ACCURACY OF NELSON AND BEST GUESS FORMULAE IN ESTIMATION OF WEIGHTS IN NIGERIAN CHILDREN POPULATION

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ABSTRACT

Background: **An alternative method of estimating children's weights, when direct weighing is impracticable is the use of age-based formulae but these formulae have not been validated in Nigeria. This study compares estimated weights from two commonly used formulae against actual weights of healthy children.**

Methods: **Children aged 1 month to 11 years (n= 2754) were randomly selected in Ibadan, Nigeria using a two-stage sampling procedure. Weight of each child, measured using a standard calibrated scale and determined using Nelson and Best Guess formulae, were compared. Demographic characteristics were also obtained. Mean percentage error (MPE) was calculated and stratified by gender and age. Bland-Altman graphs were used for visual assessment of the agreement between estimated and measured weights. Clinically acceptable MPE was defined as ±5%. Descriptive statistics and paired *t* test were used to examine the data. Statistical level of significance was set at p = 0.05.**

Results: **There were 1349 males and 1405 females. Nelson and Best Guess formulae overestimated weight by 10.11% (95% CI: -20.44, 40.65) in infants. For 1-5 years group, Nelson formula marginally underestimated weight by -0.59% (95% CI: -5.16, 3.96) while it overestimated weight by 9.87% (95% CI: 24.89, 44.63) in 6-11 years. Best Guess formulae consistently overestimated weight in all age groups with the MPE ranging from 10.11 to 30.67%.**

Conclusion: **Nelson and Best Guess formulae are inaccurate for weight estimations in infants and children aged 6-11 years. Development of new formulae or modifications should be considered for use in the Nigerian children population.**

Keywords: Measured weight, Best Guess formula, Nelson formula, Mean percentage error

BACKGROUND

Determination of the weight of a child is an essential part of paediatric practice whether in the emergency unit, ward or clinic setting. The weight is an important element in making a number of diagnostic and treatment decisions including nutritional status assessment, drug doses, sizes of equipment, use of treatment normogram, fluid therapy and energy levels for defibrillation. Also, weight determination is a major component of growth monitoring and it is critical to the institution of most preventive child health interventions included in the child survival strategies.[1,2] The most accurate method of determining a child's weight is to weigh the child on a standard machine with calibrated scales. However, this may not sometimes be practicable. For instance, when resuscitating a critically ill child. In such situations, the child healthcare providers instead may ask the caregivers for the child's weight or estimate the weights based on their experience or use other means like employing age-based formulae. Asking parents for the weight of their child may seem more feasible but it is less reliable in emergency setting than trying to weigh a critically ill child.[3-5] A previous study showed that weight estimation by parents, physicians and nurses were similarly unreliable even in the United States of America where literacy rate is higher than in Africa.[5] Conversely, some authors showed that Australian and Israeli parents' estimate of a child's weight were quite accurate.[3,4]

In Nigeria, anecdotal observations showed that, healthcare providers in most clinics and hospitals use formulae for quick estimation of children's weight whenever weighing is considered time-wasting or child is too ill to be moved around for such a procedure. Sometimes a weighing scale may not even be available in rural areas and estimating the child's weight remains the only feasible option for getting the weight. Where weighing is impracticable or there is no weighing scale, the relevance of knowing a child's expected weight and the urgency with which paediatricians and other child healthcare providers estimate weight in their practice underscore the need to get it done accurately and as quickly as possible. Then, a proven alternative to use of weighing scale is the use of formulae for estimation of weights in paediatric practice.[6]

Some of the commonly used age-based formulae include: the Nelson formulae,[7,8] Advanced Paediatric Life Support (APLS) formula,[9] Best Guess formulae,[10] Argall formula [11] and Luscombe formulae.[12] Many studies have shown that the accuracy of different methods of weight estimation vary amongst different populations.[11,13-16] Many of the formulae for weight estimation were not only derived in the western paediatric populations, but thereafter they were subjected to validation[12,16-19] locally before their use in those countries. Despite the wide use of Nelson and Best Guess formulae for estimation of weight in Nigerian children, data on their validations are sparse in the African population. Only in a few African countries, namely; South Africa,[20] Malawi[21] and Kenya[22] were studies carried out to evaluate the accuracy of formulae used in children.

