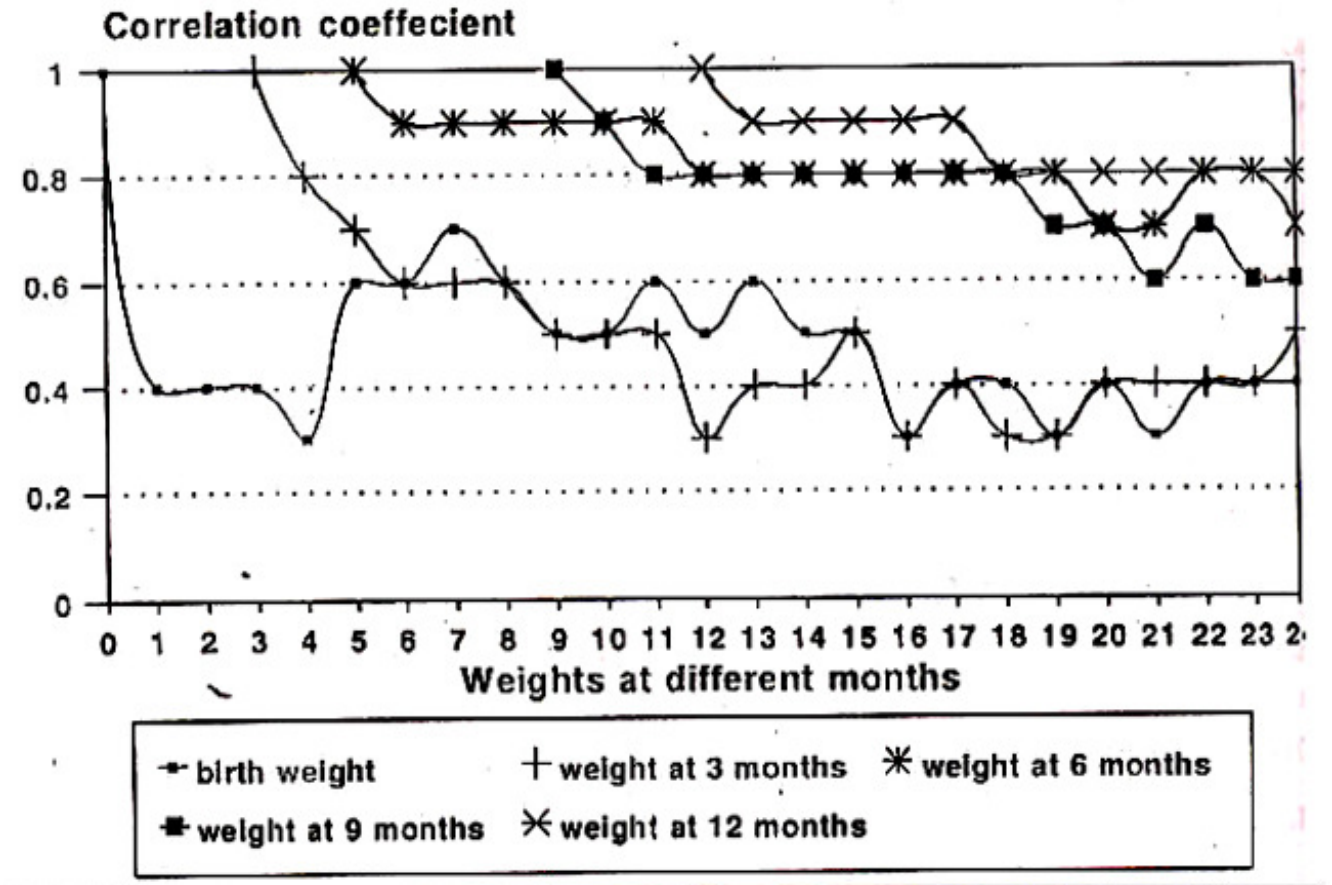

Figure 2. Correlation coefficient of weights at 0, 3, 6, 9 and 12 months with weights at individual months - till 24 months.

Probability of developing malnutrition at different weights and ages were also calculated.

