Nurses' Perspectives on Parental Education and Anthropometric Diagnosis in the Management of Malnutrition among Preschool Children in Northwest Nigeria

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Abstract

Background: Malnutrition remains a leading contributor to illness and death among preschool children in Northwest Nigeria, the geopolitical zone with the highest burden of stunting in the country. Nurses are central to identifying and managing affected children, yet little is known about how they interpret the role of caregivers' education or how closely their diagnostic reasoning follows international criteria.

Objective: To assess nurses' perspectives on the influence of parental education on the management of malnutrition, their endorsement of diagnostic and anthropometric criteria, and the relationship between the two domains.

Methods: A cross-sectional survey was conducted among registered nurses in nine state-owned general hospitals selected by multistage sampling across three Northwest states. A validated 4-point Likert questionnaire (Cronbach's $\alpha = .974$) was administered to 370 nurses; 352 usable responses (95.1%) were analysed. Item means were judged against a criterion of 2.50, composite scores were tested against the criterion with one-sample *t* tests, and the association between domains was examined with Pearson's correlation.

Results: The parental education composite fell below the criterion ($M = 2.32$, $SD = 0.88$; $t(351) = -3.74$, $p < .001$). Nurses endorsed links between low parental education and higher malnutrition prevalence ($M = 3.30$), poor recognition of danger signs ($M = 3.33$), weaker decision-making ($M = 2.92$), immunisation use ($M = 3.26$) and colostrum refusal ($M = 3.00$), but rejected links with cultural beliefs, superstition, refusal of hospital care, early weaning, non-exclusive breastfeeding and purchasing power. The diagnosis and measurement composite exceeded the criterion ($M = 2.74$, $SD = 0.88$; $t(351) = 5.10$, $p < .001$). Mid-upper arm circumference, bilateral oedema and body mass index were strongly endorsed, whereas weight-for-height below −3 *SD* was not ($M = 2.27$). The two domains were strongly correlated ($r = .955$, $p < .001$).

Conclusion: Nurses view parental education mainly through a knowledge and service-use pathway and broadly accept anthropometric diagnosis, but gaps around weight-for-height and

age-appropriate indices point to a need for targeted in-service training alongside caregiver-focused nutrition education.

Keywords: malnutrition; preschool children; parental education; anthropometry; mid-upper arm circumference; nursing management; Nigeria.

Introduction

In low and middle income countries, child undernutrition is one of the most important public health issues. Undernutrition, such as fetal growth restriction, stunting, wasting and micronutrient deficiencies, is estimated to be responsible for almost half of all deaths in children under 5 years of age (Black et al., 2013). While stunting has decreased in many areas over the last 20 years, progress has been inconsistent, and sub-Saharan Africa now bears a disproportionately high burden (Victora et al., 2021). According to the latest joint estimates, there were approximately 148 million stunted and 45 million wasted children under 5 years of age in 2022, and the number of stunted children has been increasing in Africa (United Nations Children's Fund [UNICEF] et al., 2023).

Nigeria makes a significant contribution to this burden. According to the 2018 Nigeria Demographic and Health Survey (NDHS), 37% of children under five were stunted, 7% wasted and 22% underweight, with the Northwest zone having the highest prevalence of stunting in the country at 57% (National Population Commission [NPC] & ICF, 2019). The northern zones, and especially the Northwest, have been consistently found at high risk of stunting, wasting and underweight using multilevel analyses of national survey data, after adjusting for household and community characteristics (Adekanmbi et al., 2013; Akombi, Agho, Hall, et al., 2017; Akombi, Agho, Merom, et al., 2017). Maternal education, household wealth, birth interval and access to health services are also consistently associated with poor child nutritional status in these analyses.

Among the most researched factors influencing child nutrition is parental, particularly maternal education. Evidence from cross-national analyses indicates that both maternal and paternal schooling has an independent effect on reducing the risk of stunting and underweight (Vollmer et al., 2017), and that the contribution of female education to the decline in child undernutrition between 1970 and 2012 was significant (Smith & Haddad, 2015). How this happens, however, is still a matter of debate. Education can work via nutrition knowledge, health-care seeking, decision-making autonomy, household income or fertility behaviour (Alderman & Headey, 2017; Frost et al., 2005). There is some evidence that schooling below a certain level provides little protection (Makoka&Masibo, 2015), and that nutrition-specific

knowledge can be important, regardless of years of schooling (Burchi, 2010; Fadare et al., 2019). Education of mothers in urban informal settlements has been related to the nutritional status of children primarily through its connection with household resources and child-care practices (Abuya et al., 2012).