Accurate and reliable means of weight estimation in children is vital. For instance, inaccurate weight estimation may increase the likelihood of drug adverse events and toxicity.[23] This underscores the need to evaluate the methods by which weight estimation is performed with or without modifications to the existing formulae in Nigerian children. This study was carried out to assess the accuracy of Nelson and Best Guess formulae in use for weight estimation. The main question to be answered was "do age-based Nelson and Best Guess formulae accurately estimate the weight of Nigerian children?"

METHODS

Study design and setting: The study was cross-sectional in design. Children living in and attending immunisation centres, day-cares or schools located within the Ibadan North Local Government Area (IBNLGA), Oyo State, Nigeria were prospectively recruited. The IBNLGA is one of the five Local Government Areas that make up the Ibadan metropolis and it covers a land area of 27 square kilometres. It has 12 geo-political wards. The choice of the study area and population was convenient based on accessibility, and ease of getting healthy children to participate in the research.

Study population and Sampling method: Children aged 1 month to 11 years were the target population for this study. According to the 2006 population census, children less than 15 years constitute about 12% of the estimated population of 306,795 [24] and its projected population for 2012 was 316,612. As at the time of this study, there were 110 registered immunisation centres, and 199 registered nursery and primary schools. Children hospitalised within two weeks period prior to the study, those who had obvious signs of chronic or acute illness, and those whose age could not be confirmed were excluded from the study. A two-stage random sampling technique was employed to select study centres and study participants.

Sample size determination: The estimated minimum number of children required for the study to achieve a study power of 80% at 95% level of confidence was 1838. This estimate was based on a study by Park *et al.*[25] which compared weight obtained using the various formulae with actual weight in a population of Korean children with the estimated mean percentage error (4.97) and standard deviation (18.67) for Best Guess formula, given a 0.898 margin of error yielded the largest sample size of 1838. The estimated minimum sample size was increased to 2754 to allow for a design effect factor of "2" because of the clustering nature of study centres and at least 10% rate of refusal to participate.

Questionnaire design and pretesting: The questionnaire used for this study was designed based on relevant variables extracted from related studies [11,17,18] and the experience of senior researchers at the Institute of Child Health, College of Medicine, University of Ibadan, Ibadan, Nigeria. The questionnaire had sections on socio-demographic characteristics, medical history, physical examination findings and weight measurement. This questionnaire was pretested in a pilot study which involved 40 participants in Ibadan North-East Local Government Area (reliability Cronbach alpha of 0.97).

Data collection: This study was conducted from November 2012 to April 2013. First, information leaflets, consent forms and excerpts from the questionnaire (date of birth, age, sex, level of educational attainment and occupation of the parents as well as family size and birth order of the pupils) were sent to caregivers. Second, the questionnaires were filled and weight measurements were taken at the study centres. The ages of the children were verified from school records while the dates of birth of the infants were confirmed from their immunisation cards and/or birth certificates. The children's weights were measured according to the Center for Disease Control (CDC) procedures for weight measurement.[26] A battery powered Seca 872 digital floor scale (Seca, Inc., Columbia, MD, USA) was used for weight measurements and infant scale – Seca 354 digital, for infants and children that could not stand.

Data analysis: Data were analysed using SPSS for Windows 17.0 (SPSS Inc. IL USA) with the level of statistical significance set at $p = 0.05$. The children were classified into three age groups: infants (1–11 months), 1–5 years and 6–11 years. The estimated weights of the children were calculated by substituting ages (x) into the equations of Nelson: $(x + 9)/2$ where, x is age in month for children aged 3-11 months; $2n + 8$ where, n is age in years for children aged 1–6 years; and $7n – 5/2$ n is age in years for children aged 7–12 years. For Best Guess, estimated weights were: (age+9)/2 for those 1-11 months; (2 multiplied by age in years) plus 5 for those aged 1–5 years; and 4 multiplied by age in years for those aged 5–14 years.

