

Caregivers' Interpretation of the Growth Chart and Feeding Practices of Children under Five Years: A Case of Greater Tzaneen Municipality, South Africa

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Abstract The main purpose of this study was to investigate the interpretation of the growth chart and feeding practices of caregivers of children under five years from Greater Tzaneen Municipality, South Africa. The study design was descriptive, exploratory, and quantitative with qualitative aspects. A sample of 120 caregivers with their 120 children under the age of five years was selected from six clinics in the Municipality using the multi-stage sampling method, and 30 professional nurses were conveniently selected from the same clinics. Data was collected using two questionnaires for caregivers and another for nurses. The constructs measured included demographic data, availability of the chart, the knowledge and infant feeding practices of the caregivers, anthropometric nutritional status and the caregivers' interpretation of the chart. The birth weight and length of the children were recorded from the growth chart and the current weight and length/height were also measured. Most children were taken care of by their biological mothers who also provided finances for their food. Half of the nursing staff said all categories of nurses performed growth monitoring and health promotion, and educated caregivers about the feeding of children. Contrary to what the nurses reported, only 13% of the caregivers were taught about feeding two- to five-year-old children. About 71.7% were taught about feeding children of three to 24 months, while only 23.3% were taught about exclusive breastfeeding. More than half of the caregivers were taught about the importance of the growth chart, but only a minority were taught about feeding interventions to implement when the growth curve took a normal or abnormal direction. The caregivers did not know about the frequency of growth monitoring beyond the first year of a child's life. In conclusion, the caregivers had growth charts for their children and knew their importance, but did not know how to interpret the growth curve and how to nutritionally intervene based on the curve direction. and the cut-off age for growth monitoring.

Keywords: *interpretation of growth, growth chart, growth monitoring, feeding practices, caregiver*

Cite This Article: Sibanda Martha Nyavani, Mbhenyane Xikombiso Gertrude, and Mushaphi Lindelani Fhumudzani, "Caregivers' Interpretation of the Growth Chart and Feeding Practices of Children under Five Years: A Case of Greater Tzaneen Municipality, South Africa." *Journal of Food and Nutrition Research*, vol. 4, no. 6 (2016): 369-376. doi: 10.12691/jfnr-4-6-5.

1. Introduction

A growth chart, as initiated by the United Nations Children's Fund (UNICEF), is used globally as a tool to monitor the growth of a child and is easy to use by involving caregivers in the care of their children. Health workers are expected to educate caregivers on the importance and use of this valuable resource. Growth charts have been proven to be used universally in paediatric care and that all the countries use weight-for-age as the indicator of choice, with over half relying on this indicator alone [1].

Growth monitoring, as accomplished through the use of the Road-to-Health (RTH) chart, has been adopted and used in many developing and developed countries to effectively monitor the health of its children [2]. Poor

growth in children can lead to high mortality and morbidity in early childhood, which, in turn, determines the status of a country's development [3,4]. Growth monitoring involves the regular measuring of weight and height/length of a child (and head circumference in infants and young children), and the plotting of this measurements on a growth chart. This provides a record that allows visualisation of the child's growth pattern over time [5].

Ideally, babies should be weighed on a monthly basis. However, in other instances the frequency of weighing is dictated by the immunisation schedule, the health worker's schedule, the distance to local clinics and the baby's health condition and risks [6]. In Canada, growth monitoring was recommended to be organised according to the immunisation schedule, with additional visits within the first month and also at nine months, i.e. within one or two weeks of birth, at one, two, four, six, nine, 12, 18 and

24 months, and four to six years [7]. In addition, the baby should be weighed when visiting the clinic for treatment of minor ailments, and this weight must be plotted on the growth chart for reference [8].

Growth assessment is the measurement that best defines the health and nutritional status of children, and this provides a measurement of the quality of life of the entire population. For a child to be said to have impaired growth, means that there has been a comparison of that child with a reference child of the same age and sex [9]. Regular monitoring of growth acts as an early warning sign of a possible problem and also helps and also aids early detection/diagnosis of the conditions that affect growth directly that affect growth directly [10]. Poor growth in babies, as manifested by malnutrition, is a response to limited nutrient intake and/or utilisation, and a vast number of problems are associated with this [3].