A UNICEF conceptual framework of the determinants of maternal and child nutrition provides a helpful lens for identifying maternal and child education within this causal chain (UNICEF 2020). In that context, the nutrition of children and their feeding and care practices are directly affected by the underlying determinants of nutrition, which in turn are influenced by enabling determinants, such as resources and social norms and governance. Parental education is at the enabling level, and can impact all levels above, including the ability to afford healthy foods in the household and the time taken to take a sick child to a health facility. The framework thus suggests that for some types of child nutrition, education can be more important than for others, if the binding constraint in a particular context is knowledge, resources or social norms.

Understanding these pathways is important for practice and the way they are understood by health workers. Nurses, typically the first to encounter malnourished children in Nigerian general hospitals, are the ones who provide counselling and triage children, and the nature of their counselling and how they triage children reflect their beliefs about the causes of malnutrition and what caregivers can practically do. A nurse who sees the main cause of malnutrition as being poverty might focus on referring to food support services while a nurse who sees the issue as a lack of knowledge might focus on educating people on feeding. Yet, research on nurses' views in West Africa has been primarily on knowledge of treatment guidelines and not on their understanding of social determinants (Mogre et al., 2017).

The second pillar of effective management is accurate diagnosis. Severe acute malnutrition in children 6-59 months is defined by a weight-for-height z score below −3, a MUAC below 115 mm or bilateral pitting oedema (WHO, 2013; WHO & UNICEF, 2009). These criteria are based on WHO Child Growth Standards (WHO Multicentre Growth Reference Study Group, 2006). Both MUAC and WHt are recommended as standalone admission criteria and identify overlapping but different groups of children (Briend et al., 2012; Grellety& Golden, 2016; Laillou et al., 2014). The community based management of acute malnutrition (CMAM) programme in Nigeria has heavily used MUAC for case detection, admission and discharge (Chitekwe et al., 2018) and this may influence the diagnostic practice of community and hospital nurses. Misconceptions about diagnostic indices, including the use

of adult BMI cut-off for young children, can result in missed or incorrect diagnosis and direct impact on treatment (Bhutta et al., 2017).

Against this background, little empirical work has examined, within a single sample of hospital nurses in Northwest Nigeria, how parental education is perceived to shape the management of malnutrition and how closely nurses' diagnostic judgements align with WHO criteria. This study therefore addressed three questions: (a) To what extent do nurses perceive parental education as influencing the management of malnutrition among preschool children? (b) Which diagnostic and anthropometric criteria do nurses endorse for identifying malnutrition? (c) What is the relationship between nurses' perspectives on parental education and on diagnosis and measurement?

Methods

Study Design and Setting

A descriptive cross-sectional survey was conducted and is reported in line with the STROBE guidelines for observational studies (von Elm et al., 2007). The study took place in the Northwest geopolitical zone of Nigeria, which comprises Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara States. The zone is predominantly Hausa and Fulani, has the largest population of Nigeria's six zones and records the country's highest prevalence of child stunting (NPC & ICF, 2019). State-owned general hospitals in the zone provide secondary-level paediatric care, including inpatient stabilisation of children with complicated malnutrition. Data were collected in 2022. This article reports the parental education and diagnostic components of a larger thesis project; nurses' perceptions of health-system and household factors contributing to poor treatment outcomes are reported separately.

Population and Eligibility

The study population comprised 8,988 nurses employed in state-owned general hospitals across the zone. Registered nurses aged 20 years or older who were working in the selected hospitals and who had participated in the care of hospitalised children with malnutrition were eligible. Nurses with no experience of managing malnutrition were excluded.

Sample Size and Sampling

The sample size was determined from the Research Advisors table, which is derived from the Krejcie and Morgan (1970) formula; for a population of 8,988 at a 95% confidence level and 5% margin of error, it recommends 370 respondents. A five-stage sampling procedure was

used. First, three states were selected by simple random sampling (balloting). Second, the three senatorial districts in each selected state were treated as strata. Third, one general hospital was randomly selected from each senatorial district, giving nine hospitals. Fourth, the number of nurses to be sampled in each hospital was allocated in proportion to its nursing staff strength. Finally, respondents were selected systematically from staff registers using a sampling interval of five with a random start.