To compare the weights estimated using the different formulae with measured weight, the mean percentage error [100 x (estimated weight minus measured weight)/measured weight] and the absolute error (estimated weight minus measured weight) were calculated. A Bland-Altman plot was displayed to graphically present the bias and 95% limits of agreement. The percentage differences (errors) between estimated and measured weights were plotted on the y-axis while the averages of the two were on the x-axis. The dotted lines represent the limits of agreement (LOA) showing the degree of reliability while the spread of the scattered points depict the extent of agreement. For each graph, the smaller the width of LOA the better the reliability and the closer the scattered points to the line of no difference the better the agreement. The accuracy of each weight-prediction formula was assessed and defined as having a predicted weight within ±5% of the child's actual weight.

Ethical consideration: The study protocol was reviewed and approved by the Oyo State Ministry of Health Ethical Review Committee. Written and/or verbal informed consent was obtained from the parents or caregivers, and verbal consent and accent from older participants before the measurements were taken.

RESULTS

Characteristics of study participants

There were 2754 participants, comprising 1349 (49.0%) males and 1405 (51.0%) females. The age distribution of the participants by gender was as shown in Table 1 Majority of the participants were of the Yoruba tribe (81.1%). Table 2 show the mean weights of participants by age and gender. The mean weights of the male and female participants were statistically significantly different for ages 3, 9 and 10 months and 7 years old.

Table 1: Age distribution of study participants by gender

Age (years)	Total of participants	Male		Female	
		n	%	n	%
<1	277	143	51.6	134	48.4
1	159	79	49.7	80	50.3
2	173	82	47.4	91	52.6
3	171	83	48.5	88	51.5
4	221	106	48.0	115	52.0
5	207	106	51.2	101	48.8
6	280	143	51.1	137	48.9
7	242	132	54.5	110	45.5
8	245	118	48.2	127	51.8
9	251	121	48.2	130	51.8
10	318	132	41.5	186	58.5
11	210	104	49.5	106	50.5
Total	2754	1349	49.0	1405	51.0

Table 2: Mean measured weight stratified by age and gender

Age	Children aged 1 – 11 months							Children aged 1 – 11 years						
	Male			Female			P	Male			Female			P
	n	Range	Mean ±SD	n	Range	Mean ±SD		n	Range	Mean ±SD	n	Range	Mean ±SD	
1	12	3.28 - 5.69	4.76 ± 0.69	12	3.46 – 4.99	4.52 ± 0.46	0.331	79	7.2 - 14.8	10.7 ± 1.7	80	7.1-14.8	10.5 ± 1.6	0.560
2	19	4.44 - 7.33	5.77 ± 0.73	19	2.60 – 6.90	5.28 ± 0.97	0.090	82	10.1 - 19.8	13.2 ± 1.9	91	8.8-20.8	12.9 ± 1.8	0.269
3	28	4.31 - 7.74	6.32 ± 0.83	32	4.62 – 7.96	5.81 ± 0.78	0.017	83	10.0 - 20.0	14.5 ± 1.9	88	9.9-19.3	14.3 ± 2.0	0.392
4	18	5.83 – 7.95	6.78 ± 0.62	8	5.14 – 7.03	6.24 ± 0.61	0.097	106	11.4 - 22.8	16.5 ± 2.3	115	10.2-30.5	16.6 ± 3.0	0.711
5	13	7.66 – 8.50	8.00 ± 0.44	11	5.50 – 10.95	6.90 ± 1.53	0.254	106	13.9 - 30.1	18.5 ± 2.9	101	13.2-29.1	18.1 ± 2.7	0.238
6	10	6.56 – 8.80	7.48 ± 0.70	7	6.05 – 8.36	6.95 ± 0.78	0.162	143	13.65 - 28.3	19.8 ± 2.7	137	12.4-37.2	19.2 ± 3.6	0.116
7	16	5.29 – 9.02	7.28 ± 1.20	5	5.90 – 8.19	7.10 ± 0.96	0.794	132	15.2 - 33.5	22.0 ± 3.4	110	13.9-35.7	21.0 ± 3.5	0.030
8	18	6.53 – 11.02	8.09 ± 1.54	2	7.66 – 7.85	7.76 ± 0.13	0.779	118	16.5 - 33.85	23.6 ± 3.6	127	15.6-36.3	23.0 ± 3.9	0.170
9	28	6.20 – 10.30	8.15 ± 1.13	23	5.83 – 9.20	7.50 ± 0.94	0.034	121	16.9 - 37.4	26.0 ± 4.0	130	16.4-49.3	26.7 ± 6.1	0.270
10	15	6.69 – 10.30	8.64 ± 1.11	8	5.20 – 7.70	6.98 ± 0.88	0.002	132	18.2 - 41.4	27.9 ± 4.7	186	15.9-49.7	29.0 ± 6.1	0.075
11	16	7.24 – 10.04	8.62 ± 1.02	7	7.24 – 10.10	8.29 ± 1.02	0.576	104	20.4 - 48.9	30.2 ± 5.1	106	21.0-55.8	31.2 ± 6.4	0.220