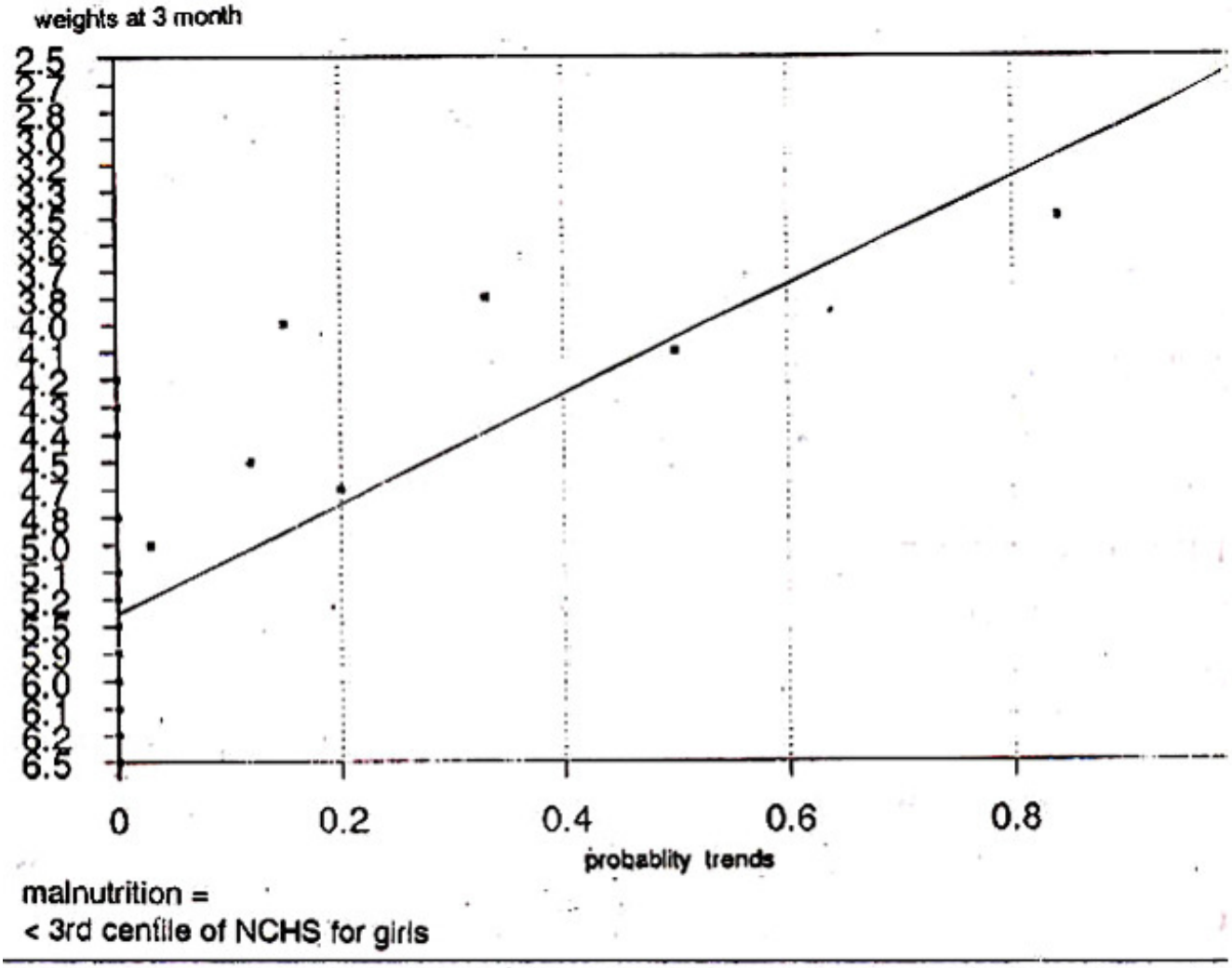

Figure 3. Weight at 3 months and future probability of developing malnutrition at 6 months of age.