Instrument

Data were collected with a structured, researcher-developed questionnaire. Section A captured four sociodemographic characteristics: gender, age, years of nursing practice and highest professional qualification. Section B contained the study scales. The parental education scale comprised 13 statements on how caregivers' educational level influences the occurrence and management of malnutrition, covering awareness, decision-making, income, care seeking, cultural practices and infant feeding. The diagnosis and measurement scale comprised nine statements on clinical and anthropometric criteria used to diagnose malnutrition, including MUAC thresholds, bilateral oedema, weight-for-height, weight-for-age, body mass index, fever, hypoglycaemia and serum albumin. Responses were scored on a 4-point scale (strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1).

Face and content validity were established by four experts drawn from nursing science, medicine and health education, together with the project supervisor, whose corrections were incorporated into the final version. Internal consistency for the full instrument was excellent (Cronbach's $\alpha = .974$). Because very high alpha values can indicate item redundancy as well as reliability, this coefficient is interpreted with caution (Taber, 2018).

Data Collection

Trained research assistants administered the questionnaires in each hospital after the researcher had briefed them on the study purpose, the content of the instrument and the procedures for obtaining consent. Completed questionnaires were collected on site. Of 370 questionnaires distributed, 358 (96.8%) were returned and six were excluded because of incorrect completion, leaving 352 (95.1%) for analysis.

Ethical Considerations

Ethical approval was obtained from the ethics committees of the state Ministries of Health and Hospitals Management Boards responsible for the participating hospitals. Permission was also obtained from the management of each hospital. Participation was voluntary, written

informed consent was obtained from every respondent, and participants were told they could withdraw at any time without penalty. No personal identifiers were recorded. The study was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013).

Data Analysis

Data were analysed with IBM SPSS Statistics version 23. Sociodemographic characteristics were summarised with frequencies and percentages. Item responses were summarised with means and standard deviations. Following the scoring convention for 4-point scales, an item mean of 2.50 or above was taken to indicate agreement (accepted) and a mean below 2.50 to indicate disagreement (rejected). Composite scores for each scale were computed as the mean of item scores and compared with the criterion value of 2.50 using one-sample *t* tests; 95% confidence intervals were reported. The association between the parental education and diagnosis composites was assessed with Pearson's product-moment correlation, with Spearman's rank correlation as a sensitivity check. Statistical significance was set at $p < .05$.

Results

Characteristics of Respondents

Of the 352 nurses, 216 (61.4%) were women. Most respondents were aged 41–50 years (63.6%), and more than half had practised for 21–30 years (55.1%). A diploma in nursing was the most common highest qualification (48.9%), followed by a bachelor's degree (29.0%) (Table 1).

Table 1: Sociodemographic Characteristics of Respondents (N = 352)

Characteristic	Category	N	%
Gender	Female	216	61.4
	Male	136	38.6
Age (years)	20–30	32	9.1
	31–40	77	21.9
	41–50	224	63.6
	51 and above	19	5.4
Years of practice	1–5	14	4.0
	6–10	25	7.1
	11–15	3	0.9
	16–20	94	26.7
	21–30	194	55.1

Characteristic	Category	N	%
	31–35	22	6.3
Highest qualification	Postgraduate degree	33	9.4
	Bachelor's degree	102	29.0
	Diploma	172	48.9
	Certificate	37	10.5
	Other	8	2.3

Note. Percentages may not sum to 100 because of rounding.

Perceived Influence of Parental Education

Nurses agreed with five of the 13 statements on parental education (Table 2). The strongest agreement concerned the view that low parental education limits awareness of the danger signs of malnutrition (M = 3.33, SD = 0.89) and that malnutrition is more common among children of parents with little education (M = 3.30, SD = 0.96). Nurses also agreed that parental education shapes the use of immunisation services (M = 3.26), the refusal of colostrum for newborns (M = 3.00) and parents' decision-making about managing malnutrition (M = 2.92). In contrast, nurses rejected statements linking parental education to income for buying nutritious food (M = 2.11), use of unqualified practitioners (M = 2.06), harmful cultural beliefs (M = 1.90), superstition (M = 1.79), refusal to take children to hospital (M = 1.88), early weaning (M = 1.89), refusal of exclusive breastfeeding (M = 1.99) and inadequate purchasing power (M = 1.76).