**Age is in months and years for children aged 1 – 11 months and 1 – 11 years, respectively*

Pair-wise comparisons of measured and estimated weight by age

The differences between means of measured and estimated weights of the participants in each age group are as shown in Table 3. Weights estimated using Nelson and Best Guess formulae were significantly higher than measured weights in the ages 1, 7, 9 10 and 11 months by 0.36 ± 0.59 kg, 0.80 ± 1.04 kg, 1.15 ± 1.09 kg, 1.44 ± 1.30 kg and 1.56 ± 1.0 kg respectively. Also, the pair-wise comparisons of estimated and measured weights in the age groups <1 to 11 years showed that Nelson formulae significantly under estimated weight in ages 1 to 4 years and significantly overestimated weight in age groups 6, 8 to 11 years (Table 3). However, the Best Guess formulae consistently overestimated weight in all ages (Table 3).

Performance comparisons of estimated and measured weight

Table 4 shows the mean percentage error (MPE) between the measured weight and the estimated weight using the various formulae for age groups 3–11 months, 1–5 years and 6–11 years. MPE being a measure of deviation from the measured weight, for the different methods of weight estimation, showed that Nelson and Best Guess formulae were identical for participants less than 1 year and they tended to overestimate the weight of the children by 10.11% (95% CI bias = -20.44 to 40.65, SD = 15.58). The Nelson formula for ages 1 -5 years had a MPE of -0.59% (95% CI bias = -5.16 to 3.96, SD = 2.33), displaying a slight underestimation. However, the Best Guess formula overestimated the weight of the 1-5 years with 10.16% (95% CI bias = -18.69 to 39.03, SD = 14.73). For the children 6 – 11 years, the Nelson formula overestimated the weight by 9.87% (95% CI bias = -24.89 to 44.63, SD = 17.73) while the Best Guess formula again showed gross overestimation of the weight of this age group by 30.67% (95% CI bias = -3.47 to 64.81, SD = 17.42).