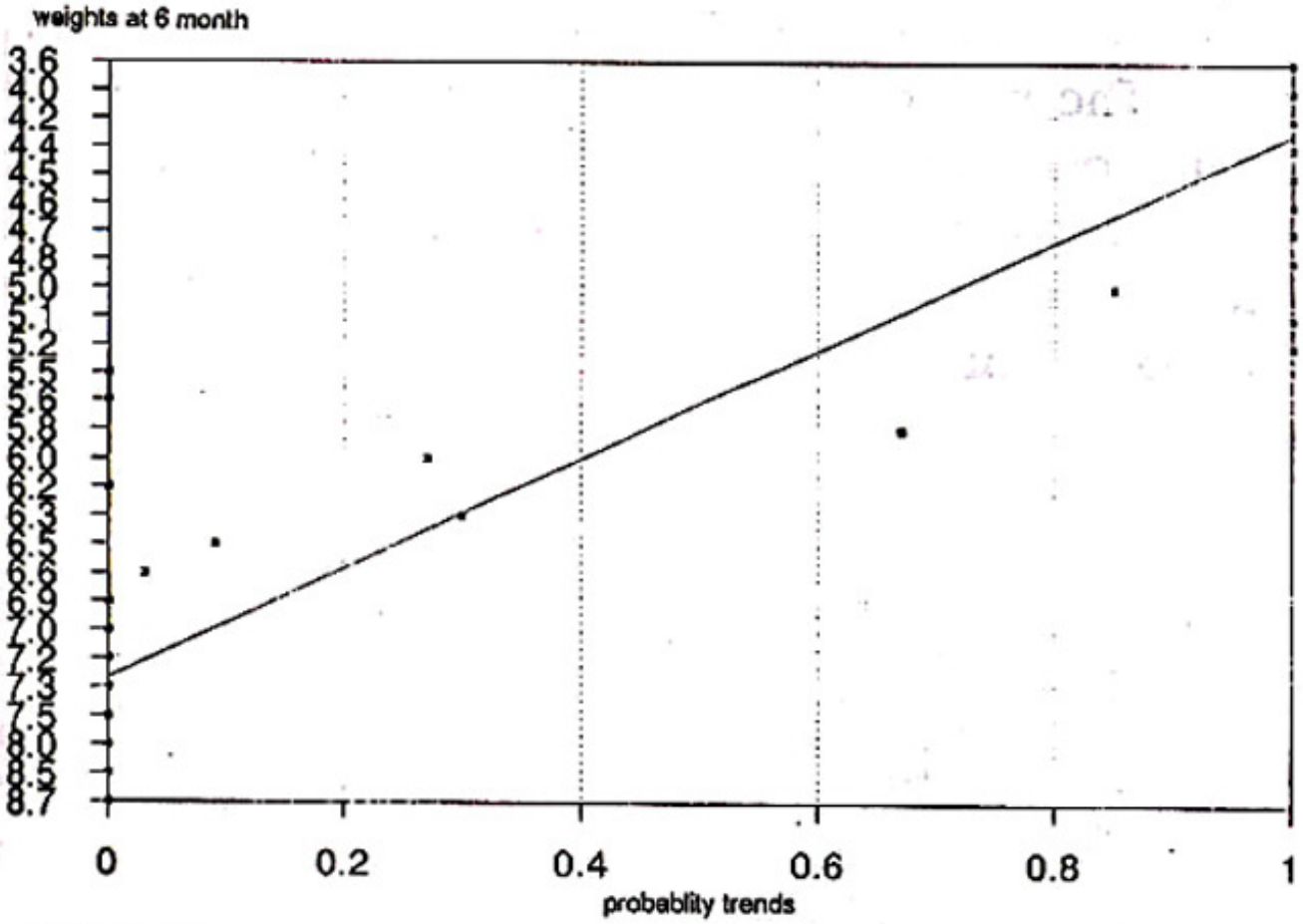

Figure 4. Weight at 6 months and future probability of developing malnutrition at 9 months of age.

