CHAPTER 5

QUANTITATIVE RESEARCH STRATEGY

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"The known is finite, the unknown infinite; intellectually we stand upon an islet in the midst of an illimitable ocean of inexplicability. Our business . . . is to reclaim a little more land" (T.H.Huxley in Dane, 1990:61)(71).

5.1   INTRODUCTION

Babbie (1992:G6)(74) defines quantitative analysis as "the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect". According to Greenbaum (1988:6) (72) quantitative research consists of research conducted for the purpose of obtaining empirical evaluations of attitudes, behaviour or performance. This is mostly done to provide data with information developed from a relatively small group that is representative of a larger universe. Subsequently results can be projected to the universe from which the sample is drawn.

For this research study, quantitative research methods / techniques were required for the description and / or evaluation of:

- the biographical profile of selected families in the community,
- the nutritional status of the children in terms of:
    - anthropometry, and
    - dietary adequacy,
- the food security of selected families in the community.

The chosen measuring instruments and appropriate evaluation techniques will subsequently be discussed.

5.2   MEASURING INSTRUMENTS: SELECTION, DEVELOPMENT AND METHODOLOGY

5.2.1   BIOGRAPHICAL PROFILE

5.2.1.1 Biographic indicators

Socio - demographic information were gathered by means of a structured, pretested questionnaire. The questionnaire was compiled from the relevant literature in order to identify certain aspects pertaining to the research group; specifically those aspects that might influence the nutritional status of the members of a community. Questions pertaining to demographic information, environmental and health factors were included. (See Addendum A.)

5.2.1.2 Methodology as implemented for this research study

The structured questionnaire (Addendum A) was used during an individual interview with the mother /

caregiver of each child in the study group. The data attained from the questionnaire were coded, processed and analysed by means of descriptive statistics.

5.2.2   NUTRITIONAL STATUS

When different nutritional assessment methods are combined, a nutritional profile can be compiled of either an individual or a population (18). Nutritional assessment methods can be classified in five categories, namely anthropometric, biochemical, clinical, dietary and functional methods (1, 18, 29). For the purpose of this research study only two of these methods were incorporated into the quantitative methodology, namely anthropometric and dietary methods (see Table 20).

TABLE 20 : NUTRITIONAL ASSESSMENT METHODS

CATEGORY	MEASURES CHOSEN	JUSTIFICATION
1. **ANTHROPOMETRIC METHODS** Measurement of the physical dimensions and gross body composition	- height - weight - head circumference	These 3 measures are the most sensitive indicators for infants and children
2. **DIETARY METHODS** Assessment of nutrient intakes including quantity, food supply, practices, preparation and storage	- 24-hour dietary recall - analysis of dietary intakes via a nutrient analysis software programme	This method is relatively easy to implement and affordable while it produces high quality data. Nutritional analysis via a computer programme is easily achieved

(Adapted from 1 and 29)

5.2.2.1 Anthropometry

Lee & Nieman (1993:122)(29) define anthropometry as "the measurement of body size, weight and proportions". These are sensitive indicators of health development and growth in infants and children (1, 6, 29).

5.2.2.1.1   Anthropometric indicators and applicable methodology

Weight One of the most important parameters used in nutritional assessment is body weight, since it can be used effectively to predict energy intake/expenditure and body composition. Infants should be weighed undressed and children should be weighed with minimal clothing, using an accurate calibrated scale, eg electronic or pan-type balance-beam scale. Any cushion or diaper should be in place before the zero adjustments are made and the child should be placed in the centre of the weighing surface. Body weight should be measured to the nearest 10g for infants and 100g for children (6, 29).

Height or length The measurement of length or height is important for use in parameters such as height-for-weight, weight divided by height, creatinine-height-index and estimations of the basal

energy expenditure (29). Length (also known as recumbent length) is generally used for children less than 24 months of age or for children between 24 and 36 months who cannot stand without assistance (1, 18, 29). Normally after the age of three years, height (also known as stature) is measured in a standing position. The NCHS reference data for persons birth to 36 months are based on recumbent length, while those for 2 to 18 years are based on stature (6, 1, 29). The measurement of length for infants require a special length-measuring device where the child lies on his/her back on a backboard, with the head against a stationary headboard while the moveable footboard is adjusted to press firmly against the foot soles. The zero end is at the edge of the headboard and allow the length to be read from the footboard. The length is recorded to the nearest 0.1cm (1, 29).

Head circumference Measurements of the circumference of the head is important to detect abnormalities of the head and of brain growth. This is especially important as brain growth peaks during the first year of life, but is completed after 36 months. Therefore head circumference should be measured routinely on infants and young children up to the age of 36 months (6, 29). An insertion tape proves the best positioning and fixation for measuring the cranium - just above the eyebrows, the ears and around the back of the head. Objects such as pins or ribbons should be removed from the hair. The tape should be pulled snug to compress the hair and the measurement is read to the nearest 0.1cm (1, 29).

The ideal with any anthropometric measurement on infants and young children is to follow the technique decided on uniformly each time the infant/child is measured and to record regular measurements in order to assess trends rather than evaluating only individual measurements (6,29).

5.2.2.1.2   Standards for assessment of anthropometric measurements

Standards for assessing these parameters are presented in the form of centile charts or growth charts that express the range of normal values for age from birth to 18 years for males and females. The values on which these growth charts are based are the NCHS centiles which are most widely used (1, 6, 18, 29). Although these values are based on those of normal North American children, it is generally accepted that these values represent international references standards, and therefore growth charts used in South Africa reflect the NCHS centiles (6).

Kibel & Wagstaff (1995)(6) describe these growth charts as having a bell-shaped normal distribution curve that is represented graphically over a spectrum of ages. Two standard deviations above the mean include all but 5% of the "normal" values and are represented by the 95th and 5th centiles. Any value falling outside either limit is likely to be abnormal (6). A centile is a sequence of values under which that percentage of a normal population falls. Seven percentile curves are presented on the growth chart : 5, 10, 25, 50, 75, 90, 95 (29).

Charts have been developed for both males and females for two age intervals: birth to 36 months, and two to 18 years. For the charts for birth to 36 months percentiles are provided for body weight for age, length for age , body weight for length and head circumference for age (recumbent length is used). The charts for two to 18 years provide centile curves for body weight for age, and stature for age (stature is used)(29).

5.2.2.1.3 Evaluation of anthropometric data

Weight-for-age This measurement reflects the immediate nutritional status of the infant / small child but is a poor indicator of general growth in the older child. One weight value indicates whether a child's weight falls within the normal range. The 5th percentile is used as a cut-off point below which under nutrition is diagnosed. Of all the indicators of nutritional status, weight is considered to be the most sensitive and therefore reflects acute and chronic changes. A low weight-for-age indicates altered body composition for example low serum albumin and increased total body water(6). The weights of infants weighed monthly are valuable indicators of growth in this period of rapid growth, whereas the older child gains weight at a slower rate and also less regularly. In the older child, weight gain may wrongly be ascribed to physical growth where in actual fact it may really only indicate an increase in body fat (6).

Height-for-age Deviations in height become obvious more slowly than that of weight. Reduced values indicate a chronic or longstanding problem such as malnutrition, other chronic diseases as well as chronic growth faltering, also known as stunting (1, 6). Failure to thrive can also be identified with height-for-age values < 5th percentile (1). Contrary to weight, height is a valuable growth indicator in the older child. There is a slow, linear increase in height during childhood with a growth spurt occurring in late childhood and adolescence (6).

Weight-for-height This measurement can be used when age is unknown or uncertain. This indicator evaluates the proportions of the body and it may confirm thinness or fatness. Normal weight-for-height values indicate either normal or stunted growth, with the latter indicating chronic growth failure. A low weight-for-height indicates wasting. The weight-to-height ratio may be an useful indicator of acute malnutrition in the older child (6).

Head circumference A measurement below the fifth centile (microcephaly) often reflects a cerebral insult that occurred prenatally or in infancy. It may also be due to general growth failure especially if the other parameters are also below the lowest centile. The opposite is a large head circumference above the 95th centile (macrocephaly). This is usually not due to growth abnormalities, but rather the abnormal accumulation of cerebrospinal fluid. Only rarely does macrocephaly occur as a result of macrosomia or excessive physical growth of the whole body (6).

5.2.2.1.4   Methodology as implemented for this research study

For each respondent a range of weight, length and head circumference data were obtained during the individual interview and recorded on the structured data record sheet. (See Addendum A.) The birth-measurements were collected either from the mother or from the growth chart. The previous information (after birth) as recorded on previous visits to the clinic was obtained from the growth chart. For each visit the date and age of the child were also recorded.