Agreements between measured and estimated weights

Bland-Altman graphs for assessing the agreement of weights obtained using the formulae with measured weights were as displayed in Figures 1 to 5. In Figure 1, majority of the scattered points appear to be above the line of no difference but the spread is fairly uniform as the average of estimated (from Nelson and Best Guess formulae) and measured weights increases among children aged 3–11 months. Among children aged 1–5 years (Figure 2), a substantial number of the scattered points are outside the LOA. However, there appears to be some uniformity in the spread of scattered points as the average of the estimated and

Table 3: Pair-wise comparison of measured with estimated weights using Nelson and Best Guess formulae

Age*	Children aged 1 – 11 months				Children aged 1 – 11 years						
	MW (kg)	EW	Diff ±SD**	p	MW (kg)	EWN (kg)	Diff ±SD	p	EWB (kg)	Diff ±SD	p
1	5.36	5.00	0.36 ± 0.59	0.007	10.67	10.0	-0.67 ±1.70	<0.001	12.0	1.33 ±1.70	<0.001
2	5.53	5.50	-0.03 ± 0.88	0.862	13.07	12.0	-1.07± 1.93	<0.001	14.0	0.93 ±1.93	<0.001
3	6.05	6.00	-0.05 ± 0.84	0.663	14.36	14.0	-0.36 ±1.95	0.017	16.0	1.64 ±1.95	<0.001
4	6.51	6.50	-0.01 ± 0.66	0.942	16.58	16.0	-0.58 ±2.65	0.001	18.0	1.42 ±2.65	<0.001
5	7.14	7.00	-0.14 ± 1.43	0.729	18.34	18.0	-0.34 ±2.85	0.086	20.0	1.66 ±2.85	<0.001
6	7.26	7.50	0.24 ± 0.76	0.211	19.46	20.0	0.54 ± 3.13	0.005	24.0	4.54 ±3.13	<0.001
7	7.20	8.00	0.80 ± 1.04	0.029	21.66	22.0	0.34 ± 3.48	0.124	28.0	6.34 ±3.48	<0.001
8	8.02	8.50	0.48 ± 1.37	0.296	23.26	25.5	2.24 ± 3.76	<0.001	32.0	8.74 ±3.76	<0.001
9	7.86	9.00	1.15 ± 1.09	<0.001	26.46	29.0	2.54 ± 5.18	<0.001	36.0	9.54 ±5.18	<0.001
10	8.06	9.50	1.44 ± 1.30	<0.001	28.58	32.5	3.92 ± 5.63	<0.001	40.0	11.2 ±5.63	<0.001
11	8.44	10.00	1.56 ± 1.00	<0.001	30.67	36.0	5.33 ± 5.77	<0.001	44.0	3.33 ±5.77	<0.001

**Age is in months and years for children aged 1–11 months for Best Guess, 3–11 months for Nelson and 1–11 years for both respectively*
Note: Nelson formula was not used for children aged 1-2 months
MW: Measured weight
EW: Estimated weight for both Nelson and Best Guess formulae
EWN: Estimated weight for Nelson formulae
EWB: Estimated weight for Best Guess formulae
Diff: Difference of means SD: Standard Deviation

measured weights increased. Figure 3 shows the Bland Altman graph for weights obtained using Best Guess formula in children aged 1–5 years. While the spread of the scattered points around the line of no difference in Figure 4 appears similar to those of plot obtained from Nelson formulae, there are more scattered points above the line of no difference suggesting greater tendency of Best Guess formula to overestimate weight in this age group.

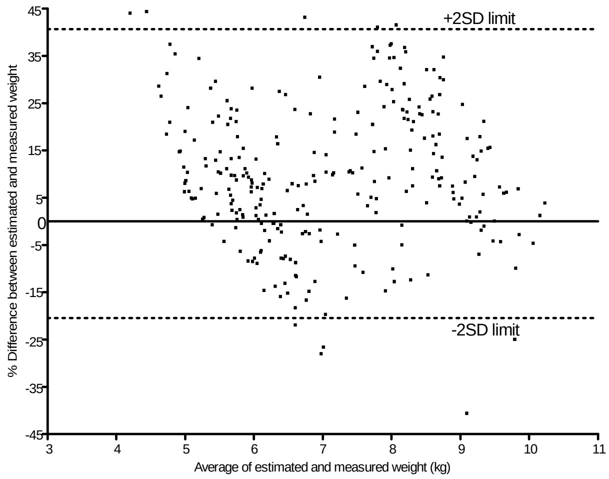

Figure 1: Bland-Altman plot of % difference and average of estimated and measured weight using Nelson and Best Guess formula for children aged 3 – 11 months

