

Infant and young child feeding practices of caregivers in Copesville, Pietermaritzburg, KwaZulu-Natal

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Background: Although infant and young child feeding (IYCF) recommendations are widely accepted in South Africa, inappropriate IYCF practices still exist, leading to malnutrition in children.

Objective: To investigate the IYCF practices of caregivers in Copesville, Pietermaritzburg (PMB).

Design: A cross-sectional study was conducted.

Setting: Masons Clinic, Copesville, PMB.

Subjects: Two-hundred and fifty caregivers older than 18 years of age caring for a 6–24-month-old child at the time of the study.

Outcome measures: A face-to-face questionnaire was developed using recent, relevant literature and was validated for the study.

Results: The mean age of the caregivers was 32.25 (10.42) years. About 96% ($n = 239$) of infants were ever breastfed. The mean age at which breastfeeding was stopped was 5.9 ± 4.3 months. Mothers who were still breastfeeding planned to continue breastfeeding for a mean duration of 12.6 ± 5.6 months. About 60% ($n = 149$) of infants were started on solids at the appropriate age of 6 months. Lennon Entressdruppels (16.9%; $n = 14$), sugar water (15.7%; $n = 13$) and fruit and vegetables (13.3%; $n = 11$) were fed before the age of six months. Forty-nine caregivers (19.6%) consulted a traditional healer regarding IYCF. Non-edible items fed to cleanse the stomach included toothpaste and polish (5.6%; $n = 8$) and disinfectant solution (1.7%; $n = 1$).

Conclusions: Caregivers should be educated on the benefits of continued breastfeeding until two years or beyond and the importance of starting solids at the appropriate age of six months. The potential dangers to the health of infants of feeding non-edible items should also be highlighted.

Keywords breastfeeding, caregivers, complementary feeding, feeding practices, infant and young child

Introduction

Malnutrition encompasses undernutrition (wasting, stunting, underweight), micronutrient deficiencies, overweight, obesity and non-communicable diseases.¹ All forms of malnutrition remain unacceptably high across all regions of the world.² Globally, 20.5 million children are born with low birthweight, 149.2 million are stunted, 45.4 million children are wasted, while 38.9 million are overweight.² In South Africa (SA), children under five years of age are most affected by malnutrition compared with other age groups; 27% are stunted, 3% are wasted, 6% are underweight, and 13% are overweight.³ Inappropriate infant and young child feeding (IYCF) practices are recognised as a cause of stunting and underweight in children.⁴ Protecting, promoting and supporting appropriate IYCF is crucial to ensuring that children grow well, are protected from preventable illness and develop to their full potential.⁵

It is a global public health recommendation that infants should be exclusively breastfed for six months in order for them to grow and develop optimally. Thereafter, infants should receive nutritious and safe complementary foods to meet their evolving nutritional requirements with breastfeeding continuing for up to two years or beyond.⁵ Breastfeeding for longer periods is associated with lower infectious morbidity and mortality, fewer dental malocclusions and higher intelligence compared with children who are breastfed for shorter periods or not at all. Evidence suggests that breastfeeding may also protect

against overweight and diabetes later in life.⁶ National studies in SA have revealed an improvement in exclusive breastfeeding from 1998 (6.9%) to 2016 (31.6%). However, the duration of breastfeeding continues to be a challenge in SA, as the mean duration of any breastfeeding decreased from 15.6 months in 1998 to 12.2 months in 2016.⁷ Barriers to breastfeeding include a lack of time for breastfeeding, maternal exhaustion or isolation, lack of familial support and lack of cultural acceptance.⁸ Mothers living with human immunodeficiency virus (HIV) are also less likely to breastfeed their children compared with HIV-negative mothers due to fear of HIV transmission.⁹ Formula feeding has increased due to globalisation, increasing availability of formula milk in the supermarket, and promotion of formula milk through advertising by different media. There is currently a shift from exclusive breastfeeding to formula feeding.¹⁰