Weight was determined with an electronic Massakot scale. The mother stood on the scale, after which it was zeroed. The undressed baby was handed to her and the weight recorded. A table model measuring device, with a stationary headboard and a moveable footboard that are perpendicular to the backboard, was used to determine **recumbent length** of the children while lying down. The **head circumference** was measured with a flexible, non-stretchable measuring tape.

The data processing was done by the researcher. For each respondent a history of anthropometry was compiled. The birth information served as the starting point of the history and the current measurements (at the time of the research) served as the end point of the history. For each measurement the age of the child was computed in weeks of age, and the relevant percentile was read from the charts and recorded per age.

5.2.2.2 Dietary assessment

Lee & Nieman (1993:50) (29) define assessment of dietary status as the "consideration of the types and amounts of foods consumed as well as intake of the nutrients and other components contained in foods. When food consumption data are combined with information on the composition of food, estimates may be made of the intake of particular nutrients and other food components".

5.2.2.2.1   Diet measuring techniques

Various methods exist for the collection of food intake data, although no method can be singled out as being the best (29, 82). Each of the existing methods have strengths and weaknesses which should be considered when choosing a method to use (14, 29). The purpose or aim of the research should be well defined and will consequently determine the most appropriate techniques (82). Although dietary intake data for individuals are often criticized for accuracy, such accuracy is often not essential to draw valid conclusions on the universal relationship of diet and health. Broad rankings can also be achieved in terms of intake (29). There are mainly three purposes for determining individual dietary intakes:

☞   to compare average nutrient intakes of different groups,

☞   to rank individuals within a group, and

☞ to assess an individual's usual intake.

Lee & Nieman (1993:51)(29) categorise data collection methods for individuals as follows:

☞ **quantitative daily consumption methods:** measuring the nature and quantity of individual foods consumed in a defined period of time, and

☞ **semi-quantitative food frequency methods:** measuring the patterns of food use and implied nutrient intake across longer and often less precisely defined periods.

Five techniques are available to determine individual food intakes. They are the:

- 24-hour recall,
- food record or diary,
- food frequency questionnaire,
- diet history, and
- duplicate food collections.

For the purpose of this research study the 24-hour recall (i.e. a quantitative daily consumption method) was chosen as the most appropriate instrument for measuring the quantity of individual foods consumed in a defined period of time (see Table 21).

TABLE 21 : DESCRIPTION OF THE 24-HOUR RECALL METHOD

TECHNIQUE AND DESCRIPTION	STRENGTHS	WEAKNESSES	APPLICABILITY
24-hour Recall recall in detail all the food and drink intake during a period of time in the past ; assist with memory of items consumed and estimating portion sizes	◆ Requires less than 20 minutes to administer ◆ Relatively inexpensive ◆ Can provide detailed information on food ◆ Only short-term memory required ◆ Low respondent burden ◆ Probability sampling possible ◆ Can be used to estimate nutrient intakes of groups ◆ More objective than dietary history ◆ Does not alter usual diet ◆ Give qualitative rather than quantitative data ◆ Validity increases when used with another technique ◆ Can be used with illiterate respondents ◆ Usually no problems with cooperation of subjects	◆ Seldom representative of usual intake ◆ Under / over-reporting sometimes occurs ◆ Information can be withheld or altered ◆ Omissions of sauces, dressings and beverages can lead to low estimates of energy intake ◆ Inappropriate for those with irregular eating habits when determining usual food intake	◆ Best choice due to time constraints ◆ Involve the respondent for the shortest possible time ◆ Small budget required ◆ Personal contact ensures high quality information ◆ For children <8yr data are best obtained from the person preparing meals (the mother / caregiver) ◆ Easy to implement in a community where the literacy level is unknown ◆ Could use the previous day's recall or a recall of usual intake ◆ Useful to compare intakes from the different age groups involved ◆ Good validity to determine average group intakes

(Adapted from 14, 18, 29, 82, 83)

5.2.2.2.2   Evaluation of food intake data

Gathered information is usually evaluated by comparing it to some standard. Various methods exist to evaluate the nutritional adequacy of the food intake of individuals or groups.

Food group method This method is used to make a less exact evaluation of the adequacy of the diet. It is the quickest and most elementary method, but also most inaccurate. The amount of servings consumed from each of the food groups for the intake period is determined and compared to the recommended amount of servings (83). This method is impractical when no standard portion sizes are available, eg for babies. This method becomes restrictive when too many mixed items or unfamiliar cultural foods that do not fit into a food group, are eaten (14, 18, 83).

Nutrient analysis This method is used when more detailed and accurate calculations of nutrients are desired. Either food composition tables or computer software with nutrient data bases are used. The nutrient calculations are compared to the RDA values or WHO dietary standards for the reference person of the same gender and age category (14, 18, 83). Nutrient requirements vary considerably among individuals, therefore the RDA's include a safety margin and are set high to meet the needs of nearly all healthy people. This implicates that the RDA'S are probably higher than the nutrient needs of the average individual (except energy). In order to prevent overestimation of inadequate nutrient intakes, researchers often use a fixed cutoff point, such as two-thirds (67%) or three-fourths (75%) of the RDA in determining inadequate nutrient intake for specific nutrients (14, 29, 83). The FAO-WHO Recommended Intakes of Nutrients is probably a better choice of standard to use as it is intended for use in developing countries like South Africa. The recommended levels of nutrients tend to be lower than the RDA's (84).

5.2.2.2.3   Methodology as implemented for this research study

During each individual interview with the child's mother / caregiver a 24-hour recall of usual food intake was done for the child. A structured format was used for this purpose. (See Addendum A.) Preparation methods and household portion sizes were noted as completely as possible. Visual aids were used to aid in the process of recall to ensure the accuracy of the data. (See Addendum F.)

The coding of the data was done by the researcher to ensure consistency (29). The household portion sizes were converted to weights with the aid of the MRC Food Quantities Manual (1991)(85). Standard conversions and food codes were used throughout. (See Addendum G.) The recorded food intake was analyzed by means of a software program (Foodfinder)(129). The WHO dietary standards as well as the RDA's were used to evaluate dietary intakes.

5.2.2.3 Food security

Food insecurity usually leads to hunger and malnutrition (see Chapter 3). Childhood hunger has the most

detrimental effects on the health profile of the young child. In 1989 the AIN identified hunger and food security as being the most important indicators of an individual's nutritional status (42). In South Africa there is a need for the measurement of these phenomena in order to be able to address the problem sufficiently in future nutrition intervention programmes.

5.2.2.3.1   Evaluation of hunger

For the purpose of this study the Radimer/Cornell Measures of Hunger and Food Insecurity were used. According to Kendall et al (1995:2794)(42) Radimer identified two dimensions from her research on hunger. The narrow dimension of hunger refers to an insufficient intake of food and going without food, resulting in a physical sensation of hunger pangs, i.e. on the individual level. The broader dimension of hunger involves problems with household food supply, quality of diets, feelings about the situation and what has been done to maintain household food supplies; thus food insecurity (42, 48).

5.2.2.3.2   Development of the Hunger Scale

Conceptually the two dimensions of hunger each consists of four major components, concerning quantitative and qualitative aspects of the food available / consumed, and the psychological and social components experienced by households or individuals:

☞   **household hunger**
-    food depletion (running out of one's usual food supply)
-    food unsuitability (not being able to buy the quality and kinds of foods considered appropriate)
-    food anxiety (uncertainty about whether one's food supply would last)
-    food acquisition (whether household food is acquired in socially acceptable ways, such as with income or food stamps but not with charity)

☞   **individual hunger**
-    intake insufficiency (a problem of intake quantity)
-    diet inadequacy (a problem of intake quality)
-    disrupted eating patterns (not eating the socially prescribed three meals a day)
-    feeling deprived (without choice about eating this way)(see Table 22) (48).

TABLE 22 : DIMENSIONS AND COMPONENTS OF A CONCEPTUAL DEFINITION OF HUNGER (48)

COMPONENT	DIMENSION	
	HOUSEHOLD	INDIVIDUAL
Quantity	Food depletion	Insufficient intake
Quality	Unsuitable food	Inadequate diet
Psychological	Food anxiety	Feeling deprived, lack of choice
Social	Unacceptable means of food acquisition	Disrupted eating pattern

Radimer (1990:1546)(48) designed survey items to measure both household and individual hunger. These items had been taken directly from the words of women interviewed in an in-depth qualitative study, and therefore were considered to have face validity. The content and construct validity were also assessed. After factor analysis and assessment of internal consistency of the items within measures, food insecurity measures were developed that included four items directed at the household, four directed at adults and four directed at children. The reliability of the scale was assessed with a coefficient alpha and the correlation of the item with the scale. The former should be at least 0.90 for applied research and the latter should be at least 0.50. The items selected for each scale are listed in Table 23. The reliability was 0.91 for the household hunger scale, 0.92 for the women's hunger scale, and 0.89 for the children's hunger scale. All item-to-scale correlations were >0.5 (1990:1546)(48).