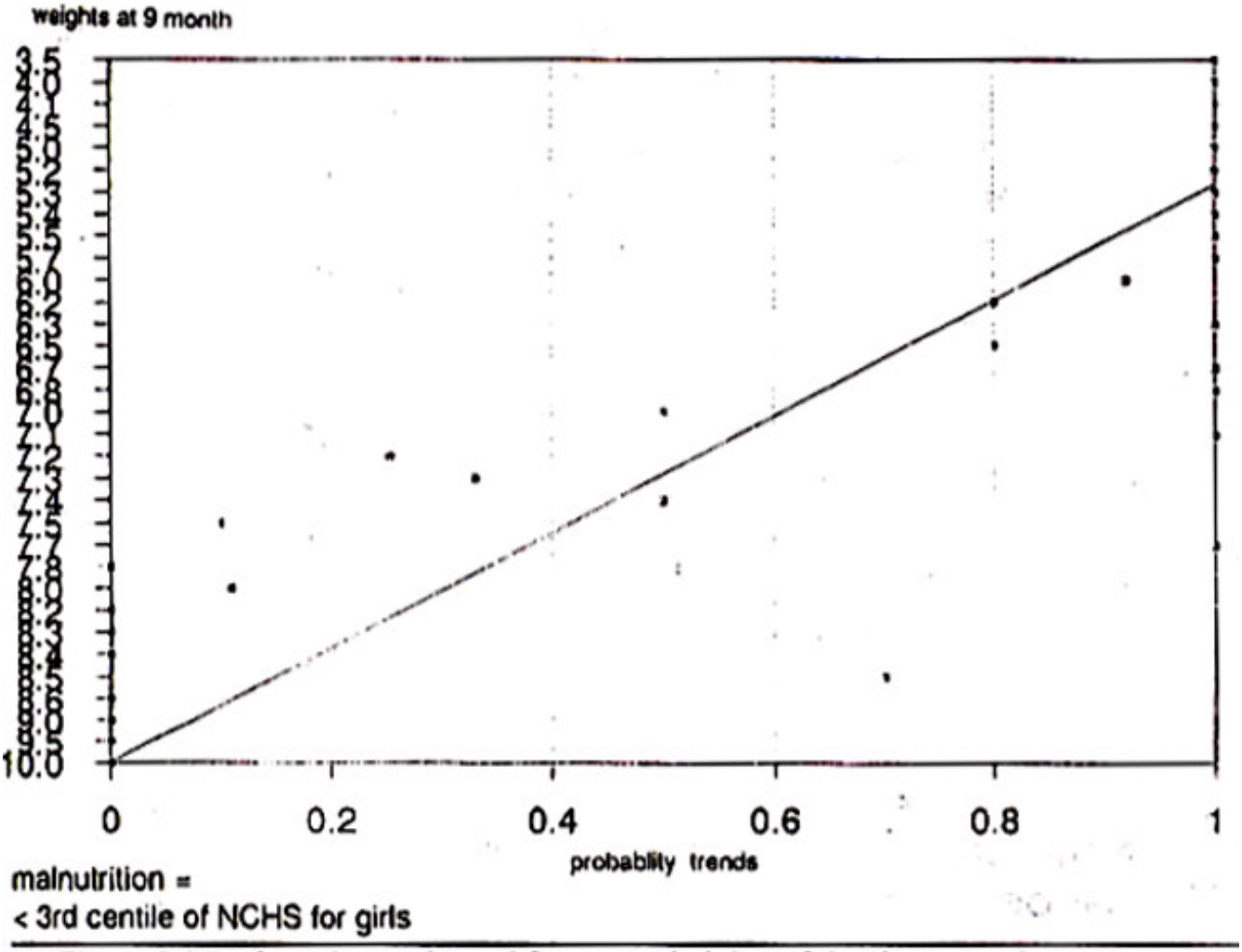

Figure 5. Weight at 9 months and future probability of developing malnutrition at 12 months of age.

