Nutritional knowledge and practices of mothers with malnourished children in a regional hospital in Northeast Namibia

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Abstract

Background. An estimated 159 million children under five are affected by malnutrition, with an additional 101 million children under five being underweight in sub-Saharan Africa. In Namibia, 24% of children under age 5 are stunted and 8% are severely stunted. The Kavango region has the highest rate of stunting (38.8%) in the country.

Objective. The purpose of the study was to determine and describe the nutritional knowledge and practices of mothers with malnourished children regarding feeding at Rundu Intermediate Hospital, Kavango East Region, Namibia.

Materials and Methods. A quantitative cross-sectional research design was used. A convenience sampling technique was used to select 199 mothers with malnourished children who were admitted to the pediatric ward. Data were collected via self-administered questionnaires with closed-ended questions.

Results. 51.8% of the mothers had correct nutritional knowledge regarding breastfeeding for six months before giving other food, and 74.4% believed that newborns should be initiated to breastfeeding within an hour after birth, while the same number breastfed their babies on demand. Furthermore, 35.6% of the participants followed appropriate practices regarding feeding.

Conclusions. Most mothers (51.8%) had appropriate nutritional knowledge. However, only a minority (35.6%) of the mothers had the appropriate practices regarding feeding their children. Hence, there was a knowledge/practice mismatch regarding the significance of exclusive breastfeeding during the first six months, and generally the vitality of breast milk to the child. These findings may be used to develop strategies and target interventions to create awareness among mothers regarding effective breastfeeding practices.

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Introduction

Child malnutrition is the leading public health problem and a major cause of child morbidity and mortality in developing countries.[1] The World Health Organisation refers to malnutrition as deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients.[2] Undernutrition is due to the insufficient intake of energy and other nutrients, overnutrition is due to the excessive consumption of energy as well as other nutrients, and micronutrient deficiency is due to the insufficient intake of specific vitamins and/or minerals.[3] In 2011, 26% (165 million) of children under the age of five were stunted (low length or height for age) globally.[4] Additionally, 42 million children under the age of five were affected by stunting almost annually.[5] An estimated 159 million (23.8%) children under five years of age were stunted in 2016, a 37.6% decrease from an estimated 255 million worldwide.[6]

Undernutrition as a problem in sub-Saharan Africa is a strong indicator of retarded growth and leads to more than 30% of deaths in children under five annually.[7] Approximately 101 million children under the age of five were underweight (low-weight-for-age) with about 21% of those living in sub-Saharan Africa.[8] Namibia has almost twice the percentage of moderately undernourished children and three times the percentage of severely undernourished children than what is expected for a country with its level of economic development.[7] Findings from the 2006/7 National Demographic Health Survey (NDHS) indicated that stunting prevalence among those under five was 23.6% compared to the stunting prevalence reported in the 2013/4 NDHS (24%), while 8%

were severely stunted.[9] In 2022, the prevalence of chronic malnutrition among children under five remained persistently high, with nearly one-quarter being stunted (23.6%) and underweight (24%). Kavango region was flagged being the highest (38.8%) in the country with regard to children under five stunting.[9]

Malnutrition still persists as a contributing cause of morbidity and mortality, as well as a hindrance for children and young adolescents to grow and develop to their full biological potential.[1] Unfortunately, little progress has been made in the last 15 years toward addressing the nutritional status of children in the under-five age group in Namibia.[10] Haludilu states that "underlying causes of undernutrition include insufficient availability and access of household food, inadequate care of children, low education levels and lack of information for the parents/guardians of children, insufficient health care services and an unhealthy environment (lack of sanitation and safe water)".[7] Education is one of the most significant factors that enables or empowers women to care for their children, which is an important determinant of children's growth and development.[1]