Appropriate complementary feeding is important for maintaining health and ensuring normal development in children.¹¹ Complementary feeding is defined as the period during which other foods or liquids are provided along with breastmilk.¹¹ Complementary feeding must be timely, adequate, safe, and age-appropriate.⁵ Inappropriate complementary feeding during infancy is known to contribute to malnutrition in young children.¹¹ In SA, complementary feeding practices are suboptimal and urgent action is needed to improve these practices.¹² The early introduction of foods and liquids other than breastmilk is common. Water and other liquids (e.g. tea and

herbal mixtures) are commonly fed to infants younger than six months of age. Maize porridge is a common first food for infants; however, commercial infant cereal is also widely used in SA.¹²

Parents often consult traditional healers before medical practitioners.¹³ Traditional healers are considered important and are often consulted to obtain traditional preparations (*muthi*) for use in infants.¹⁴ Use of remedies prescribed by traditional healers can lead to poisoning and is a common cause of death in SA. Herbal intoxication that causes liver and kidney damage can lead to increased mortality in children.¹³ A study conducted in Cape Town, SA, found that mothers used traditional preparations (*muthi*) in infants to treat colic-like symptoms, referred to as 'wind'. Some mothers had planned to use the traditional preparations even after the colic-like symptoms had resolved. Over half of the infants being given traditional herbal mixtures received the preparation by one month of age. The length of time that an infant received the mixture varied from two weeks to an intended four years.¹⁴ A Western Cape study also found that some mothers gave their infants herbal medicines to prevent or treat cramps, flatulence and jaundice.¹⁵

Because inappropriate IYCF practices of caregivers can contribute to malnutrition, it is crucial to investigate IYCF practices. Identifying inappropriate IYCF practices of caregivers can assist in identifying interventions to combat child malnutrition. Therefore, the study objective was to investigate the IYCF practices of caregivers in Copesville, Pietermaritzburg (PMB), KwaZulu-Natal (KZN). Copesville was chosen because it is one of the areas in the uMgungundlovu district with the highest proportion of underweight children (10%) under two years of age.¹⁶ Inappropriate IYCF practices are also a challenge in Copesville and can be attributed to high rates of unemployment and poverty in the area.¹⁷ In addition, Copesville has a population with varied socioeconomic levels, including those living in informal settlements with poor infrastructure and services.¹⁸ Masons Clinic was chosen as it is the only Department of Health clinic that serves the population of Copesville in PMB.

Methods

Study design

A cross-sectional study was conducted as data were collected from all participants at one point in time. In addition, the participants were selected based on the inclusion criteria set for the study.

Study site

This study was conducted at Masons Clinic, which is located in Copesville, PMB, KZN and falls under the uMgungundlovu district, Msunduzi Municipality. The clinic sees an average of 523 children under 5 years of age per month.¹⁶

Study population

The study population included all caregivers who brought their infants and young children (IYC) to Masons Clinic and who met the study inclusion criteria. The study included caregivers older than 18 years of age who were either the primary or the secondary caregiver to a 6–24-month-old child at the time of the study. The caregiver had to be living with the child at the time of the study to be included in the study.

Sample selection

Convenience sampling was used to recruit caregivers. Caregivers who met the study inclusion criteria and who were present at the clinic on the days of data collection were invited to participate in the study.

Face-to-face questionnaire

A face-to-face questionnaire was developed in English for the purpose of this study. It was developed in accordance with the study objective, using simple language, while avoiding leading or ambiguous questions. The questionnaire consisted of three sections and included both open-ended and closed-ended questions. Section A collected data on the age, gender, weight and length/height of the IYC as well as sociodemographic and socioeconomic characteristics of the caregiver. Section B investigated cultural practices that may be associated with IYCF practices, while section C collected data on IYCF practices, including starting and stopping of breastmilk, formula, solids and cow's milk and formula milk preparation and storage. However, not all data are presented in this paper. An isiZulu speaking research assistant translated the English questionnaire into isiZulu to accommodate the isiZulu-speaking caregivers. Another isiZulu speaking researcher translated the questionnaire back into English to check the accuracy of the translation. To ensure validity, the questionnaire was developed using relevant scientific literature.^{19–22} The study supervisor, who is an expert in the field of nutrition, ensured content validity of the questionnaire by ensuring that the questions were aligned with the study objective, that there was a logical flow to the questions and that there were no leading, ambiguous or confusing questions. A statistician checked that the questions in the questionnaire could be statistically analysed.