The World Health Organization (WHO), UNICEF and the United Nations Educational, Scientific and Cultural Organization (UNESCO) promote child growth monitoring as one of the ten Facts for Life. The Primary Health Care approach encourages transfer of knowledge and skills from health workers to communities and individuals in order to evoke community solutions to malnutrition and diseases in children [11].

The growth chart offers a convenient way of monitoring child health and nutritional status as well as presenting basic health data, allowing assessment of current status and trends of child growth performance [6]. The two primary uses of growth charts are (1) to make growth visible to both the health workers and mothers, and to motivate them to maintain or improve the children's nutritional status and (2) to detect growth faltering and plan and execute intervention strategies [13]. In order for growth charts to be useful as an educational and screening tool, mothers and health workers need to know how to interpret it well. The data on the chart, i.e. weight and age, must be accurate and health workers must be able to appropriately identify interventions that need to be taken for growth faltering [13].

Infancy, from birth up to 2–3 years, is characterised by rapid growth in weight and height, more than any other phase in life. Infancy is a continuation of foetal growth and is independent, in the neonatal phase, from maternal, placental and foetal factors [4]. As feeding practices during the first years of life have an important influence on the nutritional status, growth and function of the young child, maternal involvement is of prime importance since mothers are the main decision makers of what, when and how babies are fed [14].

Equipping caregivers with information regarding the care of children will, to a great extent, improve the care of children in terms of feeding [15]. A study in Gauteng, South Africa [16], found that most parents believed that growth charts were only necessary for well-baby clinics and not for consultations when it contributed towards improving the child's health.

The South African government adopted the American National Centre for Health Statistics/Centre for Disease Control (NCHS/CDC) growth chart as the primary tool for growth monitoring/assessment. This is the chart that was used at the time of data collection and all the caregivers were interviewed based on this chart. The NCHS/CDC growth chart was recommended for international use in

1977 and revised in 2000 [18]. The South African growth chart, referred to as RTH chart is a take-home, A3-sized card folded into A5 format.

The likelihood of mothers losing their RTH charts makes it difficult to monitor the growth of such children [17]. Since the RTH chart is a take-home health record, once it is lost it is difficult to duplicate as most of the information is not held at the clinic.

WHO has realised that there are some aspects of growth charts that health workers find difficult to understand or to perform, e.g. inability to accurately record the child's age on the graph, difficulty in determining and recording the birth month, incorrect weighing, inaccurate plotting of weight on a chart difficulties in understanding the growth references, difficulties in interpreting the growth curve, problems with understanding the concept of a child "at risk" and difficulty in taking effective action [6]. With all the challenges, if not well addressed, health workers may not be able to assist mothers to understand and interpret the growth curve and therefore participate in the monitoring of growth of their children [6].

Important points to consider in the interpretation of growth charts by the caregiver are the direction of the growth curve and its position. This indicates to the mothers, and health workers, the need for intervention and also provides evidence for the success or failure of the intervention strategy [8]. However, some mothers do not value the importance of their role in growth monitoring. In some instances, mothers felt that the RTH chart belonged to the clinic and would like it replaced by a baby's own notebook in the mothers' home language, which records more information on health matters and has enough space for weight recording [19]. In Lesotho, it was found that with three training sessions, Basotho mothers could distinguish adequate from poor growth of their children and could interpret the RTH charts [13].

The mode of feeding children has a strong bearing on their growth. Breastfed infants grow faster for the first three to four months as compared to formula-fed infants, with a subsequent decrease in weight as the child progresses up to the age of 12 months [10]. As mothers are the primary caregivers, they play a major role in the caring and feeding of children. Feeding practices differ between cultures and between groups within the same culture. However, a child's need for food, health care, protection and love is the same in all cultures [15].

Growth of children associated with feeding practices is dictated by maternal care practices. Care practices that affect a child's nutrient intake include adaptation of feeding to the child's characteristics (e.g. psychomotor capabilities and appetite), responsiveness of the mother to the feeding situations and appropriateness of the feeding situations [20]. Maternal care of children can only improve the feeding practices of children if the caregivers know and understand infant nutrition. This is essential for the wellbeing of the child as feeding patterns established in the first year of life may affect its health and feeding in later years. A survey done on mothers' understanding of basic infant nutrition has concluded that mothers were not well informed and had difficulties understanding infant feeding and feeding choices and therefore compromised the nutritional status of children [21].