The Namibian National Policy on Infant and Young Child Feeding was implemented in 2003 and amended in 2011 and 2016.[11] This policy was implemented to empower all women to breastfeed exclusively for six months and continue with adequate complementary foods for two years or beyond and to create an environment that promotes, protects, and supports sound infant and young child feeding practices in Namibia.[11] The most recent Food and Nutrition Security Assessment identified the highest percentage of food-insecure households to be in the region of Kavango East (62%).[12] The prevalence of stunting in this region is also very high (38.8%).[13] Research has recommended that nurses should give health education to mothers on hygiene and exclusive breastfeeding and also enforce the importance of the monthly weight of all children under the age of five should be enforced.[14]

Most of the studies that were done on mothers' knowledge in terms of nutrition assessed the factors associated with malnutrition among children under the age of five years old,[14] and factors associated with undernutrition in the same study population.[7] Although studies have been done in Namibia on the knowledge and practices of mothers on nutrition, these only covered the Oshikoto region,[15] while Ashipala *et al.* and Nangolo concentrated on exclusive breastfeeding in the northern east and Khomas regions respectively.[11,16] One of these studies revealed that the majority of mothers with malnourished children were uneducated and thus they had no knowledge of how to take care of their children.[14] However, little is known about the knowledge and practices regarding feeding in Namibia. In view of the above, this study aimed to determine and describe the nutritional knowledge and practices of mothers with malnourished children at Rundu Intermediate Hospital, Kavango East Region, Namibia as a contribution to the existing bank of literature. Limited studies have assessed this issue in Namibia, therefore the findings of this study may be used to develop strategies and targeted interventions to create awareness among all mothers regarding breastfeeding their children effectively and giving a balanced diet.

Materials and Methods

Ethical issues

Ethical clearance was obtained from the Faculty of Health Sciences' School of Nursing Research and Ethics Committee (SoNREC 11/2022) and from the Ministry of Health and Social Services' Research Review Board (reference number: AFS 2021) before data collection. Written informed consent was obtained from each of the participants after the researcher had explained the study's aim, objectives, and methods to them.

Study design

This study used a quantitative cross-sectional research design to quantify the level of knowledge of mothers regarding child nutrition, as well as to describe their practices related to nutrition. In addition, a cross-sectional exploratory design using a questionnaire was used owing to its suitability for obtaining data on the knowledge and practices of nutrition. This design was relatively inexpensive and could be used for a short period.

Study site descriptions

The study was conducted in the pediatric ward of Rundu Intermediate Hospital, which is one of the regional referral hospitals in Namibia. It is situated in the northern part of Namibia along the Kavango River, which borders Angola, and has a population of 58,172. The hospital caters for referrals from the Kavango East, Kavango West, and the Zambezi regions, and also serves a large number of Angolan patients who live along the Kavango River. Rundu Intermediate Hospital had a bed capacity of 330, which are always at maximum capacity. Kavango East has large quantities of land that have high-quality fertile soil, which could be used for effective agricultural purposes, including growing corn and other crops. Furthermore, both the Kavango East and West regions are home to the Kavango River, which is well known for its various sources of food, such as fish that have high protein levels which are needed for human development, and a supply of adequate water for crop irrigation.

Study population

The study population comprised 199 mothers of malnourished children who had been admitted to the pediatric ward from March 2022 at Rundu Intermediate Hospital, Kavango East Region.

Inclusion and exclusion criteria

All mothers who had malnourished children admitted to the pediatric ward during the period under study were included in the population. Those who were willing to participate signed the consent form, were available at the time of data collection were included in the sample. Mothers with children who were not diagnosed with malnutrition, but were admitted to the pediatric ward during the period of study, including those that were not willing to participate were excluded from the study.

Sampling methods

A convenience sampling technique was used to select the participants, who were the mothers of malnourished children who were admitted and readily available in the pediatric ward for the dates and times of data collection. This sampling technique was used as it is reliably convenient for researchers in terms of ensuring the adequate representation of participants.

Sample size determination

The calculation was done as per Sekaran and Bougie.[17]
n= N/1+N x a^2
n= is the sample size
N= is the total population (which is 399 children)
a= is the total confidential limit at 5% or (which is 0.05)
n= 399/ 1+399(0.05) ^2
n= 399/ 1.9975
n= 199.7
n= 199 mothers with malnourished children.