A pilot study was conducted prior to the main study to validate the questionnaire by identifying any ambiguity or misunderstanding in the questionnaire and to determine the time required to answer the questionnaire. The pilot study was conducted at the Northdale Hospital Gateway Clinic in PMB using 10 caregivers who met the study inclusion criteria and consented to participate in the study. Northdale Hospital Gateway Clinic was selected as it was not a site for the main data collection. The pilot study participants understood all the questions in the questionnaire.

Data collection

Data were collected at Masons Clinic, Copesville, PMB between October 2022 and November 2022. A trained research assistant assisted with data collection. The researcher trained the research assistant prior to data collection on the objective of the study and the process to follow during data collection. Interviewing skills, good clinical practices, importance of consent, ethics and professionalism, body language and embracing cultural differences during data collection were also covered during the training. Caregivers were screened by the researcher and research assistant to determine whether they met the study inclusion criteria, while they waited to consult with the nurse. All caregivers who met the inclusion criteria were invited to participate in the study. The researcher and research assistant explained the purpose of the study, objective, benefits and any potential discomforts, confidentiality and the time it would take to complete data collection. Caregivers who were willing to participate in the study were asked to read and sign a consent form before commencing with data collection. The research assistant conducted the questionnaires at a table in the waiting room of Masons Clinic. Only one caregiver was

interviewed at a time. The average time taken for caregivers to answer the questionnaire was 20–25 minutes. The research assistant asked the questions according to the sequence in the questionnaire. The research assistant recorded the answers in the questionnaire while interviewing the caregiver.

Ethics approval

Ethics approval was obtained from the University of KwaZulu-Natal, Biomedical Research Ethics Committee (Reference number: BREC/00001274/2020). Permission to conduct the study was also obtained from the KZN Department of Health Research Committee (Reference number: KZ-202101-008) and from the uMgungundlovu District Office Manager. Written consent was obtained from all participants before they took part in the study. The consent form introduced the researcher, the objective of the study and explained the data collection process. The participants were informed that the study did not pose any risks and that they could withdraw from the study at any time. Participants were also assured that their identities would be protected and confidentiality would be maintained.

Statistical analysis

Data were analysed using Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp, Armonk, NY, USA). Descriptive statistics, namely frequencies and percentages for categorical data and means and standard deviations for numerical data, were calculated.

Results

Table 1 indicates the characteristics of the caregivers. A total of 250 caregivers participated in the study, with a mean age of 32.25 ± 10.42 years. The adult participants included mothers (74.0%; *n* = 185), grandmothers (17.2%; *n* = 43) and other caregivers (8.8%; *n* = 22). Just over 44% (*n* = 111) of the caregivers had completed some high school as their highest level of education and 55.2% (*n* = 138) had previously cared for two children under the age of two years, including the child present at data collection. Of the 250 IYC who participated in the study, 50.8% (*n* = 127) were male and 49.2% (*n* = 123) were female. The mean age of the IYC was 12.06 ± 4.87 months (**Table 1**).

Table 2 lists the IYCF practices of caregivers related to breastfeeding and formula feeding.

About 96% (*n* = 239) of infants were ever breastfed, while 4% (*n* = 10) were never breastfed. The mean age at which breastfeeding was stopped for those for whom breastfeeding had already stopped (*n* = 122) was 5.9 ± 4.3 months. Items other than breastmilk given to infants before the age of six months included Lennon Entressdruppels (16.9%; *n* = 14), sugar water (15.7%; *n* = 13) and fruit and vegetables (13.3%; *n* = 11). IYC who were still being breastfed were due to be breastfed for a further period of 12.6 ± 5.6 months. About 49% (*n* = 122) of infants were never formula fed, while 4.8% (*n* = 12) were started on formula at birth (**Table 2**).

Table 3 includes the age at which solids were started, reasons for starting solids and first solids fed.