Table 4: Mean percentage error and accuracy for estimated weights

	Age (years)		
	<1*	1 – 5	6 – 11
Nelson			
• Mean % error (Bias)	10.11	-0.59	9.87
• SD of bias	15.58	2.33	17.73
• 95% CI of bias	-20.44, 40.65	-5.16, 3.96	-24.89, 44.63
Best Guess			
• Mean % error (Bias)	10.11	10.16	30.67
• SD of bias	15.58	14.73	17.42
• 95% CI of bias	-20.44, 40.65	-18.69, 39.03	-3.47, 64.81

**3 – 11 months for Nelson formula, Note: Nelson formula was not used for children aged 1-2 months*
Positive values suggest overestimation

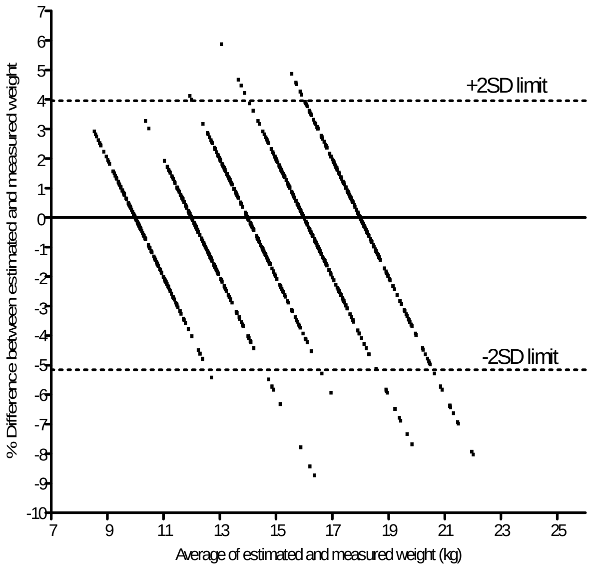

Figure 2: Bland-Altman plot of % difference and average of estimated and measured weight using Nelson formula for children aged 1 – 5 years

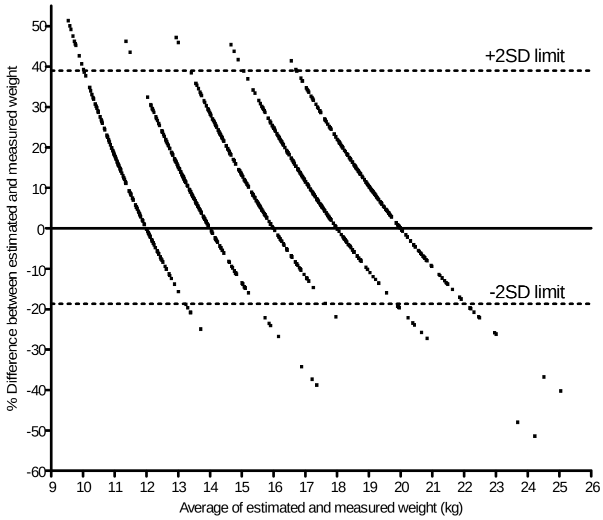

Figure 3: Bland-Altman plot of % difference and average of estimated and measured weight using Best Guess formula for children aged 1 – 5 years

In the age group 6–11 years, all the three Bland-Altman graphs (Figures 4 and 5) display similar pattern of scattered points but vary slightly in the widths of the LOA. As shown in Figure 4, the Bland-Altman graphs for Nelson formula for estimating weights in children aged 6–11 show considerable number of scattered points above the line of no difference indicating the