Data collection procedure

The data for this study were collected using a structured, self-administered questionnaire that consisted of three sections, namely: the demographic characteristics of the participants, the participants' nutritional knowledge; and the practices of the mothers with malnourished children regarding feeding at Rundu Intermediate Hospital, Kavango East region. Anonymous, structured questionnaires with closed-ended questions were used to collect the required information from the 199 participants. As the questionnaire was in English, any respondents who were not conversant in English were provided translation by the researcher.

Data analysis

This study used SPSS version 27 in order to determine the level of nutritional knowledge and the practices of mothers with malnourished children regarding feeding. To make this determination, descriptive statistics, and the chi-square ($\chi 2$) test were adopted.

Results

It emerged from the study that of the 199 participants, 7% (n=14) were 20 years old, while participants aged 16 or who were between 42 and 47 years old were least represented, each with 0.5% (n=1) (see Table 1). Participants who only had one child were the majority at 30.7% (n=61), while those who had seven children only accounted for 1% (n=2) of the participants (see Table 2). A greater number of respondents were single (83.4% (n=166); just 16.6% (n=33) were married. The sample was mainly Catholic at 45.2% (n=90). Most of the respondents had attained secondary education (52.8%) (n=105), however, 28.1% (n=56) had only completed primary education. A further 18.1% (n=36) had completed tertiary education as their highest level of education. The final (1%) (n=2) had no formal education at all. Finally, the majority of the participants were unemployed (75.9%) (n=151) (see Table 1).

The results of this study on mothers' nutritional knowledge show that only 51.8% (n=103) of the participants believed they should breastfeed their babies for six months before giving them other food, while 74.4% (n=148) believed that new-borns should be initiated to breastfeeding within an hour after birth. The same number revealed that they breastfed their babies on demand. The majority of the participants (71.4%) (n=142) noted that their source of information when it comes to feeding their children is medical staff, with 28.6% (n=57) getting information from family members (see Table 2).

Furthermore, the findings of this study revealed that, when it comes to the mothers' practices regarding feeding, the majority (91%) (n=181) reported that they feed their children themselves, while 9% (n=18) said other family members feed their kids. Most of the respondents (93%) (n=185) reported feeding their children at night. With regards to whether a mother's first milk (colostrum) is very nutritious for a baby, a minority of the participants (29.6%) (n=59) strongly agreed, while almost half (49.7%) (n=99) agreed. The remainder were undecided (16.1%) (n=32); strongly disagreed 0.5% (n=1); or disagreed 4% (n=8). In addition, 8% (n=16) of the participants strongly agreed that it is not possible for a baby to survive on breast milk alone for six months, while 28.6% (n=57) agreed, 15.1% (n=30) were undecided, 34.2% (n=68) disagreed

Table 1. Demographic information of the participant (mother).

		Frequency	Percent
Marital status	Married	33	16.6
	Single	166	83.4
Religion	Anglican	55	27.6
	Catholic	90	45.2
	Evangelical	39	19.6
	Others	15	7.5
Highest level of education	No formal education	2	1.0
	Primary education	56	28.1
	Secondary education	105	52.8
	Tertiary education	36	18.1
Employment	Employed (formal)	21	10.6
	Employed (self)	27	13.6
	Unemployed	151	75.9
	Total	199	100.0

Table 2. Nutritional knowledge.

		Frequency	Percent
At what time should the new born be initiated to breastfeeding? Please indicate with an X in the appropriate box!	Within one hour after birth	148	74.4
	After one hour following birth	36	18.1
	After one day after birth	4	2.0
	I don't know/Not sure	11	5.5
How often should you breastfeed your baby? Please indicate with an X in the appropriate box!	On demand	148	74.4
	According to the timetable	31	15.6
	Not sure	19	9.5
	No answer	1	0.5
What is your source of information on feeding your child? Please indicate with an X all the appropriate responses in the box!	Family members	38	19.1
	Relatives	19	9.5
	Medical staff	142	71.4
	Total	199	100.0

and 14.1% (n=28) strongly disagreed. Additionally, 16% (n=8) of the participants strongly agreed that it is important to give a baby some water, honey, and other solid foods during the first six months, while 48.2% (n=96) agreed, 18.1% (n=36) were undecided, 17.6% (n=35) disagreed and 8% (n=16) strongly disagreed (see Table 3).