About 60% of infants (*n* = 149) were started on solids at the appropriate age (i.e. at six months of age). The early introduction of solids was noted in 23.2% (*n* = 58) of infants, while the late introduction of solids was noted in 17.2% (*n* = 43). For

Table 1: Characteristics of the caregivers (*n* = 250) and infants and young children (*n* = 250)

Characteristics of caregivers	Unit
	Mean (SD)
Age (years)	32.25 (10.42)
Relationship to infant or young child	<i>n</i> (%)
Mother	185 (74.0)
Grandmother	43 (17.2)
Other	22 (8.8)
Aunt	6 (2.4)
Father	11 (4.4)
Stepfather	1 (0.4)
Uncle	4 (1.6)
Highest level of education completed	<i>n</i> (%)
No formal education	21 (8.4)
Some/all primary school	58 (23.2)
Some high school	111 (44.4)
Matric	55 (22.0)
Tertiary education	5 (2.0)
Number of children under two years of age cared for previously (including the child present at data collection)	<i>n</i> (%)
1	68 (27.2)
2	138 (55.2)
3	27 (10.8)
≥ 4	17 (6.8)
Characteristics of infants and young children	Mean (SD)
Age (months)	12.06 (4.87)
Gender	<i>n</i> (%)
Male	127 (50.8)
Female	123 (49.2)

SD = standard deviation

infants who were introduced to solids early (before six months) (*n* = 58), the main reasons were infant crying (43.1%; *n* = 25) and infant not getting full (25.9%; *n* = 15). For infants who were introduced to solids late (after six months), the main reasons were infant crying (30.2%; *n* = 13), clinic advice (18.6%; *n* = 8) and infant not getting full (16.3%; *n* = 7). Maize meal porridge (36.0%; *n* = 90) was the most common first solid fed, followed by fruit and vegetables (21.6%; *n* = 54) and infant cereal/porridge (18.0%; *n* = 45) (**Table 3**).

Table 4 indicates cultural practices related to IYCF.

Forty-nine caregivers (19.6%) consulted a traditional healer regarding IYCF. About 57% (*n* = 142) of IYC were given items to cleanse their stomachs. Items given to cleanse their stomachs included medicine (33.8%; *n* = 48), herbs (15.5%; *n* = 22) and other items (40.8%; *n* = 58). The other items given included gripe water (74.1%; *n* = 43), Phipp’s Milk of Magnesia (13.8%; *n* = 8), *Amazoyi* (a liquid mixture containing traditional herbs) (5.2%; *n* = 3) and *Bonnisan* (a digestive tonic water believed to treat colic and improve appetite) (3.4%; *n* = 2) (**Table 4**).

Discussion

The objective of this study was to investigate the IYCF practices of caregivers in Copesville, PMB, KZN. The current study found that most infants were ever breastfed, which is in line with

Table 2: Infant and young child feeding practices related to breastfeeding and formula feeding

Factor	Unit
	<i>n</i> (%)
Never breastfed (<i>n</i> = 250)	10 (4.0)
Ever breastfed (<i>n</i> = 250)	239 (95.6)
Still breastfeeding (<i>n</i> = 250)	117 (46.8)
When breastfeeding was stopped (for those who had already stopped) (<i>n</i> = 122)	Mean (SD)
Age (months)	5.9 (4.3)
Items other than breastmilk given to infants before the age of six months (<i>n</i> = 83)	<i>n</i> (%)
Allergex	2 (2.4)
<i>Amahewu</i> ^a	3 (3.6)
Bean soup	2 (2.4)
Instant porridge	6 (7.2)
Danone (yoghurt)	2 (2.4)
Lennon Entressdruppels	14 (16.9)
Maize meal porridge	5 (6.0)
Dairy products (<i>maas</i> , yoghurt)	3 (3.6)
Purity mixture fruit and vegetables	5 (6.0)
Fruit and vegetables	11 (13.3)
Rooibos tea	6 (7.2)
Juice/squash	8 (9.6)
Sugar water	13 (15.7)
Traditional medicine	5 (6.0)
Not mentioned	5 (6.0)
Reasons why infants were never breastfed (<i>n</i> = 10) ^b	<i>n</i>
Mother had a disease	1
Mother had high viral load	2
Mother did not want to breastfeed	1
Mother was sick	1
Social case (mother deceased, or neglected the infant after birth)	1
No reason given	4
If the infant or young child was still being breastfed (<i>n</i> = 117), for how long did the mother plan to breastfeed	Mean (SD)
Time (months)	12.6 (5.6)
Age at which formula was started (<i>n</i> = 250)	<i>n</i> (%)
Never	122 (48.8)
At birth	12 (4.8)
< 1 month	2 (0.8)
1–6 months	82 (32.8)
>6 months	32 (12.8)
Age at which formula was stopped (<i>n</i> = 250)	<i>n</i> (%)
Not applicable (never started)	122 (48.8)
5 months	1 (0.4)
12–18 months	10 (4.0)
23 months	1 (0.4)
Still consuming	116 (46.4) ^c

^a*Amahewu* is a fermented maize meal porridge drink.