TABLE 23 : ITEMS TAKEN UP IN RADIMER'S HUNGER SCALES (60)

HUNGER SCALES
HOUSEHOLD HUNGER
1. Do you worry whether your food will run out before you get money to buy more?
2. The food that I bought just didn't last, and I didn't have money to get more.
3. I ran out of the foods that I needed to put together a meal and I didn't have money to get more food.
4. I worry about where the next day's food is going to come from.
WOMEN'S HUNGER
1. I can't afford to eat the way I should.
2. Can you afford to eat properly?
3. How often are you hungry, but you don't eat because you can't afford enough food?
4. Do you eat less than you think you should because you don't have enough money for food?
CHILDREN'S HUNGER
1. I cannot give my child(ren) a balanced meal because I can't afford that.
2. I cannot afford to feed my child(ren) the way I think I should.
3. My child(ren) is/are not eating enough because I just can't afford enough food.
4. I know my child(ren) is/are hungry sometimes, but I just can't afford more food.

Radimer (1990:1547)(48) suggested the following modifications to improve the scales for future implementation:

☞ use three response categories "never, sometimes, often" for questions and " not true, sometimes true, often true" for statements, rather than the five used in their research,

☞ respondents indicated that statements were easier to understand than questions. Thus transforming items phrased as questions into statements may improve them,

☞ the issue of food quality at household level was not addressed directly. A statement such as " I can't afford to buy the foods that I think I should to feed my household", based on

one of the coping tactics, would be a worthwhile addition to the household scale,

☞ the "negative loading" of some items caused a problem of double negatives, for example replying "never" to "How often would you say you don't eat balanced meals". Using items in a statement format and a response choice of "not true" rather than "never" would minimize this problem,

☞ frequency distributions of scale scores are probably the easiest and most useful forms of data. Also monitor each component separately. There is no objective guideline for determining what scale score to equate with hunger. Radimer (1990:1548)(48) recommends to use any scale score above the minimum value (i.e. any score above a consistent "never" or "not true" response) as indicative of hunger (48). These changes were made to the hungerscale (see Table 24).

TABLE 24 : RADIMER'S MODIFIED HUNGER SCALE

A.	HOUSEHOLD HUNGER	NOT TRUE	SOMETIMES TRUE	OFTEN TRUE
1.	I am worried about the family's food running out before I get money to buy more.			
2.	The food that I bought just didn't last, and I didn't have money to get more.			
3.	I ran out of foods that I needed to put together a meal and I didn't have money to get more food.			
4.	I worry about where the next day's food is going to come from.			
5.	I can't afford to buy the foods that I think I should to feed my household.			
B.	**WOMEN'S HUNGER**			
1.	I can't afford to eat the way I should.			
2.	I can afford it to eat properly.			
3.	I am hungry very often, but I don't eat because I can't afford enough food.			
4.	I eat less than I think I should, because I don't have enough money for food.			
C.	**CHILDREN'S HUNGER**			
1.	I cannot give my child(ren) a balanced meal because I can't afford that.			
2.	I cannot afford to feed my child(ren) the way I think I should.			
3.	My child(ren) is/are not eating enough because I just can't afford enough food.			
4.	I know my child(ren) is/are hungry sometimes, but I just can't afford more food.			

(Compiled from 42, 48)

5.2.2.3.3 Methodology as implemented for this research study

The adapted scale was pre-tested in a pilot study in the Hammanskraal community at the Temba clinic. Some problems relating to this specific cultural group were experienced in the pilot study and the following adaptions were made(according to Radimer's suggestions):

☞ Statements were poorly understood in English or even in the translated form in the respondent's mother language. The statements were thus all changed back into question format.

☞ The response "often" was not well understood, and could not be explained well enough. This was changed to "most times" thus indicating that this situation happens three or more times a week.

The final draft of the hunger scale as implemented in this research study can be found in Addendum A. The hunger scale questionnaire (Addendum A) was used to evaluate the food security of the respondents. Three response categories were used, namely never (indicating that this situation never happens, not even once), sometimes (indicating that this situation happens 1-2 times a week) and most times (indicating that this situation happens 3 or more times a week).

5.2.3 PILOT STUDY

A pilot study was done during May 1995. Two postgraduate students in Dietetics did the pilot study after having been trained on the quantitative data collection techniques. (See Addendum C.) The two field workers that were to be used for the actual research study worked with the two students for the benefit of their own training and to act as translators for the students. The researcher also used the two field workers to establish if the general level of difficulty as well as the comprehensibility of the questions in the measuring instrument were suitable to use for the group. During July and August(1995) the questionnaires and information attained during the pilot study were analysed and incorporated in the questionnaires to be used in the final study.

5.3 VALIDITY AND RELIABILITY OF MEASURING INSTRUMENTS

Reliability and validity are central issues in all scientific measurements. Perfect reliability and validity are the ideals to strive for, but virtually impossible to achieve. Reliability deals with the dependability and consistency of an indicator while validity is concerned with the actual meaning of an indicator (73)(see Table 25).

TABLE 25: SUMMARY OF MEASUREMENT RELIABILITY AND VALIDITY TYPES (73)

RELIABILITY It is a dependable measure	VALIDITY It is a true measure
Stability reliability (over time)	Face validity : in the judgement of others
Representative reliability (across subgroups)	Content validity : captures the entire meaning
Equivalence reliability (across indicators)	Criterion validity : agrees with an external source ✦ Concurrent validity : agrees with a pre-existing measure ✦ Predictive validity : agrees with future behaviour
	Construct validity : multiple indicators are consistent ✦ Convergent validity : alike ones are similar ✦ Discriminant validity : different ones differ

5.3.1   RELIABILITY

Reliability or reproducibility may be defined as "the ability of a method to produce the same estimate on two or more different occasions, assuming that nothing has changed in the interim" (29). Reliability is therefore concerned with whether a method is capable of providing the same answer repeatedly when applied to the same object, and does not indicate the correctness of the answer (29, 73, 74). According to Neuman (1997:138)(73) reliability means that the information provided by measuring instruments does not vary because of characteristics of the instrument itself. But it is also true that a method cannot give a correct answer every time unless it gives approximately the same answer each time. Reliability and validity therefore complement each other (29). Three types of reliability need to be considered.

Stability reliability concerns comparisons / reliability over time. It refers to the consistency of measures on repeated applications in different time periods. The test-retest method is used for pretesting instruments. With observations, numerous observations may be made, but with instruments such as questionnaires or interviews, only two are made, but always to the same group of people. With high stability reliability you will get the same results each time (73, 74). This was not tested.

Representative reliability is reliability across subpopulations or groups of people. An instrument will have high representative reliability if it yields the same result for a construct when applied to different subpopulations like different races, ethnic groups, age groups, etc. A subpopulation analysis determines this type of reliability. The indicator must be compared over different subpopulations and independent knowledge about the populations is used to verify the outcome (73). This type of reliability was not applicable for this research study.

Equivalence reliability applies when researchers use multiple instruments for one construct. Equivalence involves arriving at consistent results from two parallel measurements used with the same individuals at approximately the same time. A reliable measure will yield the same result with all instruments (73). There are two methods to examine equivalence reliability:

-        The **split-half method** involves dividing the same test randomly in two halves and determining

whether both halves give the same results. The correlation between the scores is used to estimate the reliability that would result from a full length test. Special statistical measures can also determine this type of reliability (e.g., Cronbach's alpha, Kuder-Richardson technique) (73, 74). This type of reliability was not applicable in this research study.

- **Intercoder / interrater reliability** arises when there are several observers or raters or coders of information. A measure is reliable when these observers agree with each other. This can be tested by having several coders measure the exact same thing, then comparing the measures. With high reliability, they would observe or code the same (73, 74). Since two field workers / interviewers were used for the two research sites, both were involved in the pretesting and training in order to establish that both use the same methodologies and interview techniques. The researcher was involved continuously in the process of training the interviewers to improve this type of reliability. This was not tested.