Table 2: Nurses' Perspectives on the Influence of Parental Education on the Management of Malnutrition (N = 352)

Statement: Parental education level influences…	M	SD	Decision
Prevalence (malnutrition higher where parental education is low)	3.30	0.96	Accepted
Awareness of the danger signs of malnutrition	3.33	0.89	Accepted
Parents' decision-making on managing malnutrition	2.92	0.94	Accepted
Income available to buy nutritious food	2.11	0.86	Rejected
Patronage of unqualified practitioners and their products	2.06	0.83	Rejected
Adherence to harmful cultural beliefs that delay hospital care	1.90	1.13	Rejected
Superstition about the malnourished child	1.79	1.07	Rejected
Use of immunisation services	3.26	1.05	Accepted
Refusal of colostrum for the newborn	3.00	0.85	Accepted
Refusal to take the child to hospital for treatment	1.88	1.14	Rejected
Early weaning of the child	1.89	1.04	Rejected
Refusal of exclusive breastfeeding	1.99	0.85	Rejected
Inadequate purchasing power to manage the child	1.76	1.07	Rejected

Note. Responses scored 1 (strongly disagree) to 4 (strongly agree). Accepted = item mean ≥ 2.50; rejected = item mean < 2.50.

Endorsement of Diagnostic and Anthropometric Criteria

Nurses accepted six of the nine diagnostic statements (Table 3). Agreement was highest for a low body mass index below 18.4 (M = 3.33), bilateral oedema (M = 3.22) and a MUAC below 110 mm (M = 3.15). Low weight-for-age and low serum albumin were each endorsed (M = 2.93), as was a MUAC of 125–134 mm as an indicator of risk (M = 2.86). Severe wasting defined by a weight-for-height below −3 *SD* was not endorsed (M = 2.27). Nurses also rejected high fever due to infection (M = 1.93) and hypoglycaemia (M = 2.03) as diagnostic criteria.

Table 3: Nurses' Endorsement of Diagnostic and Anthropometric Criteria for Malnutrition (N = 352)

Statement: Malnutrition is diagnosed when the child has…	M	SD	Decision
MUAC < 110 mm (red; severe malnutrition)	3.15	1.08	Accepted
MUAC 125–134 mm (yellow; at risk)	2.86	0.91	Accepted
Bilateral oedema	3.22	0.83	Accepted
Weight-for-height below −3 SD (severe wasting)	2.27	0.96	Rejected
Low weight-for-age (described as stunting)	2.93	0.98	Accepted
Body mass index below 18.4	3.33	1.00	Accepted
Very high temperature from underlying infection	1.93	1.14	Rejected
Very low blood glucose (hypoglycaemia)	2.03	0.84	Rejected
Very low serum protein (albumin)	2.93	0.94	Accepted

Note. Statements are reproduced as worded in the questionnaire. MUAC = mid-upper arm circumference; SD = standard deviation. Accepted = item mean ≥ 2.50.

Composite Scores and Relationship between Domains

The parental education composite was significantly below the criterion value, M = 2.32, SD = 0.88, 95% CI [2.23, 2.42], $t(351) = -3.74$, $p < .001$, indicating that on balance nurses did not regard parental education as a dominant influence across all aspects of management. The diagnosis and measurement composite was significantly above the criterion, M = 2.74, SD = 0.88, 95% CI [2.65, 2.83], $t(351) = 5.10$, $p < .001$. The two composites were strongly and positively correlated, Pearson's $r = .955$, $p < .001$, and the association was confirmed by Spearman's rank correlation ($\rho = .997$, $p < .001$) (Table 4).

Table 4: Composite Scores Compared with the Criterion Mean and Correlation between Domains (N = 352)

Domain	M	SD	95% CI	t(351)	p
Parental education (13 items)	2.32	0.88	[2.23, 2.42]	−3.74	< .001
Diagnosis and measurement (9 items)	2.74	0.88	[2.65, 2.83]	5.10	< .001
Correlation between domains				r = .955	< .001

Note. One-sample t tests compare each composite with the criterion mean of 2.50. CI = confidence interval.

Discussion

This study examined how nurses in general hospitals of Northwest Nigeria interpret the role of parental education in the management of malnutrition among preschool children and which diagnostic criteria they endorse. Three findings stand out. First, nurses associated parental education with knowledge-related and service-use aspects of care but not with economic or sociocultural behaviours. Second, nurses broadly accepted anthropometric diagnosis, with strong support for MUAC and oedema but notable gaps in relation to weight-for-height and the use of age-appropriate indices. Third, the two domains were very strongly correlated.