^bRefers to infants who were never breastfed.

^cPercentage of caregivers who were still formula feeding (*n* = 116).

other studies^{12,23,24}, which also reported a high rate of infants who were ever breastfed. However, breastfeeding until two years of age or beyond was not sustained, which is in contrast to recommendations that infants should continue to be breastfed for two years or beyond.¹⁹ Although complementary

Table 3: Age at which solids were started, reasons for starting solids and first solids fed

Introduction of solids (<i>n</i> = 250)	<i>n</i> (%)
Early introduction of solids (before six months of age)	58 (23.2)
Appropriate introduction of solids (at six months of age)	149 (59.6)
Late introduction of solids (after six months of age)	43 (17.2)
Reasons for early introduction of solids (before six months of age) (<i>n</i> = 58) [#]	
Not getting full	15 (25.9)
Clinic advice	3 (5.2)
Infant crying	25 (43.1)
Family advice	7 (12.1)
Other reasons	5 (8.6)
Reasons for late introduction of solids (after six months of age) (<i>n</i> = 43) [#]	
Not getting full	7 (16.3)
Clinic advice	8 (18.6)
Infant crying	13 (30.2)
Family advice	2 (4.7)
Other reasons	3 (7.0)
First solids fed (<i>n</i> = 250) [#]	<i>n</i> (%)
Maize meal porridge	90 (36.0)
Infant cereal/porridge	45 (18.0)
Yoghurt	6 (2.4)
White bread	1 (0.4)
Fruit and vegetables	54 (21.6)
Eggs	2 (0.8)
Potatoes, mashed	29 (11.6)
Soya mince	1 (0.4)
Soup	4 (1.6)
<i>Amahewu</i> ^a	3 (1.2)
Unsure	1 (0.4)

[#]Some participants did not answer; therefore, percentages do not add up to 100%.

^a*Amahewu* is a fermented maize meal porridge drink.

Table 4: Cultural practices related to infant and young child feeding.

Cultural practices	<i>n</i> (%)
A traditional healer was consulted regarding the feeding of the infant or young child (<i>n</i> = 250)	49 (19.6)
Items were given to the infant or young child to cleanse their stomach (<i>n</i> = 250)	142 (56.8)
Items given by caregivers to infants or young children to cleanse their stomach (<i>n</i> = 142)	
Medicine	48 (33.8)
Herbs	22 (15.5)
Soup	6 (4.2)
Toothpaste and polish	8 (5.6)
Other items	58 (40.8)
Other items (<i>n</i> = 58)	<i>n</i> (%)
<i>Amazoyi</i> ^a	3 (5.2)
Boiled water	1 (1.7)
<i>Bonnisan</i> ^b	2 (3.4)
Gripe water	43 (74.1)
Phipp's Milk of Magnesia	8 (13.8)
<i>Ushibhoshi</i> ^c	1 (1.7)

^a*Amazoyi* is a liquid mixture containing traditional herbs.

^b*Bonnisan* is a digestive tonic water believed to treat colic and improve appetite.

^c*Ushibhoshi* is a disinfectant solution used to kill bacteria.

foods should be introduced from 6 months of age, breastfeeding remains an important source of nutrients beyond this age.²⁵ Continued breastfeeding protects IYC against mortality and morbidity from infectious diseases.⁶ Mothers also benefit from continued breastfeeding as it reduces the risk of breast and ovarian cancer and type 2 diabetes²⁶ and increases the gap between pregnancies.⁶ The practice of not breastfeeding IYC until two years of age or beyond remains a challenge and a public health concern.