Perfect reliability is difficult to achieve (73), but four principles could be followed to increase the reliability of measures, namely:

- Clearly conceptualize all constructs: higher reliability is achieved when a single construct is measured. This requires developing clear, unambiguous theoretical definitions.

- Increase the level of measurement: indicators at higher more precise levels are likely to be more reliable. The more specific the information required, the less likely it is that anything other than the construct would be measured.

- Use multiple indicators of a variable: two or more indicators of the same construct are better than one. This allows researchers to take measurements from a wider range of content of a conceptual definition and it tend to give stability, ruling out systematic errors.

- Use pilot studies, pretests, and replication: trying out one or more drafts / versions of the measure before applying the final version in the actual research situation. This extends to replicating the measures other researchers have used. Building on previous measures by adding new indicators can only improve the quality of the measure over time (73).

In this research study the following measures, based on the fore-mentioned principles, were implemented to improve the stability and intercoder / interrater reliability of the measures used:

- clear, well defined conceptual definitions were used (refer to 4.3.2 in Chapter 4),
- specific and standardized measuring instruments for anthropometric measurements as well as for the hunger scale evaluations were used (refer to 4.4.5.2 and 4.4.4 in Chapter 4, 5.2.2.1 and 5.2.2.3 in Chapter 5),
- all the measuring instruments were pretested for understandability, applicability and clarity (refer to 5.2.3 in Chapter 5),

- a pilot study was launched to refine the instruments for the quantitative methodology (biographic questionnaire, anthropometric data sheet and measurements, 24h-recall of food intake, hunger scale) (refer to 5.2.3 in Chapter 5)

- each of the individual interview instruments were tested twice before the actual research study took place — once in the pilot study and once with the training session (refer to 5.2.3 in Chapter 5),

- the physical measurement techniques were practised to ensure a consistent and reliable application (refer to 5.2.3 in Chapter 5),

- multiple indicators were introduced for evaluating the nutritional status by means of the 24-hour recall dietary analysis and the anthropometric evaluations (refer to 4.4.5 in Chapter 4 and 5.2.2 in Chapter 5),

- only one specific interviewer from the same ethnic group, who was living in the same area, was used per research area together with the researcher in order to achieve a high level of confidence with the respondents,

- an interviewer was exclusively used per clinic, with no contact whatsoever between the interviewers. Data were thus more reliable since there was less chance for misinterpretations and prejudice,

- confidentiality was ensured by means of a formal consent form (refer to Addendum A),

- the researcher never conveyed her own opinion, attitudes or beliefs to the respondents or to the interviewers,

- leading questions were avoided as far as possible (73, 74, 86).

5.3.2 VALIDITY

Validity can be defined as "the ability of an instrument to measure what it is intended to measure" (29). Validity is concerned with what the test measures and how well it is measured. Data are valid when the correctness can be confirmed (6, 29, 74). The term validity has multiple uses which need to be distinguished from one another.

5.3.2.1 Nonmeasurement validity

External validity concerns the generalisation of research findings to the defined population and is used primarily in experimental research. High external validity means that the results can be generalized to many situations and many groups of people (73, 86). Results obtained from a representative sample can only be projected to the universe from which the sample was drawn. To ensure that external validity is achieved, random sampling is applied during the sampling phase. Additionally measurements are repeated several times in different situations (72, 86, 87). For the purpose of this research study these types of measures were unpractical and external validity could thus not be claimed for.

Internal validity concerns the internal design of the research study and means that no errors are present. It is mainly used in experimental research where errors might occur despite attempts to institute controls to prevent them (73). Internal validity was also not applicable in this research study.

Inferential validity in a study means that the correct statistical procedure is chosen and its assumptions are fully met. Misuse of a statistical procedure, even if the computation is correct, means invalid results. For high statistical validity, the major statistical assumptions should not be violated (73).

In this research study the following measures were implemented to improve the inferential validity:

- descriptive statistical procedures were use to evaluate the data and to describe the results. Descriptive statistics included the determination of frequencies, means, standard deviations and ranges,
- inferential statistics for the comparison of the data (the Student t-test, Chi-square and Mann-Whitney u-test)(P< 0.05),
- guidance by a qualified statistician.

5.3.2.2 Measurement validity

Measurement validity usually refers to a particular purpose or definition and will therefore be unique in each research situation in order to obtain valid data. It refers to how well the conceptual and operational definitions integrate with each other (73). For high measurement validity it is important that all the concepts should be defined and explained logically and systematically for each research theme. There should be no misconceptions or misinterpretations concerning them. Any research study should thus be based on a conceptual framework constructed from a sound theoretical background (73, 86). Four types of measurement validity are identified (see Table 25).

Face validity is the easiest and most basic type of validity to achieve. According to Neuman (1997:142)(73) it is a judgement by the scientific community that the indicator really measures the construct, and that the indicators that are measured really are representative of the construct. "On the face of it, does the definition and method of measurement fit?" It is thus based on the subjective evaluation of the researcher (73).

Content validity refers to the degree to which a measure covers the range of meanings included within the concept. Measures should represent all the ideas identified in the defined concept (73, 74).

Criterion validity uses a standard or criterion that is known to indicate a construct accurately. The purpose being to use a measure to estimate some important form of behaviour that is external to the instrument itself (73, 74, 86). There are two subtypes of criterion validity:

- **Concurrent validity** for which an measure must be associated with a pre-existing measure that is judged to be valid. The two measures may not be perfectly associated, but if they measure the same construct, they would logically yield similar results (73, 86). Concurrent validity was not measured in this research study.

- **Predictive validity** is used to estimate success or future behaviour from the results of a present measurement. The criterion which is employed to determine whether the measurement is valid is situated in the future (73, 86). Predictive validity was not applicable in this research study.

Construct validity is for measures with multiple indicators. It refers to the accuracy with which the constructs are measured. Does the items in the scale or questionnaire therefore measure the construct which the items are supposed to represent? (73, 86). The following two types are identified:

- **Convergent validity** applies when a few measures converge or are associated with one another. The various measures of the same construct operate in similar ways. Convergent validity was not measured in this research study.

- **Discriminant validity** or divergent validity means that indicators can converge or hang together, but can also diverge or be negatively associated with opposing constructs at the same time (73). This type of validity was not applicable for this research study.

In this research study the following measures were implemented to improve the non-measurement and measurement validity of the measures used:

- a thorough review of literature concerning the causes and effects of malnutrition, the feeding practices and nutritional status of infants and small children, was done (refer to Chapter 2 and 3),
- concepts were defined explicitly in terms of their meaning for this research study in order to prevent any misinterpretations (refer to 4.3.2 in Chapter 4),
- all the measurements used, as well as their content, were evaluated and approved by specialists in the field of nutrition,
- instruments were chosen to incorporate each applicable aspect of each concept for this study group (nutritional status, feeding practices, nutrition knowledge and attitudes)(refer to Chapter 5),
- the two interviewers evaluated the measuring instruments with reference to the level of difficulty and the understandability (refer to 5.2.3 in Chapter 5),
- a standardized hunger scale (48) was used for each individual respondent,
- nutritional status was evaluated by means of more than one accepted measuring instrument (dietary intake and anthropometry). Different indicators were also used for anthropometry (weight, stature and head circumference)(73, 86).

CHAPTER 6

QUALITATIVE RESEARCH STRATEGY

CHAPTER 6   QUALITATIVE RESEARCH STRATEGY

"Content analysis remains an underutilised research method with great potential for studying beliefs, organizations, attitudes, and human relations. The limited application and development of content analysis is due more to unfamiliarity with the method and to its historic isolation from mainstream social science than to its inherent limitations" (Woodrum in Neuman 1997: 274)(73).

6.1   INTRODUCTION

Babbie (1992:G6)(74) defines qualitative analysis as "the nonnumerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships". The purpose of any qualitative research action is to produce findings. The data collection as such, is not the main aim. It rather is the culmination of activities, including analysis, interpretation and the presentation of findings. The challenge of qualitative research lies in the following:

☞   making sense of the masses of data,

☞   reducing the volume of information,

☞   identifying significant patterns,

☞   constructing a framework for communicating the essence of what the data reveal (88).

According to Greenbaum (1988:6)(72) qualitative research is characterized by the absence of empirical measurements with the focus on more subjective evaluations. It is implemented with smaller samples since it is not intended to be projectable to a larger universe, and as these interviews tend to be longer, smaller groups are less expensive. For this research study subjective evaluations were required for the description of:

☞   the feeding practices implemented by the mothers/caregivers of the children,

☞   the nutrition knowledge of the mothers/caregivers of the children, and

☞   the attitudes of the mothers/caregivers of the children towards nutrition.