Parental Education: A Knowledge and Service-Use Pathway

Nurses agreed that malnutrition occurs more frequently among children of less educated parents and that less educated parents were less likely to identify danger signs, to take timely management decisions, to access immunisation services and to provide colostrum. This is corroborated by the population-level evidence from Nigeria and other countries that maternal education is linked to reduced risk of stunting and underweight (Adekanmbi et al., 2013; Akombi, Agho, Hall, et al., 2017; Vollmer et al., 2017). The focus on awareness and recognition is also aligned with research demonstrating that nutrition-related knowledge is an independent predictor of child growth, regardless of formal education (Burchi, 2010; Fadare et al., 2019), and analyses that suggest knowledge and use of health services as important channels of action for education (Alderman & Headey, 2017; Frost et al., 2005). The association with colostrum may be plausible because early breastfeeding practices in Nigeria are suboptimal, and because of the protective effects of early and exclusive breastfeeding against infection and growth faltering (Victora et al., 2016).

In contrast, the nurses did not agree with the statements about parental education and purchasing power, income, use of unqualified practitioners, cultural beliefs, superstition, refusal of hospital care, early weaning and refusal of exclusive breastfeeding. In conjunction with the composite score below the criterion, this indicates that nurses do not consider education as the primary cause of these behaviours. An alternative view is that in the Northwest, poverty and food insecurity and sociocultural norms are felt to cross educational lines, with even educated caregivers feeling limited in their ability to purchase food and feed their children. This is consistent with evidence from northern Nigeria that household wealth and community characteristics have effects on their own (Akombi, Agho, Merom, et al.,

2017), and with evidence that the protective effect of maternal education may be small below secondary level (Makoka&Masibo, 2015). This is also aligned with qualitative and survey data from Ghana, which indicates that feeding decisions of caregivers are influenced by factors such as family and community factors and individual knowledge (Tette et al., 2015).

A second explanation is to do with item framing. A number of the rejected statements refer to negative behaviours experienced by nurses, such as adherence to cultural beliefs and/or refusal of hospital care, that may be considered to be uncommon among caregivers who do reach hospital. The sample was hospital-based, and nurses' experience is limited to families who have already presented for care; those families who do not present are invisible to nurses. This selection effect could cause nurses to underestimate the impact of sociocultural barriers in the broader community.

The results indicate that the identified areas of caregiver education for nursing practice – recognition of danger signs, early care seeking, immunisation and early initiation of breastfeeding – are areas that nurses already consider they can support with education. Even in the absence of food provision, systematic reviews indicate that complementary feeding education enhances child growth, especially in food-secure environments, and that food provision is also required in contexts of high levels of food insecurity (Keats et al., 2021; Lassi et al., 2013). Thus, the Northwest needs to combine nutrition counselling with social protection or food-based support, as the nurses doubted that education alone would be sufficient in improving purchasing power.

Diagnostic Criteria: Strengths and Gaps

The diagnosis composite score was above the criterion and nurses highly supported MUAC and bilateral oedema, two out of the three WHO indicators of severe acute malnutrition (WHO, 2013; WHO & UNICEF, 2009). Good MUAC support is likely to reflect the high level of MUAC based screening and admission in Nigeria's CMAM programme (Chitekwe et al., 2018). Interestingly, the severe threshold endorsed was 110 mm, the threshold that was used prior to the revision in 2009 to 115 mm which was based on the WHO Child Growth Standards (WHO & UNICEF, 2009). If used in practice, this older cut-off could result in some children with MUAC between 110 and 114 mm being overlooked, as these children are at high risk of death (Briend et al., 2012).

The weak endorsement of weight-for-height below −3 SD is the most important gap identified. Weight-for-height and MUAC identify different children and studies in Asia and

Africa have demonstrated that using MUAC alone would miss a significant proportion of children who are severely wasted by weight-for-height (Laillou et al., 2014; Grellety& Golden, 2016). Both indicators are thus recommended as standalone admission indicators (WHO, 2013). The low use of weight-for-height may be due to the difficulty of length/height measurement in busy wards, lack of reference tables or MUAC-only screening from community programmes.