Studies have been conducted in various parts of the world, e.g. Dominica, Australia, Lesotho, Sri Lanka and

other parts of South Africa (in the Western Cape) on the use of growth charts and their interpretation/understanding by mothers and health workers [13,19,22,23,24]. However, no studies of such nature have been done in the rural villages of Limpopo Province, South Africa, where it is proven that there is a significant prevalence of malnutrition [25].

Thus, the purpose of this study was to investigate knowledge about infant feeding and growth charts and their monitoring as well as the feeding practices in relation to growth monitoring of caregivers of children younger than five years of age in the Greater Tzaneen Municipality (GTM) of Limpopo Province, South Africa.

2. Materials and Methods

2.1. Study Design

The study was descriptive and explorative as the researcher described the interpretation of growth charts and feeding practices by caregivers of children younger than five years and also explored the influence of caregivers' knowledge about the growth of their children in relation to feeding practices. The population of this study included caregivers of children under five years who came to the six clinics to attend the well-baby clinic and those coming for the treatment of minor ailments, and the nursing staff working with RTH charts in the clinics in the GTM.

2.2. Sampling

A multi-stage sampling method was used to recruit the caregivers of children, where simple random sampling was used to select the clinics from the GTM. The caregivers were stratified through quota sampling into two groups by age of the babies, where the first group was 3–12 months and the second group was 13–60 months. Convenience sampling was used to recruit participants (child and caregiver pairs) who were the first clinic clients that came for consultation on the day of data collection and consented to participate.

The clinic nursing staff were sampled through convenience sampling, where the nurses who dealt with RTH charts found at the clinic on the day of data collection, after they had given consent, were interviewed. The research was conducted in seven clinics, of which one was a pilot site. The final sample consisted of 120 caregivers, 120 children (60 aged 3–12 months and 60 aged 13–60 months) and 30 nurses.

2.3. Data Collection

Two questionnaires were developed and validated for both the caregivers and the nurses. The caregivers' questionnaire was translated and administered in their local languages, Xitsonga or Sepedi, whereas those of nurses were administered in English. The questionnaire for the caregivers had items grouped under socio-demographic data, availability of the chart, the knowledge and infant feeding practices of the caregivers and the caregivers' interpretation of the chart. On the other hand, the questionnaire for the nurses had items grouped under socio-demographic data, the knowledge about caregivers'

infant feeding practices and the nurses' interpretation of the chart.

After the questionnaires were piloted in one clinic on 20 caregivers and four nurses, changes were effected before the study was conducted. Caregivers were seen and interviewed at the clinic when they came for consultation of their sick babies or to attend the well-baby clinic. Four photocopied charts and the children's RTH charts were checked with the caregivers in order for the caregivers to analyse the curve direction and evaluate the caregivers' interpretation in relation to feeding.

As with caregivers, the nurses were also interviewed individually and the four photocopied charts used for the caregivers were also used.

2.4. Data Analysis

A statistician was consulted for advice and guidance after the pilot study, and, after data collection, on the use of statistics. The results were analysed using the Statistical Package for Social Sciences (SPSS) version 21 and the type of statistics used for analysis was descriptive in the form of percentages.

2.5. Ethical Considerations

Before any data was collected, approval was sought from the University of Venda Ethics Committee, Provincial and District Department of Health: Limpopo Province, and the participants through signing of the consent form.

3. Results

3.1. Socio-demographic Information

Almost half of the caregivers (46.7%) were in the age group of 24 to 35 years and the least, 14.2%, were 46 years and above. The highest number of caregivers was the mothers themselves at 74.2%, followed by grandmothers at 17.5% and aunts at 4.2%. Caregivers with secondary education took the highest percentage at 65.8%, 16.7% had primary education and 9.2% had no education at all. Out of 120 caregivers, 43.3% were married, while 30.8% were single and 18.3% were living with partners while 7.6% were either divorced or widowed. See [Table 1](#) below.

Mostly, the mothers of the children themselves (63.3%) prepared food for the children, 43.3% fed them and 25% of the children fed themselves. Mothers of the children took the lead (43.3%) in the provision of finances for the children's food and almost a third (27.5%) received their income from social grants; 40.8% of families were within the 1000 to 2000ZAR (~100–200 USD) per month income bracket. Of the 30 nurses interviewed, 56.7% were professional nurses, while 26.7% were enrolled nurses and 16.7% were nursing assistants, with the majority having more than five years' experience and half of them indicated that all nursing categories are responsible for the completion and first issue of the RTH chart.