The chosen qualitative methodology and appropriate analysis techniques will subsequently be discussed.

6.2   MEASURING INSTRUMENTS: SELECTION, DEVELOPMENT AND METHODOLOGY

6.2.1   SELECTION

In the qualitative research domain there are a number of data collection strategies, some of which include ethnography, life history, case studies, focus groups, motivation research, in-depth interviews, participant observation, field research, naturalistic studies, phenomenological studies, descriptive studies, symbolic interactionism studies, interpretive research, action research, narrative research, etc (72, 75). An

appropriate method should be chosen to suit the research aim, for example individual in-depth interviews for addressing questions on individual matters; participant observation for exploring processes and behaviour occurring in a certain setting; focus groups for addressing questions regarding group behaviour, etc. The method chosen should also be a culturally and developmentally appropriate communication tool (75). A graphic overview of all the qualitative research types is presented in Figure 8 (89).
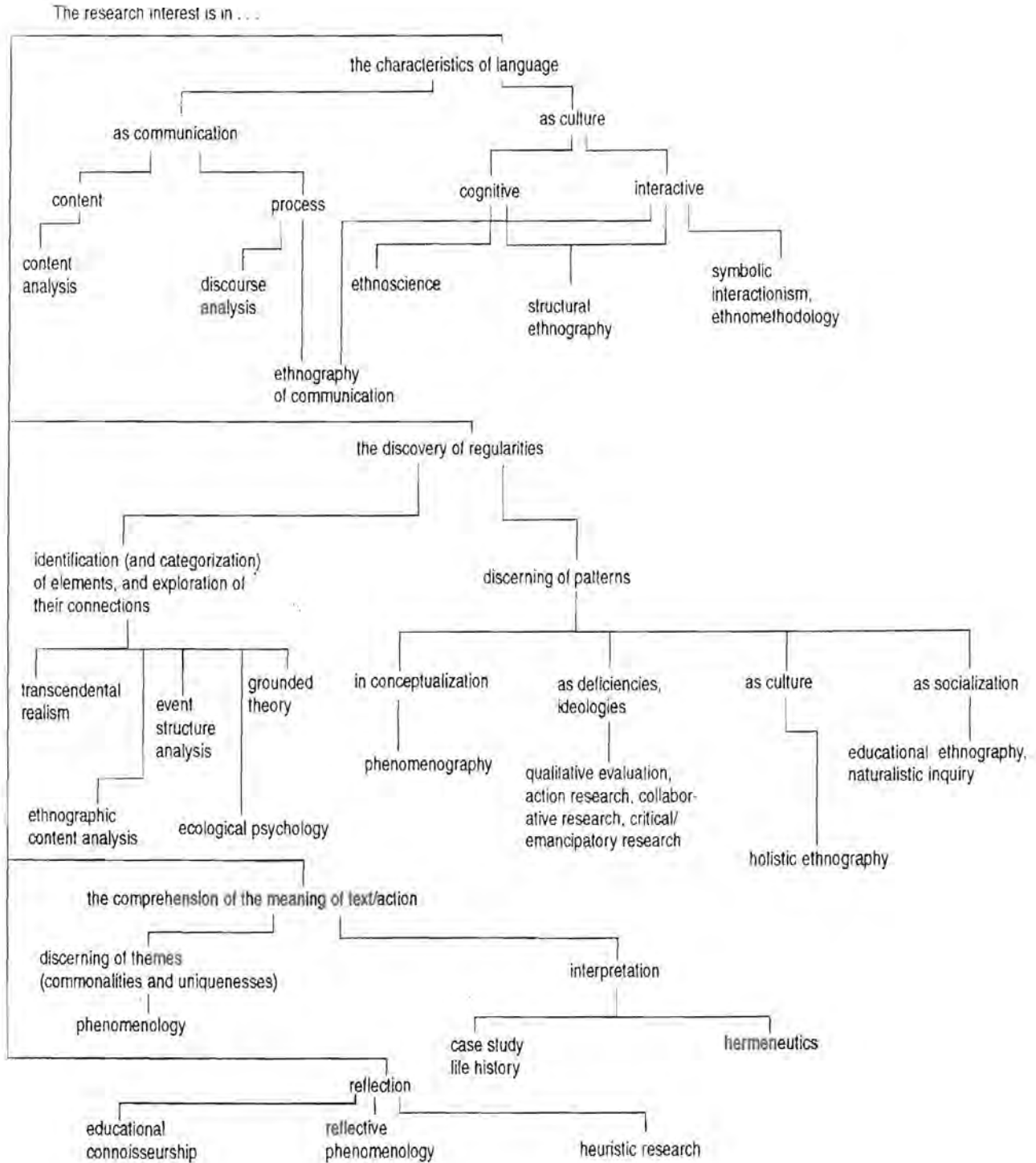
FIGURE 8 : GRAPHIC OVERVIEW OF QUALITATIVE RESEARCH TYPES (89)

The research interest (within the given nutrition context) lied in the discovery of regularities and the identification (and categorization) of elements, and the exploration of their connections. Ethnographic content analysis and grounded theory seemed to be the most appropriate of the five techniques mentioned (see Figure 8). The grounded theory approach is a method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon. It is exclusively concerned with the generation rather than the testing of a theory, and the research is used to develop theory systematically. The research begins with an area of study and what is relevant to that area is allowed to emerge (90). However, for this research study ethnographic content analysis was the more suitable approach for analysis due to the focus group technique used for the collection of data and the development of analysis categories from a science-based background (80, 89).

For this research study group participation (focus groups) was favoured because nutritional practices, knowledge and attitudes are sensitive issues. Sharing their ideas and knowledge as group members could be more acceptable than being individually questioned on these sensitive issues as they might be exposed as having little knowledge, or had shame for certain practices if asked directly. Within the group social and cultural resources and support were readily available, therefore it was expected to encounter a more spontaneous and honest participation (72, 75).

For this type of qualitative analysis the researcher should have theoretical sensitivity. This refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand and the capability to separate the pertinent from that which is not pertinent. Theoretical sensitivity comes from:

- literature (wide reading),
- professional experience (professional expertise in the field of nutrition),
- personal experience (having had children and being responsible for their feeding, nutritional state and ultimately their growth, health and wellbeing),
- analytic process →
  - collecting the data (asking questions)
  - interacting with the data
  - making comparisons
  - thinking about what one sees and hears
  - making hypothesis
  - developing small theoretical frameworks about concepts and their relationships (90).

6.2.2 FOCUS GROUPS

Focus group interviewing is one of the best methods for discovery and exploratory research, where very little is known about the phenomenon of interest, such as in this particular research study (91). Topics on attitudes and cognitions are most suitable for focus groups. The hallmark of focus group interviewing, according to Morgan (1988:12) (80), is *the explicit use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group.* The philosophy behind the group interaction is that more useful data are cost-efficiently generated in this manner, than would be otherwise available (72, 80). Greenbaum (1988:18-19) (72) provides the following explanation:

- ☞ most people feel more comfortable talking about almost any subject when they are involved in a discussion as part of a group,
- ☞ the interaction among the members of a group will result in the participants' being more talkative due to the stimulation generated by the feelings of others in the group,
- ☞ the group dynamics provide insights into how peer pressure plays a role in the degree of overall acceptance of a concept, product, or idea being presented.

The focus group strategy as such is thus very useful as a self-contained means of data collection, but can serve especially well as a supplement to both quantitative and other qualitative methods, facilitating the interpretation of results and adding depth to responses (80, 91).

6.2.2.1 Advantages and disadvantages of focus group research

The advantages / strengths and limitations / weaknesses of group interviewing relative to other types of research are compared in Table 26.