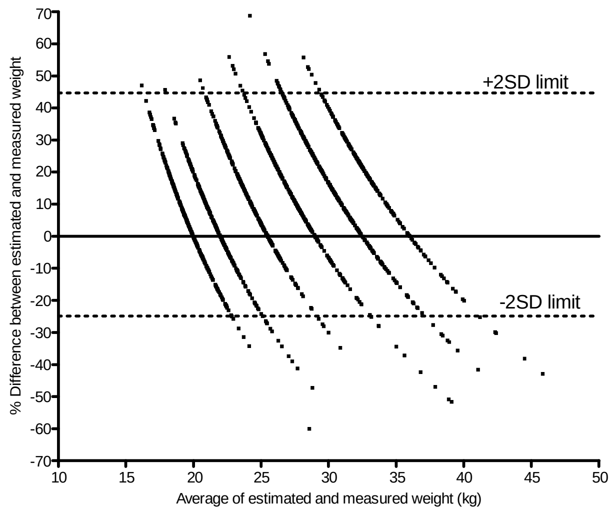

Figure 4: Bland-Altman plot of % difference and average of estimated and measured weight using Nelson formula for children aged 6 – 11 years

tendency to overestimate weights. Again, Best Guess formula (Figure 5) showed greater tendency to overestimate weight in age group 6 – 11 as the majority of the scattered points were above the line of no difference and a considerable number of points falling below the LOA.

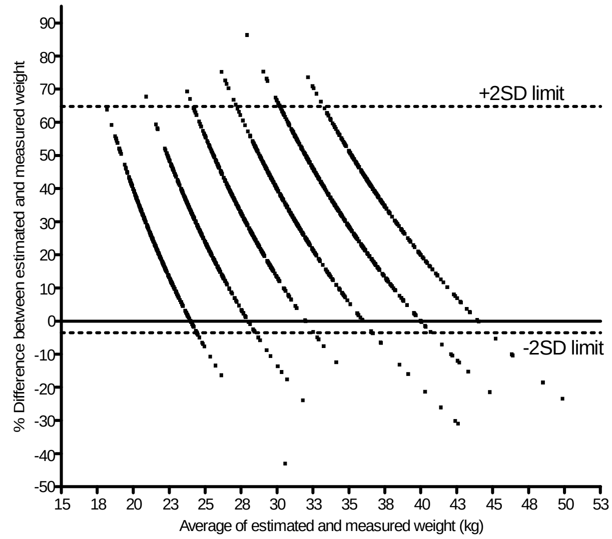

Figure 5: Bland-Altman plot of % difference and average of estimated and measured weight using Best Guess formula for children aged 6 – 11 years

DISCUSSION

This study has shown that the two common formulae currently in use for weight estimation of children in Nigeria are not consistently accurate among children. The estimated weights obtained using the formulae were at variance to the measured weight in the different age groups. The estimated weights from the Nelson formulae were considerably higher than the measured weight of infants (3-11 months) and children aged 6 to 11 years. In these age groups, the Nelson formulae overestimated the weights with a mean percentage error of over 5%, the clinically acceptable limit set for this study. The Bland-Altman graphs, which compared the percentage difference with the average of the estimated weights and measured weights, corroborated the consistent overestimation of weight by the Nelson and Best Guess formulae.

Considering the fact that the Nelson Textbook of Paediatrics [7] was published in the United States of America, it is likely that these formulae were derived from the population of American children. This may explain the degree of biases found in this study. A recent Kenyan study by House and colleagues [27] also reported that estimated weights obtained using Nelson formulae were higher than the measured weights of the Kenyan children. The current study divided the participants into three age groups (1–11 months, 1–5 years and 6 – 11 years) and obtained mean percentage errors for the participants in each group. Unlike the current study, House et al [27] did not divide the participants but rather reported a single mean percentage error of 10.4% that represented the mean of the entire study population (aged 2 days to 14 years). Nevertheless the mean percentage error from Kenya was similar to those obtained in this study amongst the infants and 6 to 11 year groups (10.1% for infants and 9.8% for ages 6 to 11 years). A different study in India [15] also demonstrated that the Nelson formulae yielded values that were higher than the measured weight of Indian infants and children aged 1 to 12 years respectively. These values agree with the findings in the present study that the Nelson formulae overestimated the weights of children. On the contrary, for children in the age group 1 to 5 years, the Nelson formula was accurate in estimation of weights of the participants when compared to the measured weight. The mean percentage error using the Nelson formula for this age group was within 5% of the measured weight which was deemed acceptable. The Bland-Altman graph also corroborated this finding though there was a very slight tendency to underestimate the weight of the participants in this age group but it was within acceptable limits.