Table 4 presents the Chi-Square tests of association. The p-value is 4.732a which is statistically significant at a 5% level of significance based on 3° of freedom and the likelihood ratio, the p-value is 0.065, and statistics is 7.23 based on 3° of freedom (see Table 4).

Discussion

Nutritional knowledge of mothers with malnourished children regarding feeding

The majority of the participants in this study demonstrated accurate knowledge regarding when to breastfeed exclusively. Similar results have been reported in other studies, such as research by Akeredolu, Osisanya, Seriki-Mosadolorun and Okorafor,[18] who stated that the majority (75%) of their respondents breastfed their children, although only 31.7% of the mothers exclusively breastfed for six months, while 43.3% added complementary foods for their children at four to six months of age. However, these findings are similar to a study by Ashipala *et al*.[16] who indi-

Table 3. Nutritional practices.

		Frequency	Percent
Who feeds the child? Please indicate with an X in the appropriate box!	Myself	181	91.0
	Other family members	18	9.0
Does the child feeds at night? Please indicate with an X in the appropriate box!	Yes	185	93.0
	No	14	7.0
First milk (colostrum) is very nutritious to the baby.	Strongly agree	59	29.6
	Agree	99	49.7
	Undecided	32	16.1
	Strongly disagree	1	0.5
	Disagree	8	4.0
It is not possible for a baby to survive on breastfeeding for six months.	Strongly agree	16	8.0
	Agree	57	28.6
	Undecided	30	15.1
	Strongly disagree	28	14.1
	Disagree	68	34.2
It is important to give the baby some water, honey and other solid foods after birth during the first six months	Strongly agree	16	8.0
	Agree	96	48.2
	Undecided	36	18.1
	Strongly disagree	16	8.0
	Disagree	35	17.6
Poor/thin breast milk makes the Child prone to malnutrition	Strongly agree	49	24.6
	Agree	108	54.3
	Undecided	14	7.0
	Strongly disagree	8	4.0
	Disagree	20	10.1
Nutritious foods are expensive.	Strongly agree	100	50.3
	Agree	62	31.2
	Undecided	17	8.5
	Strongly disagree	10	5.0
	Disagree	10	5.0
When pregnant you should stop breastfeeding	Strongly agree	27	13.6
	Agree	82	41.2
	Undecided	58	29.1
	Strongly disagree	6	3.0
	Disagree	26	13.1
Does breast milk protect your child from illnesses?	Strongly agree	28	14.1
	Agree	109	54.8
	Undecided	39	19.6
	Strongly disagree	2	1.0
	Disagree	21	10.6
Feeding should be stopped during baby' illness.	Strongly agree	28	14.1
	Agree	109	54.8
	Undecided	39	19.6
	Strongly disagree	2	1.0
	Disagree	21	10.6
	Total	199	100.0

cated that HIV-positive and working mothers can still breastfeed exclusively by giving expressed breast milk. While 38 (63%) of the respondents indicated that a mother should not introduce other food to an infant before they are six months old.

This study also discovered that most of the respondents 53% (n=105) had completed secondary education, while 28.1% (n=56) only had a primary education. Although only a few (18%) (n=36) of mothers had their tertiary education, as their highest level of education. This study's findings differ from a study done by Kajjura *et al.*,[19] who ascertained that the majority of mothers only had a primary school education or no formal education. This suggests that those mothers could have experienced difficulty comprehending the available nutrition education messages. In addition, a similar study indicated that a mother's level of education has an inverse relationship with household wealth and stunting.[20]