TABLE 26: ADVANTAGES / STRENGTHS AND LIMITATIONS / WEAKNESSES OF FOCUS GROUP RESEARCH

ADVANTAGES		LIMITATIONS	
1.	Provide data from a group of people more quickly	1.	Small numbers of participants limit generalization to a larger population
2.	Usually costs less in terms of time and transcription costs	2.	Interaction leads to responses of group members not being independent of one another - thus restricting generalization
3.	It is one of the few research tools available to obtain data from children or other illiterate individuals	3.	Results obtained may be biased by a very dominant or opinionated member, while reserved members may be hesitant to talk
4.	Allows the researcher to interact directly with subjects - clarify answers, observe non-verbal responses, ask contingent questions	4.	The "live" nature of the interviews may lead to the researcher placing greater faith in the findings than is warranted
5.	Open response formats lead to obtaining large amounts of data in the subject's own words	5.	Open-ended nature of responses obtained makes summarization and interpretation difficult
6.	It allows subjects to react and build on responses of others	6.	The moderator (interviewer) may bias results by knowingly /unknowingly providing cues about desirable answers.
7.	Are very flexible in terms of topics and settings	7.	Groups result in less data gathered (70% of individual interviews)
8.	Focus groups can be assembled on very short notice		
9.	Results are easy to understand		
STRENGTHS		**WEAKNESSES**	
1.	Easy to conduct	1.	Not based in natural settings — leads to uncertainty about the accuracy of subject responses
2.	Ability to explore topics and generate hypotheses — especially on new topics	2.	Researcher has less control over the data generated
3.	Provide an opportunity to collect data from group interaction on a specified topic	3.	When relying on interaction in groups, there is always uncertainty whether or not it would mirror individual behaviour

(Adapted from 80, 91)

The simplest test to determine whether focus groups are appropriate for a research study is to ask how actively and easily participants would discuss the topic of interest. The topics of interest for the qualitative methodology in this research study were the feeding practices of children, as well as the nutrition knowledge and attitudes of the mothers/caregivers towards nutrition. Mothers/caregivers usually discuss their children freely among themselves, thus it was argued an appropriate technique for this project (80).

6.2.2.2 Design of focus groups

Kirk and Miller in Morgan (1988:38) (80) describe qualitative research as generally having four phases, namely planning, observation, analysis, and reporting. Figure 9 lists the sequence of steps in the design of focus group interviews (91).

Problem definition / Formulation of the Research Question

↓

Identification of Sampling Frame

↓

Identification of Moderator

↓

Generation and Pretesting of Interview schedule

↓

Recruiting the Sample

↓

Conducting the group

↓

Analysis and Interpretation of Data

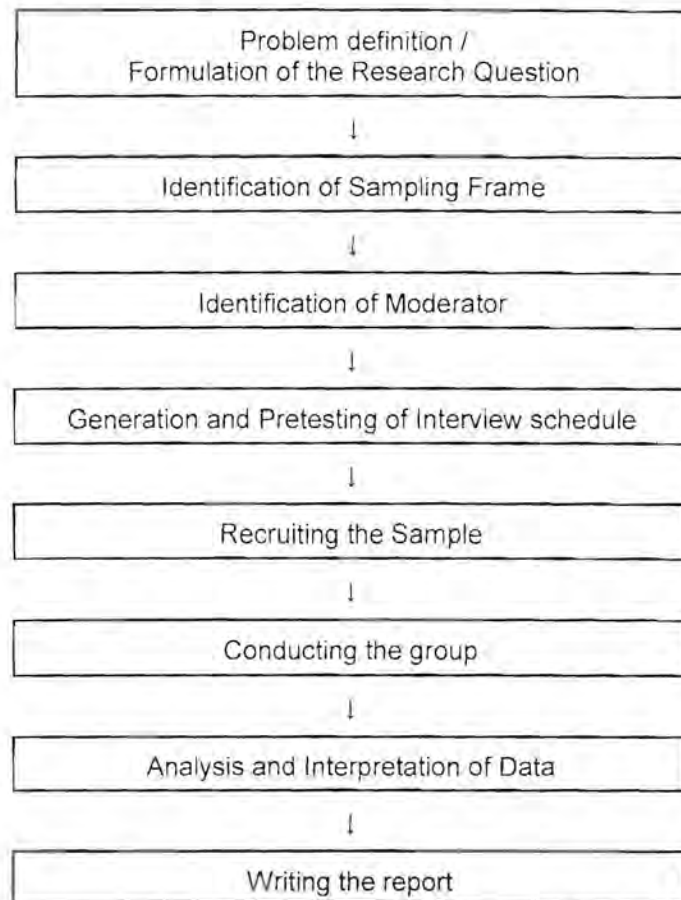↓

Writing the report

FIGURE 9: STEPS IN THE DESIGN AND USE OF FOCUS GROUPS (76)

In the planning stages of focus group research various factors must be considered to achieve the best results possible. These factors, and the application thereof in this research study, are summarized in Table 27.

TABLE 27 : FOCUS GROUP INTERVIEW CONSIDERATIONS (Adapted from 72, 80, 91)

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Ethics	- Invasion of privacy, due to taping of interviews - Inherently all participants are sharing their views or perceptions with each other, thus restricting the suitable topics	- Mothers/caregivers were properly informed of the research procedure and signed a form of consent as approved by the Ethics & Protocol Committee of the Faculty of Medicine (UP) - Participation was voluntary
Budget	- Salaries to moderators (interviewers) - Travel to research sites - Payments to participants - Tape production and transcription	- Salaries were paid to the two moderators for the individual and group interviews and for the transcription sessions - The researcher travelled once a week on the specific clinic day to the research site, as well as between the two clinics to monitor the research procedures and process as such - Participants received an incentive (food hamper) to participate in the research. Each mother/caregiver had to be present twice and the group interview was a long session - Tape-recording equipment was hired daily as required from the Media Department of UP. Recording quality had to be checked beforehand. Tapes were separately marked for each session - Transcription required a second step where a specialist from the same ethnical group as the moderators was required to listen randomly to tapes and check transcriptions for correctness and thoroughness of the transcription of the interviews

Time constraints	Time consuming tasks include:
	- Recruitment
	- Transcription
	- Transcription analysis
		- Recruitment was a time consuming process as children were needed in very specific age categories for each focus group
		- Transcription of any one interview took longer than the initial interview in order to be sure that no data were lost. This was done immediately after completion of the day's research
		- Transcription analysis was the most time consuming task of all:
		  * transcriptions (all the focus group data) were entered into a spreadsheet format of the interview schedule
		  * all the age categories were grouped together per response category
		  * categories (sampling and recording units) were made to sort the data
		  * individual coders coded the data
		  * the data were presented

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Number of groups	- Increasing the number of groups will lead to an increased research time period - For exploratory research (aimed at getting perspectives) 3-4 groups are sufficient - For detailed content analysis 6-8 groups are required - An important determinant of the number of groups is the number of population subgroups required. With several distinct population segments separate groups should be run in each with a minimum of 2 groups / segment. - Determine a target number of groups in the planning stage, but have flexible alternatives available	- Two focus groups per age group (six age groups) were planned per clinic This meant 24 focus groups in total, which automatically increased the research period - However, content analysis, as the choice method of analysis, requires only 6-8 groups - With the two recommended groups per segment the target was 24 groups. However, to achieve the required number of children per age category more groups were needed. Finally the data of 26 focus groups were used
Size of groups	- Use moderate sized groups: 6-8, 8-10, 6-12. - Recommendation: not <4 and not >12 - Groups with less than 6 members produce dull discussions and more than 12 members are difficult to manage - Recruit more than the required number; at least 2 usually do not show up. Rather have too many participants than to cancel the focus group due to inadequate numbers - Small groups are used where a clear sense of each subject's responses is required (less productive, more costly) - Large groups are used for exploratory research. It can lead to "social loafing": individuals participate less; the group carry the discussions (more difficult to manage, require more moderator involvement)	- An average number of 6 members per focus group was strived for in recruitment. It was difficult to recruit more than 6 members in advance due to practical reasons. If the mothers/caregivers did not show up as expected, new recruitment was done at the clinic - The medium sized groups (n=5-6) seemed to produce the best results. In smaller groups mothers/caregivers were more reluctant to talk and in bigger groups one or two mothers/caregivers did most of the talking

Layout of the group	- Seating arrangements should be in a circular or ⊔ - shaped format with the moderator at the head of the table
	- Seat subjects around a table - it provides comfort, security and personal space
	- Maximize eye contact
	- Increase the balance of responses from all the subjects Seat the least talkative members directly across from the moderator, and the most talkative off to either side
	- Facilities must be chosen with the quality of audio-taping in mind
		- A semi-circular arrangement around a table was strived for with the moderator at the head of the table
		- Seating was arranged around a table:
		    - for the comfort and ease of the mothers/caregivers
		    - to accommodate the tape recording equipment
		    - to put the moderator at ease
		    - to generally improve the discussion
		- Maximum eye contact was achieved due to this arrangement
		- Due to practical reasons, seating was arranged randomly. The moderator was instructed to involve all the members in answering questions or giving responses
		- Only clinic facilities were available for the research which were prone to much noise, heat and stuffiness; however the best was made of the less ideal circumstances