Another important finding from the present study is that the Best Guess formula consistently yielded estimated weights that were much higher than the measured weights of Nigerian children in all age groups. The mean percentage error for the different age groups ranged from 10.11% to as high as 30.67%. This is about 6 times higher than the clinically acceptable range predetermined for this study. The gross overestimation was further demonstrated in the Bland-Altman graph for all ages and more obvious in the groups 1 to 5 years and 6 to 11 years. A possible cause of this lies in the reason the Best Guess formulae were developed in the first place.[10] These formulae were developed in Australia [10] following the observation that the average weight of Australian children had increased over a two decade period. It stands to reason that the average weight of the Australian children would be higher than that of children in many developing countries including Nigeria where undernutrition is more prevalent[28]. A few other studies have evaluated the Best Guess formulae. A validation study was carried out to evaluate its accuracy by Thompson *et al.* in 2007.[19] The validation study was retrospective in design, carried out in the hospital settings in Australia. Conversely, Kelly *et al.*[29] in a study at the Paediatric Emergency Department in Australia showed that the formulae had a tendency to overestimate the weight of children with lower body mass index and it estimated weight only moderately well [30]. It is difficult to compare the results of the study by Thompson *et al.*[19] with the findings from the present study because their study included children up to 14 years of age. Similar to the current study, Kelly *et al.*[29] also reported overestimation with the Best Guess formulae among Australian children. Moreover, a South African study also reported that Best Guess formulae generally overestimated the weight of the children.[31]

One of the strengths of the present study is the large sample of children, unlike many of the studies from other developing countries such as India,[15] Kenya[27] and Malawi.[21] Also, the fact that all social classes and children age 1 month to 11 years were fairly well represented in the study population, gives some credibility to the data compared to data from which those formulae were derived. In this study, the fact that two individuals independently measured the weights and ages were verified from school records as well as immunisation cards added values to the credibility of the data. Other reasons why the data reported in this study could be considered reliable were the use of self-calibrating digital scales which were devoid of reading errors and compliance to the WHO standard operating procedures for weight measurements.

Although, this study has evaluated formulae for weight estimation among Nigerian children for the first time, a few factors may limit the generalisability of the findings. First, those children who were not attending immunisation centres and those out of school were not included in the data. The similarities or otherwise of the children who did not participate in the study remain unknown. Second, the methods used in confirming the ages of the study participants could not have been impeccable because birth certificates (the best evidence for age) were not examined in all study subjects. Third, data on the gestational age and birth-weight of the infants were not collected during the course of this study. This may have introduced some undeterminable level of bias if a large number of the infants recruited were preterm or low birth weight babies. Such bias, if present at all, would have been more pronounced during the first 6 months of life. Fourth, the participants in this study were recruited within the metropolitan area of Ibadan. This may limit the extent to which the findings can be generalised to the children in the rural areas and other parts of Nigeria.

CONCLUSION

Data from this study have not justified the continued use of Nelson and Best Guess formulae for weight estimation of children in Nigeria. There is no doubt about the fact that measured weight of a child is considered the gold standard but it is often impractical to weigh the child in many situations. However, paediatricians need to have reliable and accurate methods of estimating weight in such situations. Going by the findings from this study there is the need to generate new formula or adjust Nelson and Best Guess formulae to reflect the differences and correct the biases associated with their use in weight estimation of Nigerian children.

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