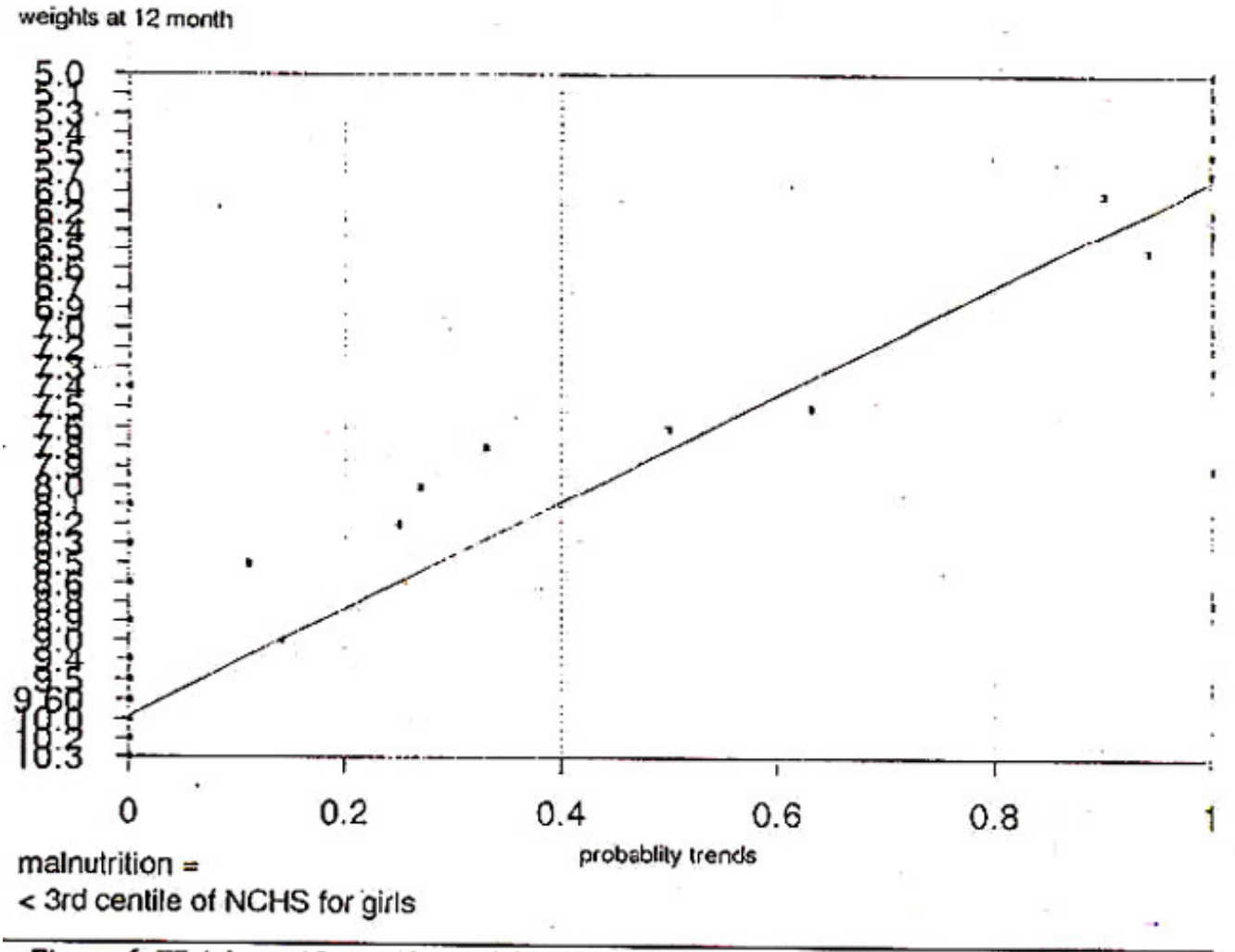

Figure 6. Weight at 12 months and future probability of developing malnutrition at 18 months of age.

Figures 3-6 show probability trends of developing malnutrition at subsequent months. Taking the weights of children at 3, 6, 12 and 18 months, having 0.8 (80%) probability of developing malnutrition and then plotting those weights on the standard growth chart, it was noted that, these weights fall just below the margin of lower standard curve (Figure 7).