The majority of the participants (74.4%) (n=148) in this study believed that newborns should be initiated to breastfeeding within an hour of their birth. The same number (74.4%) (n=148) breastfed their babies on demand, with 15.6% (n=31) feeding them according to a timetable. This is all in line with a study done by Manohar *et al.*,[21] which showed that 60% of mothers know that breastfeeding should be initiated as soon as possible after birth. The remaining mothers delayed breastfeeding for more than one hour, with some only breastfeeding their babies after one day. A study conducted by Pallewaththa *et al*.[22] showed that only 35% of the mothers knew about initiating breastfeeding within an hour, while 62% knew how long to breastfeed exclusively and 81% knew when to introduce complementary feeding. Similarly, it was reported that only 36% of infants were breastfed within an hour of birth, while 15% did so after 24 hours.[23] Only about 50% of children were exclusively breastfed for up to six months.

The majority of the participants in this study pointed out that their source of information regarding feeding their children is medical staff, with only a few 28.6% (n=57) getting their information from family members. This is in contrast to a study by Lokossou *et al*.,[24] who reported that amongst the majority of mothers who did not go to school, their source of information remains elders, which perpetuates the cycle of erroneous information being shared.

Practices of mothers with malnourished children regarding feeding

A very large number of the respondents (93%) (n=185) to this study fed their children at night. This is in line with the study findings of Ickes *et al*.[25] who reported that, post-program children had higher dietary diversity scores (3.0 *vs*. 2.1, P=0.001) than comparison group children, and were fed more frequently (3.0 *vs*. 2.1 times per day, P=0.001). Similarly, a study undertaken by Manohar *et al*.[21] reported that 13.3% of babies were fed more than eight times per day, while 37.5% were fed six to eight times, 40% were fed four to six times, and only 9.16% were fed on demand. Moreover, the findings of this study revealed that the majority (82.1%) of the participants indicated they knew about the impor-

Table 4. Chi-Squares tests of association: cross-tabulations.

Cross tabulation	Chi-square value	n	df	p-value
At what time should the new-born be initiated to breastfeeding?	Pearson Chi-Square (4.732a)	199	3	0.193
	Likelihood Ratio (7.23)	199	3	0.065
How often should you breastfeed your baby?	Pearson Chi-Square (2.725a)	199	3	0.436
	Likelihood Ratio (2.132)	199	3	0.435
How long should you breast feed before giving other feeds?	Pearson Chi-Square (8.924a)	199	15	0.881
	Likelihood Ratio (13.269)	199	15	0.582
When should a mother start adding foods to breastfeeding?	Pearson Chi-Square (13.8a)	199	16	0.614
	Likelihood Ratio (16.049)	199	16	0.45
After introducing other solid foods, how long should you continue breast feeding?	Pearson Chi-Square (26.697a)	199	26	0.425
	Likelihood Ratio (30.575)	199	26	0.244
What is your source of information on feeding your child?	Pearson Chi-Square (0.438a)	199	2	0.803
	Likelihood Ratio (0.457)	199	2	0.796
Who feeds the child?	Pearson Chi-Square (7.118a)	199	1	0.008
	Likelihood Ratio (5.456)	199	1	0.02
Does the child feeds at night?	Pearson Chi-Square (2.994a)	199	1	0.084
	Likelihood Ratio (1.843)	199	1	0.175
First milk (colostrum) is very nutritious to the baby.	Pearson Chi-Square (11.404a)	199	4	0.022
	Likelihood Ratio (16.211)	199	4	0.003
It is not possible for a baby to survive on breastfeeding for six months.	Pearson Chi-Square (0.702a)	199	4	0.951
	Likelihood Ratio (0.706)	199	4	0.951
It is important to give the baby some water, honey and other solid foods during the first six months after birth.	Pearson Chi-Square (2.349a)	199	4	0.672
	Likelihood Ratio (2.581)	199	4	0.63
Poor/thin breast milk makes the Child prone to malnutrition.	Pearson Chi-Square (5.7a)	199	4	0.223
	Likelihood Ratio (5.133)	199	4	0.274
Nutritious foods are expensive	Pearson Chi-Square (4.121a)	199	4	0.39
	Likelihood Ratio (4.105)	199	4	0.392
When pregnant you should stop breastfeeding	Pearson Chi-Square (1.168a)	199	4	0.883
	Likelihood Ratio (1.21)	199	4	0.876
Does breast milk protect your child from illnesses?	Pearson Chi-Square (2.15a)	199	4	0.708
	Likelihood Ratio (2.587)	199	4	0.629
Feeding should be stopped during baby' illness	Pearson Chi-Square (2.15a)	199	4	0.708
	Likelihood Ratio (2.587)	199	4	0.629