3.2. Caregivers' Knowledge about Infant Feeding Practices

The majority of the caregivers (71.7%) were taught about the feeding of a three- to 24-month-old baby and

just over half (53.3%) were taught by health workers in either hospitals or clinics. Only 23.3% of the caregivers were taught that the child should be breastfed only for up to six months. While 23.3% said that they were taught that a baby should be given food before six months, 18.3% said that they were taught to give their babies baby food after six months. However, all the nurses said caregivers are taught about feeding a three- to 24-month-old child, but only 26.7% agreed with breastfeeding only for up to six months. See Table 2 below.

Table 1. Caregivers' sociodemographic information

	n = 120	Percentage
Caregivers' ages in years		
Below 18 years	2	1.7
19-23 years	23	19.2
24-35 years	56	46.7
36-45 years	22	18.3
46 years and above	17	14.2
TOTAL	120	100
Caregiver's relationship to the child		
Mother	89	74.2
Grandmother	21	17.5
Aunt	5	4.2
Sister	2	1.7
Father	2	1.7
Child minder	1	0.8
TOTAL	120	100
The caregiver's religion		
Christian	89	74.2
Both African and Christian	17	14.2
African	14	11.7
TOTAL	120	100
The caregiver's educational levels		
Secondary	79	65.8
Primary	20	16.7
None	11	9.2
Tertiary	9	7.5
ABET	1	0.8
TOTAL	120	100
The caregivers' marital status		
Married	52	43.3
Single	37	30.8
Living with a partner	22	18.3
Divorced	5	4.2
Widowed	4	3.3
TOTAL	120	100

The minority (13.3%) of the caregivers agreed that they were taught about feeding a child of two to five years and 6.7% were taught in health facilities. With respect to the information given about feeding a child of two to five years, 8.3% of the caregivers said they were taught to give other foods in addition to starchy foods, and 6.7% said they were taught to give starchy foods. Most nurses

(86.7%) said they taught caregivers about feeding in this age group, but only 46.7% included information on giving nutritious food. When asked about the types of food that they fed the children, all of the caregivers indicated that they gave starchy foods and about a quarter gave them vegetables, while another quarter gave them protein foods.

Table 2. Caregivers' responses on education given to them about feeding a child of three to 24 months

	n = 120	Percentage
Person who taught caregivers about feeding a child of three to 24 months		
Health worker	64	53.3
Mother/ mother-in-law	15	12.5
Radio/ TV	2	1.7
Grand mother	1	0.8
Printed media	1	0.8
Baby's mother	1	0.8
Mother's friends	1	0.8
Mother's ex employer	1	0.8
Not applicable (Never taught)	34	28.3
TOTAL	120	100
Where caregivers were taught about feeding a child of three to 24 months		
Clinic	38	31.7
Hospital, general	23	19.2
At home	18	15.0
Media	3	2.5
Clinic and hospital general	3	2.5
Ex employment	1	0.8
Not applicable (Never taught)	34	28.3
TOTAL	120	100
Information given to caregivers about feeding a child of three to 24 months		
Breastfeed only for up to 6 months	28	23.3
Give baby food before 6 months	28	23.3
Give baby food after 6 months	22	18.3
Breastfeed only for less than 6 months	21	17.5
Give other foods before 6 months	19	15.8
Give other foods after 6 months	13	10.8
Give bottle/ formula feeds	8	6.7
Give the right food	2	1.7
Feed regularly	2	1.7
Breastfeed only if you are able to	1	0.8
Not applicable (Never taught)	34	28.3

3.3. Caregivers' Knowledge about Growth Monitoring

More than half (54.2%) of the caregivers indicated that they were taught about the RTH and when questioned they knew the importance of the RTH chart and used for child health issues, while 30.8% said they were only taught that they should take care of it, placing it in safe place. However, all nurses said that the caregivers are taught about its importance and use and 93.3% of the nurses cited its use as being for health issues.

When caregivers were asked about the frequency of visiting the clinic for growth monitoring in real practice, 58.3% said once per month, 29.2% said on immunisation day, 3.3% said every two months and 2.5% said they did not visit the clinic for growth monitoring because monitoring was done at the crèche. See [Table 3](#).