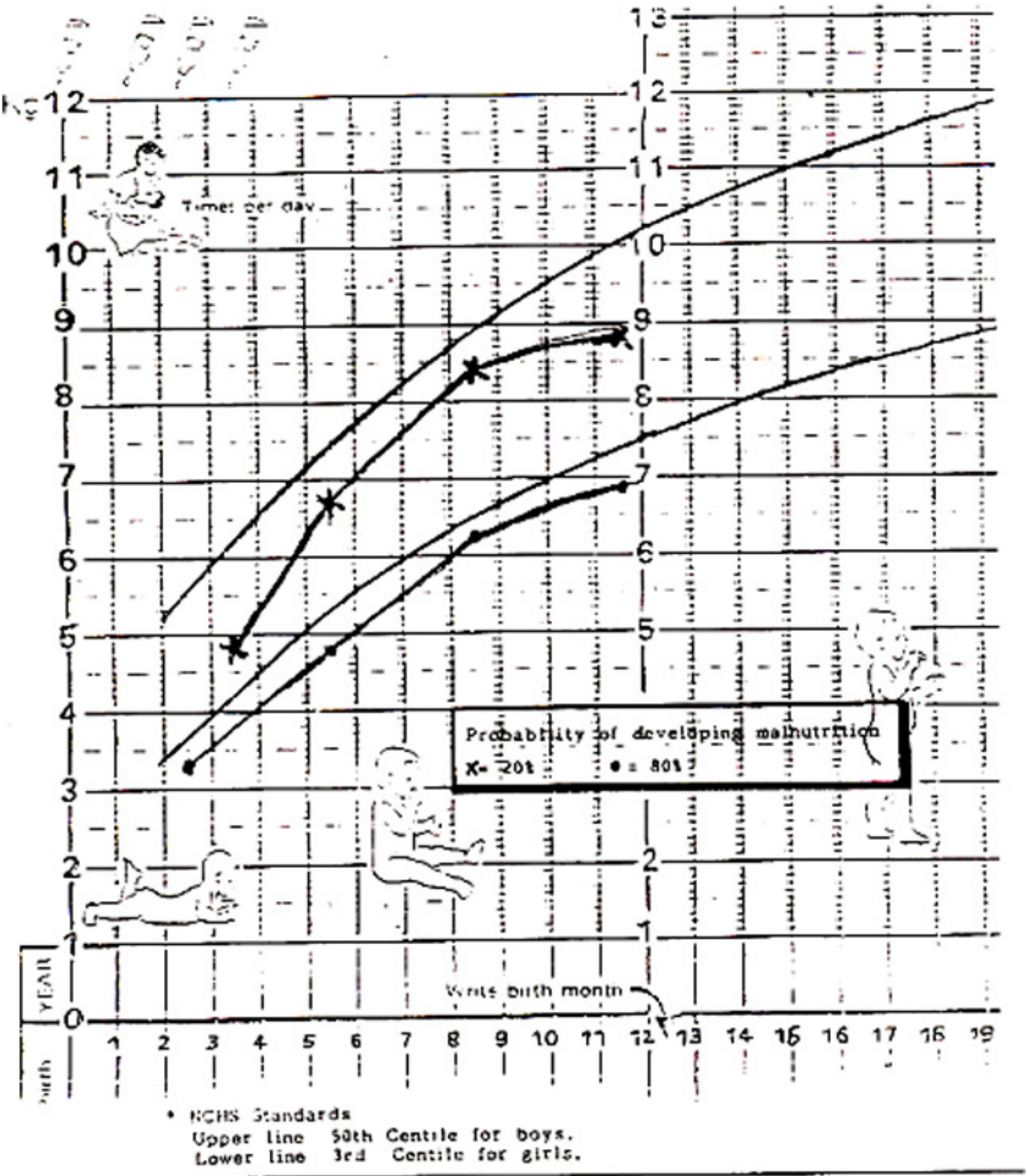

Figure 7. Probability of developing malnutrition when compared with normal standard growth curves*

This indicates that if the weight of the child is below that curve then there is 80% more chance of it remaining so. This maybe, however, attributed to the child's genetic potential. The fact that these findings start appearing only at 6 months and later on, which also coincide with the steep rise in malnutrition at 6 months (as mentioned earlier) negates this hypothesis.

Discussion

The results indicate that malnutrition starts appearing at six months with a steep rise followed by a plateau in later months. The high correlation coefficients at six months and moderate for birth and three months suggest that most children who have allow weight-for-age later in childhood can be recognized as early as three to six months of age by their weight-for-age at that time. In a primary health care setting this approach can also give an earlier and precise warning as with the regular monitoring of monthly weight changes. Thus instead of weighing regularly each month which is difficult and at places not feasible, intermittent monitoring (at specific intervals but specially at six and nine months) can serve the same purpose. The concept of early detection of malnutrition by growth monitoring assumes that children become malnourished as a result of insufficient weight gain over time during which the child's growth curve crosses over the standard growth curves towards the lowest percentiles. The same concept can be applied for intermittent growth monitoring. If the weighing of children can be combined, with immunization by EPI (Expanded Programme of Immunization) extension workers, they can be weighed at following ages while immunizing them: at birth combined with BCG, at six weeks combined with DPT1 and Polio 1, at ten weeks combined with DPT2 and Polio2 and at fourteen weeks combined with DPT3 ahdPolio3. An addition of a "special visit" at six months may be mandatory as this is the crucial point. At nine months the children can be weighed along with the measles immunization. Local people (volunteers) or even mothers can also be trained to re-screen their children by taking weights at specific intervals, plotting it on the growth card and noting whether it lies within the two normal standard curves. Another innovative approach could be the adaptation of the newer scale, "Age scale", pilot-tested in Nigeria by UNICEF, having dial markings representing the ages in months at which weights should be achieved (as of the standard curve in growth chart) and does not require any chart[12]. The "high risk" children (falling below the lower normal curve or below the expected weight) thus identified can then be managed and even be prevented from developing future malnutrition by having both, training of EPI workers and community volunteers and a good referral system to a government outlet having a nurse or a doctor and when a health personnel encounters a visit with a child. The purpose would not only be purely growth promotion (as with the ideal growth monitoring) and encouraging and promoting the growth when a child is detected to be normally nourished but also identifying "at- risk" children.

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