Conceptual confusion is suggested by two endorsed criteria which have direct implications for training. Nurses strongly agreed that a BMI below 18.4 is a sign of malnutrition, but this is an adult threshold, in children under the age of 5 a BMI should be interpreted as a z-score on age-sex specific standards (WHO Multicentre Growth Reference Study Group, 2006). In addition, nurses concurred with low weight-for-age, which in the questionnaire is referred to as stunting, while the definition of stunting is based on length or height-for-age. Similarly, low serum albumin is a biochemical justification that may be applicable to oedematous malnutrition but is not included in the WHO diagnostic criteria (Bhutta et al., 2017). In contrast, nurses appropriately did not use fever or hypoglycaemia as diagnostic criteria. However, these are life-threatening complications which need to be considered and addressed during stabilisation (WHO, 2013) and training should focus on these as danger signs, not diagnostic markers.

These patterns are similar to those found in Ghana, where nurses' knowledge of malnutrition and how to manage it was rated as poor and those who knew about guidelines and had received training had better knowledge (Mogre et al., 2017). Most of these present respondents had practised for over 15 years and almost half had a diploma as the highest qualification. Adherence to superseded thresholds and adult-derived indices may be due to long experience without structured updating.

The importance of diagnostic accuracy at the hospital level is that general hospitals in the Northwest are referral centres for children with complicated malnutrition cases from community programmes. If a child is admitted using an old MUAC cut-off or is not admitted because weight-for-height is not measured, then that child is placed on a pathway to receive stabilisation feeds, antibiotics and close monitoring. If the criteria used in the hospital and the community were the same, and the same growth references used, then the risk of children being lost or misclassified at the point of transfer would be reduced. This integration would also enable hospital nurses to reinforce the messages community health workers give caregivers regarding their child's MUAC colour and the implications.

Relationship between Domains

There was a very high correlation between the parental education and diagnosis composites. Substantively, this could mean that a nurse who is sensitive to the social aspects of malnutrition is more involved in its clinical identification, with a holistic approach to nursing management. Such a correlation between conceptually different scales is however rare and should be treated with care. This could be due to some common method variance, as both scales were filled out by the same people, at the same time, and with the same response format, or perhaps a general tendency to agree or disagree. Very high internal consistency of the overall instrument is in the same direction (Taber, 2018). In future studies, the dimensional structure of these scales should be tested by factor analysis and reverse-worded items should be added.

Implications for Nursing Practice and Policy

The results indicate three priorities. In-service training for hospital nurses in the Northwest should be carried out to update the diagnostic thresholds as per WHO guidance, highlighting the 115 mm MUAC cut-off, the use of weight-for-height z-scores independently and the correct use of age-appropriate indices; length and height measurement skills should be included in this training. Second, caregiver counselling needs to keep on reinforcing recognition of danger signs, early care seeking, immunisation and early breastfeeding, and should not be expected to overcome economic barriers. Third, nurse managers should ensure the provision of WHO growth reference charts, calibrated scales and length boards for use by nurses to implement all the recommended criteria.

Strengths and Limitations

The strengths of this study are the three-stage random sampling of the three states, the high rate of return and the use of a validated instrument with good internal consistency. There are a number of limitations to be noted. The design was cross-sectional and perspectives were reported, thus the findings were based on what nurses believe and not what they do in practice. Parental education was assessed based on the nurse's perception, rather than the actual education of the parent/caregiver. The criterion of 2.50 is a convention and not an empirically determined cut-off. Diagnostic statements were also phrased the same as in the original instrument, and some statements were merged (e.g., weight-for-age and stunting). Data was only collected from state owned general hospitals in three states and therefore cannot be generalised to other states in the zone, primary health-care facilities and tertiary

hospitals. Lastly, no analysis was conducted to determine if there were any differences between perspective and qualification or experience.

Conclusion

Northwest Nigerian general hospital nurses believe that parental education affects malnutrition primarily through awareness of danger signs and decision making and use of preventive services and not through economic or cultural practices. They generally agree with anthropometric diagnosis but not uniformly with weight-for-height and use an outdated MUAC cut-off and adult BMI. Improving the nursing management of childhood malnutrition in the zone will involve nutrition education for caregivers and in-service training tailored to align the practice of diagnosis with the latest WHO standards.

Declarations

Ethical approval: Approved by the ethics committees of the state Ministries of Health and Hospitals Management Boards. Written informed consent was obtained from all participants.

Conflict of interest: The authors declare no conflict of interest.

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Data availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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