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Source of subjects	- Randomly sampled groups hold no guarantee for shared perspectives - Choose samples theoretically from population segments that will provide the most meaningful information. Focus groups should be selected systematically with convenience sampling - Always match the sample with the objectives of the research - If specific categories of subjects are needed, put in a real effort to locate them - Avoid mixed categories of subjects - If separate groups (different categories) are run, about 4 groups per type is indicated - Rather use strangers than friends in one group to produce more variance in opinion in group discussions	- Convenience sampling was used. Mothers/caregivers with babies / toddlers in the appropriate age groups were required as they could give the most meaningful information on feeding practices of children - Effort went into getting children in the appropriate age categories. Due to this the data collection period was prolonged in order to find suitable children especially in the older age groups, as these children did not visit the clinic regularly anymore - Categories of children were never mixed and four groups per category was completed. This favoured the analysis between categories and subpopulation groups - It was not always possible to exclude friends in a group. The moderator always tried to involve each individual in the group to overcome the problem of shared opinion

Level of moderator involve-ment	Treated as a continuum:
	low level →
	- play small role in group discussion, subjects should speak for themselves
	- have minimum of comments
	- for exploratory research and full-scale content analysis
	- advantage: it has the ability to access the subject's interests
	- disadvantage: it supplies a disorganized content which is difficult to analyze, and some topics may never come up
	high level →
	- control the set of topics and the group dynamics
	- best method to get the most useful information from the group
	- for an externally generated agenda, like comparison of data or answers to particular questions
	- advantage: the moderator could cut off unproductive discussions; probe where necessary; ensure coverage of desired topics; allow for changes in discussions
	- disadvantage: the incorporation of moderator bias
	- Choose moderator involvement according to the type of information needed
	- Ideally only one moderator should be involved in all the focus groups, although it is not always easy to implement
		- High level of moderator involvement was chosen due to the research aim and the specific research population
		- an externally generated agenda (to ensure coverage of topics) was used to achieve the research aim (high moderator involvement)
		- moderator bias was countered by:
		    - training the moderators thoroughly,
		    - using an moderator / interviewer guide with specified questions and probes as a guideline
		- one moderator for all the focus groups was impractical as both clinics operated simultaneously. Two moderators were used; one per clinic exclusively

FACTORS	CONSIDERATIONS	APPLICATION IN THIS RESEARCH
Location	- Participation is more likely if the location is close to home/work - Travel time is more critical than distance - Locations in well-travelled, familiar areas are likely to be perceived as more attractive - Use a "neutral site" like a church, or meeting room	- People attending the local clinics were recruited - Care was taken to finish interviews on time as some people travelled a fair distance and wanted to be home at lunch time. This ensured cooperation and prevented restlessness - The "neutral site" was the health clinic, which is well accepted in the community and frequented by the community members required for the research

Inter-viewing styles	- Directive and non-directive styles are the two extremes styles; rather use a style on the continuum
	- The purpose of the research determines the style used:
	    * unstructured: for new ideas
	    * structured: for hypothesis generation or diagnosis of problems
	- The two types of questions used:
	  open-ended: - broader in nature
	      - allows any information
	      - increases the amount of data
	      - less reliability and validity
	  closed-ended: - for polarizing opinions for further discussion
	      - where reliability/replicability is essential
	- Primary questions: to introduce new topics, secondary questions: to probe and give detail
	- Start with general questions and move on to more specific questions. Other techniques can also be applied
	- Supportive leadership style is the most successful. The leader shows concern for the subject's wellbeing and personal needs, is approachable, considerate, friendly, and treats others as equals
	- A high compatibility between group members and moderator leads to greater interaction and more open communication
	- Aids are useful to help stimulate discussions, e.g. storytelling, demonstrations, samples, displays
		- The style used for this research was mainly directive with a few open-ended questions
		- Nutrition-related issues needed to be uncovered, thus a structured interview style was used
		- Both open-ended and closed-ended types of questions were included in the interview schedule. This ensured answers of a broader nature but also indicated opinions or responses where needed
		- Primary questions were used for the introduction of a new topic. Thereafter secondary questions were used to provide more specified data on a topic and to serve as probes
		- Six interview topics were included in the interview schedule. The first was the most general / easy and the last the more difficult and sensitive
		- The supportive leadership style was used. The wellbeing and personal needs of the mothers/caregivers were always of primary concern. Treating others as equals and overall friendliness were some of the main values nurturing human relations
		- Both moderators initially were care group leaders and thus very sensitive and considerate towards the group members. This produced a lot of goodwill and cooperation in getting the research done
		- Visual aids were used to stimulate the discussions. Samples of food products and household eating utensils and demonstrations by group members were used

6.2.2.3 Design of the interview schedule

Morgan (1988:54) (80) presents four broad criteria for focus group observation:

- ☞ it should cover a maximum range of topics,
- ☞ It should provide data as specific as possible,
- ☞ it should encourage interaction that explores participants' feelings in some depth,
- ☞ it should take into account the personal context that participants use in generating their responses to a topic.

The interview schedule is central to the observation process. The typical length of a session should be no more than one to two hours during which the focus should be maintained; not exploring too many topics. Morgan (80) advises that four to five major topics with preplanned probes under each, are probably ideal. Stewart (91) states that most interview schedules consist of 12 or less major topics. With high moderator / interviewer involvement, it is useful to construct an interview schedule that can be followed in the same order with each of the groups. A good guide will create a natural flow of discussion on the topics and even some overlap between topics. The last option was chosen for this research study.

The first step in creating a schedule is to list all the questions that need to be answered and then organising them into a set of topics rather than questions, since this would improve the discussion flow (80). Although it may appear that less structure is favoured for focus group interviews, this may not always be the case. Certain people need help in expressing a response, therefore a key word or cue in the interview schedule may be useful. Sometimes more specific cues are needed to ensure that aspects easily forgotten are discussed. It is important however for the moderator / interviewer not to "lead" the mothers/caregivers answers. Structured questions are also useful when mothers/caregivers are uncertain or embarrassed about particular responses and would therefore not respond unless asked directly for fear of being wrong. Questions that include probes like *how, why, when, under what conditions* are useful in the group interview. Additionally, questions should be phrased simply in language that the mothers/caregivers understand (91).

Development of the interview schedule for this research study An interview schedule (see Addendum B) was developed taking into consideration all the fore-mentioned aspects. Due to the fact that transcultural research was undertaken and that the moderator / interviewer would be continuously working from a first to a second language, it was decided to go for a fairly structured interview schedule. When the pilot study was conducted, it was found that the mothers / caregivers did not understand or interact well if a statement or a topic was put forward as a statement; a topic put in the form of a question was better understood. As sensitive issues were discussed, structured questions with suitable probes were more useful. Very simple language was used for the setting of the questions and this was checked by the moderators / interviewers beforehand.

Six major topics on nutrition of the child were identified to be included in the interview schedule. Four topics covered the feeding practices and two topics the nutrition knowledge and attitudes towards nutrition. Aspects that were discussed, included eating patterns, types of food necessary for healthy eating, foods linked to important body functions, the concept of healthy food and healthy eating, money and food,

traditional food preparation techniques and other customs. Aspects concerning feeding practices that among others received attention, included the duration of breast feeding, the time when weaning / complementary foods were included for the first time, what the first and following weaning foods were, the type of milk products that were given when breast feeding was stopped, the type of formula used, and so forth. All the questions / probes included in the interview schedule were identified from the literature as being those that might identify the feeding practices, nutrition knowledge and attitudes towards nutrition of the members of the study group. The interview schedule was checked / tested for content and feasibility twice. First the broad outline of identified topics and sub-sections thereof were verified with the moderators / interviewers and the care group manager of these communities to determine if the topics were suitable, and whether the mothers/caregivers would be able to answer questions/probes appropriately. After the initial approval of the draft, the interview schedule was further developed and finalised. The moderators / interviewer again pretested the interview schedule, after which it was finalised for implementation.

6.2.2.4 Conducting the focus group interview

An atmosphere of trust and openness should be achieved from the start of the discussion by stressing anonymity, empathy, and the value of opinions. The general list of topics to be discussed, as well as the ground rules should be stated clearly. During the discussion all members of the group should be encouraged to participate; if not voluntarily, they should be asked questions or opinions directly. Moderators / interviewers should be sensitive to the reactions of the group members and act accordingly. The moderator / interviewer should also manage the time allocated to discussions of the various topics in order to achieve coverage of all the topics in the available time. It is also important for the moderator / interviewer to probe the mothers/caregivers for more information as they do not always say all they think or know. The group may also be asked their opinion on any one mother's/caregiver's explanation (80, 91).