Table 3. Frequency of caregivers' clinic visit for growth monitoring

	n = 120	Percentage
Once per month	70	58.3
On immunization day	35	29.2
Every two months	4	3.3
Every 6 months	2	1.7
On date given to come back	2	1.7
No longer attending/ coming	2	1.7
Every 3 months	1	0.8
When I get time off work	1	0.8
Do not visit (child monitored at the crèche)	3	2.5
TOTAL	120	100

The caregivers were further probed about their knowledge in order to compare with actual practice. According to 83.3% of the caregivers, a child of zero to 12 months should visit the clinic for growth monitoring on a monthly basis and 8.3% said that they should do so only on immunisation day. The frequency of growth monitoring for a 13- to 24-month-old child was said to be monthly by 41.7% of the caregivers, while 24.2% said they did not know and the rest had other responses. See [Table 4](#) below.

Table 4. Knowledge of Caregivers About Frequency of Growth Monitoring

Frequency of growth monitoring	0–12 mos.	13–24 mos.	25–36 mos.	37–60 mos.
Monthly	83.3	41.6	20.8	19.2
Bimonthly	4.2	13.3	6.7	4.2
On immunisation	8.3	15.0	6.7	21.7
As per TCB date	-	1.7	0.8	0.8
Quarterly	-	1.7	3.3	3.3
Twice per year	-	2.5	3.3	4.2
Never/did not come	-	-	13.3	3.3
Didnot know	4.2	24.2	45.0	43.3
TOTAL	100	100	100	100

TCB: To come back.

For growth monitoring of a child of 25 to 36 months, 45% of the caregivers said they did not know about growth monitoring frequency and 43.3% did not know for children of 37 to 60 months old.

The results showed that there was a decline of knowledge about the frequency of growth monitoring as the children grew older; they only knew the frequency for a child under 12 months. Also, caregivers did not have information about the frequency as the children's ages progressed and this is evident by the fact that over 40% did not know the frequency of growth monitoring when the child grew beyond 24 months.

Similarly to the responses of caregivers, the nurses' knowledge of frequency of growth monitoring was highest for children of zero to 12 months old at 83.3%, and

declined with growing age to 40% for children of 37 to 60 months old.

When asked to interpret their own children's growth on the RTH chart, 44.2% of caretakers said their children were growing well, 20.8% gave no response as they did not have the RTH chart or their children's charts did not have a graph, 13.3% said their children were not growing well, while 10.8% did not know how to interpret their children's growth. Of the caregivers who had a growth chart and graph for their children, only 29.2% gave the correct interpretation of the charts' information.

Caregivers were asked to interpret the curve direction and gave varied responses. [Table 5](#) shows the caretakers' interpretation of the graph on the RTH by looking at the curve direction; "correct" means that the answer given was in line with the recommended response while incorrect was the opposite thereof.

Table 5. Caregivers' Interpretation of Growth According to Different Growth Curves

	n	Percentage	Researcher Interpretation
Caregivers' interpretation when the graph goes steeply upwards			
Growing well	23	19.1	Incorrect
Gaining too much weight	11	9.2	Correct
Losing weight	9	7.5	Incorrect
Not growing	2	1.7	Incorrect
Did not know	75	62.5	Incorrect
TOTAL	120	100	
Caregivers' interpretation when the graph goes along the bold line			
Growing well	47	39.1	Correct
Not growing	6	5.0	Incorrect
Losing weight	5	4.2	Incorrect
Did not know	62	51.7	Incorrect
TOTAL	120	100	
Caregivers' interpretation when the graph goes horizontal/flat			
Losing weight	32	26.7	Incorrect
Not growing	13	10.8	Correct
Growing well	10	8.3	Incorrect
Gaining too much weight	2	1.7	Incorrect
Did not know	63	52.5	Incorrect
TOTAL	120	100	
Caregivers' interpretation when the graph goes downwards			
Losing weight	37	30.8	Correct
Not growing	6	5.0	Incorrect
Growing well	4	3.3	Incorrect
Gaining too much weight	2	1.7	Incorrect
Did not know	71	59.2	Incorrect
TOTAL	120	100	

3.4. Caregivers' Knowledge About Feeding Practices in Relation to Growth Monitoring

Most of the caregivers (62.5%) said that they did not know how to intervene when the graph goes above all the lines on the RTH chart and 10.8% of caregivers responded

correctly by saying that feeding should continue as before. Almost half (51.7%) of them did not know the intervention for a child with a graph that follows the bold line. A quarter were correct to say that it would be proper to continue feeding as before while increasing food as the child grows. Almost half of the caregivers (52.5%) did not know how to intervene when the graph goes horizontal/flat, while 20.8% correctly said food quantity should be increased. About 60% of the caregivers said they did not know how to intervene when the graph went down on the RTH chart, while 21.7% of the caregivers were correct to say that food quantity had to be increased.