Just over half of the caregivers in the current study gave infant formula at some point. Given the high cost of formula, this finding seems to contradict the high rates of unemployment and poverty seen in Copesville.¹⁷ Despite the benefits associated with breastfeeding, many women choose to formula feed their infants.²⁷ A study conducted in Johannesburg and Cape Town, SA found that women chose to formula feed over breastfeeding because formula milk is similar to breastmilk, formula feeding is a lifestyle choice and mothers have the right to choose what is best for their infants, according to their circumstances.²⁷ It seems that the current approach of simply discouraging formula and encouraging breastfeeding has failed to convince most mothers.²⁷ This may be due to the marketing of formula as a convenient feeding method for modern women. Existing strategies that support breastfeeding in SA should be strengthened to counteract the messages that promote formula feeding.

The current study found that just over half of the infants were started on solids at the appropriate age of six months. Complementary feeding should be initiated at six months in order to optimise nutrition, development, survival and growth of children.⁶ Once an infant is six months old, breastmilk alone cannot meet the nutritional requirements, and the introduction of complementary feeding is recommended.¹⁹ The finding that some infants were started on solids at six months due to clinic advice indicates that caregivers may be paying attention to information on complementary feeding given at clinics. Interestingly, the current study noted the early introduction of solids in just under a quarter of the infants. This is contradictory to findings from a review of complementary feeding practices in SA, which found a high prevalence of early introduction of solids and liquids other than breastmilk.¹² In the current study, crying of the infant and the infant not getting full were given as reasons for the early introduction of solids. This is in line with the findings of a study conducted in Limpopo SA, where mothers reported that baby crying a lot, baby is hungry and baby not sleeping were reasons for the early introduction of solids.²⁸ However, these are not indicators for starting infants on solids. The current study found that most infants were started on maize meal porridge as the first complementary food, followed by fruit and vegetables. This is encouraging, as fruit and vegetables are important sources of micronutrients. Maize meal was also found to be the most common food for infants in SA, with a progressive reliance on commercial cereals.¹²

The findings of the current study suggest that some caregivers may have received information on IYCF from traditional healers. This suggests a need for traditional healers to be included as recipients of nutrition education on appropriate IYCF practices. Some infants received gripe water to cleanse their stomachs. The practice of giving other fluids before the age of six months is of public health concern as this interferes with exclusive breastfeeding and may cause infections.²⁹ Bland et al. also reported that gripe water was the most common oral

medication given for 'colic' and 'wind'.²⁹ The alcohol content in gripe water (4.4% v/v) may be partially responsible for its relaxation and sleep-inducing properties.²⁹ Feeding gripe water to an infant before six months of age is potentially harmful as it may delay the establishment of breastfeeding and reduce breast milk supply, which may lead to cessation of breastfeeding or early introduction of solids.³⁰ The current study found that some IYC were fed non-edible items such as toothpaste and polish. It is of concern that non-edible items were fed to IYC as these items may pose a potential health risk.³¹ Of greater concern is the fact that *ushibhoshi* (a disinfectant solution used to kill bacteria) was given to IYC in the current study, as it is not meant for oral consumption. Cultural practices are known to influence IYCF and may be potentially harmful to the health of IYC. However, these practices have been in place for many generations and are unlikely to stop altogether. Therefore, there is a need for understanding and acceptance of both Western medicine and cultural influences to ensure that the health and well-being of IYC are always prioritised. It is recommended that caregivers attending Masons Clinic in Copesville, PMB should be educated on the potential dangers of giving non-edible items to IYC. In addition, education should also focus on the benefits of continued breastfeeding until two years of age or beyond.

Study limitations

This study was conducted only at Masons Clinic in Copesville, PMB, KZN. Therefore, findings cannot be generalised for PMB or KZN. An evaluation of the completeness of each questionnaire after each interview was not conducted at the time of data collection due to time constraints and personnel constraints. This contributed to missing data for some questions.

Conclusion

The IYCF practices of caregivers at Masons Clinic, Copesville, in KZN were suboptimal. The findings indicate that there is a need to educate caregivers on the benefits of continued breastfeeding until the age of two years or beyond. The finding that some caregivers fed non-edible items to their IYC is of serious concern and poses a serious health risk to IYC. It indicates an urgent need for caregivers to be educated on the potential dangers associated with feeding non-edible items to IYC. Cultural practices continue to impact on IYCF and healthcare workers must take this into consideration when educating caregivers on IYCF.

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