tance of the first milk (colostrum). Only 17.9% disagreed. By comparison, Manohar *et al*.[21] reported that more than 75% of mothers know the importance of colostrum. Similarly, Desalegn *et al*.[26] revealed that children who did not take the first milk (colostrum) after their birth were more stunted than those who did. In addition, 8% (n=16) of the participants in this study strongly agreed that it is not possible for a baby to survive on breastfeeding alone for six months, while 28.6% (n=57) agreed, 15.1% (n=30) were undecided, 34.2% (n=68) disagreed and 14.1% (n=28) strongly disagreed. Similar findings were reported by Manohar *et al*.,[21] who concluded that out of 120 mothers, 89% agreed that children should be breastfed for six months exclusively, but in practice, only 65% did so.

When asked if they believed it is important to give a child some water, honey, and other solid foods during the first six months, 16% (n=8) indicated they strongly agreed, 48.2% (n=96) agreed, 18.1% (n=36) were undecided, 17.6% (n=35) disagreed and 8% (n=16) strongly disagreed. These findings are in line with Nayak *et al.*, who noted that 40% (of children) are not exclusively breastfed by their mothers to six months.[27] Contrary, another study revealed that 89% of mothers know that the addition of fruits and vegetables is beneficial to a child.[21]

Moreover, in this study, 24.6% (n=49) of the participants strongly believed that poor/thin breast milk makes a child prone to malnutrition, while the majority (54.3%) agreed. These findings are in line with the findings of a study conducted by Rakotomanana *et al*.,[28] who reported that mothers who restrict certain foods from their children were found to have a statistically significant association (P<0.001) of having malnourished children with an odds ratio of 2.57. However, these findings were in contrast with those of Awasthi *et al*.,[29] who reported that malnutrition was not a health hazard. Additionally, the findings of the present study revealed that only a few participants (14.1%) (n=28) strongly agreed that breast milk protects a child from illnesses, while 54.8% (n=109) agreed. Similarly, it was stated that mothers who provided nutritious food to their children during their infancy and childhood were found to have normal-weight children, as compared to the mothers who gave their children bakery products and candies or chocolates (P<0.001).[28] Moreover, the findings of this study revealed that 14.1% (n=28) of participants strongly believed that feeding should be stopped during a baby's illness, while 54.8% (n=109) agreed, 1% (n=2) were unsure, 10.6% (n=21) disagreed and 19.6% (n=39) strongly disagreed. This is in line with a study that reported that the frequency of feeding a child should depend on their demands, except in some situations like the baby not accepting or being ill.[21]

Limitations of the study

This study had some limitations regarding the research instrument, as the questionnaire contained only close-ended questions. By implication, this meant participants would have limited response options. Additionally, the data source was a self-administered questionnaire by mothers with malnourished children admitted to the pediatric ward of a selected hospital regarding their own perceptions, rather than direct observation of practices and knowledge. Participants may have interpreted questions differently when completing the questionnaires, thus the aim of the specific question may have been lost because of how it was interpreted.

Conclusions

The findings of this study revealed that the majority of mothers have adequate nutritional knowledge regarding feeding their children. However, only a minority (35.6%) of the mothers had the appropriate practices regarding feeding their children. Hence, there is a knowledge/practice mismatch regarding the significance of exclusive breastfeeding during the first six months, and generally the vitality of breast milk to the child, as well as the overall knowledge of the importance of a balanced diet to children under the age of five years. These findings may be used to develop strategies and target interventions to create awareness among all mothers regarding breastfeeding their children effectively, and this entails education of mothers on the significance of nutrition, and its dearth consequences.

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