The nurses also gave different responses on feeding intervention when looking at the curve direction. Only three out of 36 responses were correct for a steep curve, 21 out of 32 responses for a normal curve, 29 out of 44 for a flat curve and 31 out of 56 responses for a downward curve (more than one response was given for this question).

4. Discussion

The results of this study showed that 46.7% of the caregivers were in the age group of 24 to 35 years, similar to other studies [27]. The highest number of caregivers in this study was mothers of children at 74.2%. This observation has also been confirmed by other studies [16], [28]. Caregivers with secondary education were in the majority in this study at 65.8%. The biological mothers of the children comprised 63.3% of the caregivers, and prepared food for the children, fed them and provided for their finances. Mothers were the individuals receiving social grants since they are considered primary caregivers of children in South Africa [29].

In this study, 56.7% of the 30 nurses interviewed were professional nurses, mostly with more than five years' experience. Half of the nursing staff indicated that all nursing categories were responsible for the completion and first issue of the RTH chart. According to the South African Nursing Council scope of practice, enrolled and professional nurses should conduct growth monitoring and promotion, and therefore should be able to complete and issue the RTH chart [29]. The results showed that there was confusion about the scope of practice of the various categories of nurses or that there was inappropriate delegation of duties in the clinics.

In this study, all the nurses indicated that the caregivers were taught about the use/importance of the RTH chart as confirmed in similar studies [19]. The majority of the caregivers said that they were taught about the feeding of babies of three to 24 months and this was confirmed by the nurses. However, when asked about what they feed, the caregivers focused more on children of zero to six months and less on children of three to 24 months. There was contradicting information on feeding with the three to 24 months group as the caregivers said it should be exclusive breastfeeding up to six months while also saying that the baby should be given food before six months.

This proves that although mothers are taught about feeding, they still do not have adequate information as they did not know about practising exclusive breastfeeding and could not give information about feeding beyond six months. A study reported that although breastfeeding rates are still high, at 97%, in the rural areas

of South Africa, most mothers do not practise exclusive breastfeeding and introduce other foods and drinks at about three months [30].

Regarding the feeding of children of two to five years, the majority of the caregivers (86.7%) denied ever having been taught about feeding a child of that age group, while the majority of nurses (86.7%) said that caregivers were taught. In addition, the caregivers and nurses could not agree on the content of what was taught. Some of the caregivers knew that children need to be given a variety of food while others emphasised the use of starchy food. This confirms that mothers did not know what to feed to this age group of children as they are not taught in the health service about this [17]. A recent survey in rural India concluded that improvement in growth indicators will require strengthening of health education for target populations having sub-optimal infant and child feeding practices feeding practices [31], similar to those in the GTM [31].

When the caregivers were presented with graphs indicating different growth patterns and asked to propose a nutritional intervention for such patterns, most of them did not know what the intervention should be as they failed to interpret the growth patterns. This shows that the caregivers would not know what to feed their children even when they were not growing well, as they could not recognise poor growth from a growth chart. This was contrary to other studies [22,32], where caregivers were reported to be knowledgeable about growth monitoring. The caregivers' knowledge about infant and young child feeding has been shown to be a crucial predictor for optimum child feeding [33]. These researchers and others showed that nutrition knowledge of caregivers positively predicts adequate dietary intakes of infants [3,33]. Furthermore, literature attests that the success of child growth relies on counselling of caregivers by health workers [28].

The responses in this study showed that there was a decline in the knowledge on the frequency of growth monitoring for children in age groups beyond 12 months. Both the caregivers and the nurses did not know about the frequency of growth monitoring as the children's ages progressed. Although WHO, UNICEF and UNESCO recommend that children should be weighed every month for the first three years of life [26] and also advocate for the involvement of mothers through providing families with essential child health information, this study showed that the practices of growth monitoring for the age groups beyond 12 months did not comply with recommendations.

Only 13.3% of the participating caregivers knew the right time to stop growth monitoring to be six years. About half of the caregivers (49.2%) responded that the right time to stop growth monitoring and promotion was five years. In South Africa, growth monitoring ends when the child gets the last immunisation, which is at six years according to the South African RTH chart. Some researchers recommend that growth of children should be monitored up to six years of age [7]. The confusion about stopping growth monitoring at five years clearly shows that there was poor dissemination of information as caregivers still adhered to the previous to the previous growth monitoring schedule that was meant for children up to five years. Therefore, the assumption is that the well-baby clinics were not well attended and, as such,

there was no opportunity to teach the caregivers about the two to five years age group in the well-baby clinics.

In this study, 20.8% of caregivers did not interpret their children's charts as they either did not have an RTH chart or their charts did not have graphs. The Integrated Management of Childhood Illnesses (IMCI) protocol dictates that all dots need to be joined to form a graph and all RTH charts need to have such a graph [12]. However, it was evident from this study that some nurses, though in the know, did not plot the children's weights on the charts. This implies that some caregivers were not taught about how to follow their children's growth through the graph on the RTH chart.

The way in which health workers plot a child's weight on the graph, even when done incorrectly by leaving the dots unconnected or by only joining distant dots, is not questioned by caregivers and this implies that caregivers do not have adequate knowledge regarding RTH charts.. This is done despite the IMCI manual indicating that dots need to be joined to indicate progression of growth [12].

Of those caregivers who had graphs, the majority did not know how to interpret their children's RTH charts properly and only 29.2% interpreted them correctly. The nurses cited that the major problem they encountered when doing growth monitoring at the clinics was defaulting immunisation and growth monitoring, which constituted 43.3% of the problems. Missing immunisation or growth monitoring visits could have contributed to why most caregivers did not know how to interpret the charts because the nurses indicated that education was done during well-baby clinic visits.

In the study, only a minority of mothers could interpret the graph on the RTH since 9.2% knew and responded correctly when presented with charts showing curves that were steep, normal, flat or downward sloping. Another study evaluated Latino mothers' perception of infant healthy growth [34]. It was shown that growth charts were well received, and mothers were able to plot the graphs with modest accuracy and further recommended the provision of culturally sensitive education to support healthy infant growth [34].

5. Conclusions

There was evidence that half of the caregivers were taught about the feeding of babies in the age group of three to 24 months, but only a minority was taught how to feed a child of two to five years, and exclusive breastfeeding was not emphasised.

The majority of the caregivers had growth charts, knew that they are important, had been taught about their importance, knew that they were primarily used to monitor growth and other health issues, and needed to be taken care of. However, they did not know how to use the growth chart to improve the feeding of their children, and also did not know the cut-off age of the child when growth monitoring has to end.

The majority of both the caregivers and nurses knew the frequency of growth monitoring for a child from zero to 12 months, but the rate of knowledge declined as the child grew older beyond 12 months; the knowledge was lowest for the 37–60 months age group.

The majority of caregivers did not know how to interpret the curves on their children's growth chart and therefore could not tell how the child was growing by looking at the graph. They also did not know how to intervene nutritionally for the different growth patterns, even for a child that is not growing well.

There is a need to improve educational content on growth monitoring for the caregivers in order to improve their practices on infant feeding. Focus could be placed on the importance of the growth chart in relation to feeding, frequency of growth monitoring at different ages of the child, the cut-off age, and their role in the weighing and monitoring of growth of their children.

The limitations of this study is that the nutritional intakes of the children were not measured and that it was a cross-sectional survey which only interview the caregiver once only at the clinic. Future studies should also follow-up the caregivers at home for observation and collect data more than once including the children not being brought to clinics.

In conclusion, this study showed poor knowledge and skills of caregivers in interpreting the RTH chart. In order for nurses to better educate caregivers, there is need to ensure integration of growth monitoring and nutrition for children up to six years of age in their in-service training programmes. Growth monitoring strives to improve nutrition, reduce the risk of inadequate nutrition and growth faltering, educate caregivers, produce early detection and referral for conditions manifested by growth disorders, and can be used in all settings to assess the response to interventions [35].

Acknowledgments

The authors acknowledge all the people who participated in this study, particularly the nurses in the clinics and the caregivers of children, University of Venda: Department of Nutrition, and Department of Health: Limpopo Province, South Africa.

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