Conducting of the focus group interview as implemented for this research study Before commencement of the focus group interviews, the moderators / interviewers were intensively trained by the researcher with regard to all the forementioned aspects concerning the conducting of focus group interviews. (See Addendum E.)

During the execution of the focus group research, the following procedure was implemented (also refer to Table 27):

- Anonymity, value of opinions, and voluntary participation were explained during the first interview when the mothers/caregivers were recruited and the form of consent was signed.
- The group was gathered and seated around the table in an area in the clinic allocated to the researcher for the duration of the study.
- Introductions were done between the researcher, moderator / interviewer and all the mothers/caregivers.
- It was stressed that the researcher did not form part of the interview process and might only be present part of the time. This was well accepted since the researcher clearly did not understand the language used for the interviews.
- The general list of topics was explained.

☞ The ground rules were established, e.g. that every individual's responses were needed to ensure high quality information; that this was not a test in terms of correct or wrong answers; rather that answers given would be viewed as opinions; that honest answers and opinions should be given and that refreshments would be served throughout the session by the researcher without interrupting the interview.

☞ The moderator / interviewer encouraged each mother/caregiver constantly to participate and if they were not responding spontaneously, she directly asked their opinions.

☞ When it was obvious that the group had problems with a question, the probes on the interview schedule were used by the moderator / interviewer.

Moderators / interviewers should make field notes during each session. With an inexperienced moderator / interviewer this is not always possible due to time constraints, language problems and the inability to write down important additional information. This type of data can also be collected by means of a debriefing interview directly after the session. Since these notes involve some interpretation it can be considered part of the evaluation / analysis rather than data collection (80).

The moderators/interviewers used for this research study were inexperienced and thus not able to make notes during the interview. Space was provided with each question/probe on the interview schedule for the purpose of transcription and for taking relevant notes during the interview by the moderator/interviewer, e.g. the measuring/preparation techniques for formula feeds. Each moderator/interviewer was instructed to record any useful information on the interview schedule as the interview progressed. A debriefing interview was done together with the transcription of focus group data directly after each interview. In this way it was ensured that all the valuable information that the moderator/interviewer could contribute, was recorded.

6.2.2.5 Analysis of focus group data

Although the purpose of qualitative research is an in-depth exploration of a topic, the amount of analysis required largely depends on the aim of the research (91). The first step in any kind of qualitative analysis would be to transcribe all the interviews completely. Transcription will facilitate further analysis and will also provide a permanent record of the interviews. These transcriptions can then be supplemented with the notes from the researcher and / or moderator / interviewer, as well as a summary of the events as they were observed by the researcher (91).

The data gathered in qualitative research usually comprise two types of content which need to be analysed, namely manifest and latent content.

☞ **Manifest content:** the visible, surface content. In other words, that which is obvious, like counting certain words to see if the subjects know anything about a subject. The words serve as indicators. The ease of coding and the reliability are the advantages of this method. The disadvantage however is that there is little validity in terms of the *meaning* of the words as such (73, 74).

☞ **Latent content:** the underlying meaning. Make an overall assessment after reading the complete answer. The advantage of this method is that the underlying meaning can be determined, but at the disadvantage of low reliability and specificity (73, 74).

Due to the apparent weaknesses of each type of content, it is recommended that both types of content should be analysed. If the results from both types of content are in agreement, the final result is strengthened (73, 74).

Morgan (1988:64) (80) states that the two basic approaches to analysing focus group data are a strictly qualitative or **ethnographic summary** and a systematic coding via **content analysis**. This is supported by Miles & Huberman (1994:7)(89) where it is indicated that an ethnographic content analysis approach is implemented with categorization of elements and exploration of their connections. Ethnography can be defined as the description of information, or rather it is qualitative information which relies more on direct quotation of the group discussions. Content analysis typically produces numerical descriptions of the data, or rather the systematic coding of data (80). Although these methods can be used individually, there is an additional strength in the combination of the two methods. According to Morgan (1988:64) (80) " a largely ethnographic approach may benefit from a systematic tallying of one or two key topics, while a basically quantitative summary of the data is improved immensely by including quotes that demonstrate the points being made."

The analysis should be done with a group-for-group approach, since the group is the actual unit of analysis (80, 88). The cut-and-paste technique is often used for analysis (80, 91). However, when an interview schedule is used in the group discussion, the topics in the guide will serve as the structure for organizing the analysis of topics. The guide organizes the discussions of each group around the same set of topics and in the same order, which is a very favourable aspect during the analysis of more structured group discussions as this allows for comparisons between the groups (80). Patton (1980) (88) corroborates the fact that if a standardized open-ended interview is used, it will be easy to do cross-case or cross-interview analysis for each question in the interview schedule.

Methodology for analysis of qualitative data as implemented for this research study The focus group discussions were recorded on tape. A transcription of the interview, together with a debriefing interview with the moderators / interviewers was done directly after each focus group had been completed. This was necessary due to the inexperience of the moderators / interviewers, the distance to be travelled by the researcher on each research day and the availability of the moderators / interviewers. Everything for each focus group had to be completed on that particular research day to prevent data being lost due to lapses in memory. The researcher listened again to the whole tape recording and wrote down every response that was made with the aid of the moderator / interviewer who acted as translator. All the information was checked and double checked as soon as possible after completion of an interview so that the least information was lost. If an answer came across vaguely, the researcher verified it with the moderator / interviewer. After completion of all the interviews and transcription of all the tape recordings an independent specialist (a dietitian from the same cultural group who was fluent in the language used during the interviews) was used to verify the translations and quality of the data produced.

The final transcription of the data (all 26 focus groups) resulted in a voluminous data transcription document consisting of data in six parts that covered 121 pages (document available on request). The transcribed data were compiled in a format that would ease the comparison of the results in the various categories and

between the age groups (cross-interview analysis). Both ethnography and content analysis were used in the analysis of data. Ethnography by means of direct quotations was used to impact on the content analysis and to verify the data (80). For the content analysis, two coders were used to categorise the data. The final results from the content analysis were presented in table format in an effort to communicate the huge volumes of data and to describe significant patterns in the data that were relevant to the research study (80).(Refer to Chapter 8.)

Content included in this research study was analysed in terms of manifest as well as latent content. Many responses to questions/probes could be classified as manifest content. These included countable objects or concepts like the ages of the children, types of teachers or informants, types of actions, frequencies, volumes, utensils, foods, etc. The latent content concerns the underlying meaning. As such it consisted of the reasons given by the mothers/caregivers for the practices or actions they performed, their beliefs concerning nutritional knowledge, their reasons for the nutrition related attitudes that they had and how these might have influenced their practices.

As ethnography is only a description of what was said in the focus group discussions complemented with direct quotations, the content analysis technique will be discussed in more detail as this entails a specialized procedure for processing the transcribed data.

Content analysis Krippendorf (1980:21) (81) defines content analysis as "a research technique for making replicable and valid inferences from data to their context". Any effort to interpret a focus group interview represents analysis of content. Content analysis therefore includes the analysis of both manifest and latent content of the data in order to discover the meaning or the symbolic meaning of messages and the specific implications for the research question (81, 91). Meaning is always relative to the communicator. Any message usually has more than one meaning, depending on the background or angle of interpretation used. Content analysis should therefore be predictive of something that is observable in principle, aid in decision making, help to conceptualize that portion of reality that gave rise to the analysed text (81). The meaning of any message may be interpreted in relation to the intentions of the sender, the receiver's cognitive / behaviour effects, the institution within which it has been exchanged, or to the culture within which it plays a role (81). In this research study the meaning of the data was interpreted in terms of the behaviour identified and the culture within which it occurred.

Berelson (1952) in Krippendorf (1980:33-34)(81) lists several (17) uses for content analysis. Within the context of this research study the following three uses were regarded applicable:

- "to reflect attitudes, interests, and values ("cultural patterns") of population groups" (e.g. in terms of nutrition practices)
- "to reveal the focus of attention" (e.g. concerning child feeding and nutrition)
- "to describe attitudinal and behavioural responses to communications" (e.g. in terms of nutrition related questions).

The definition of content analysis delineates the object of inquiry and places the researcher into a particular position vis-à-vis his reality. Krippendorf (1980:25-28)(81) provides a conceptual framework (refer to Figure

10) within which the role of the researcher can be summarized. It is simple and general, and consists of a few basic concepts:

☞ the data as communicated to the analyst (which data are analyzed, defining the data, population it is drawn from, etc.)

☞ the context of the data (clarity of the context relative to the data, define natural boundaries)

☞ how the analyst's knowledge partitions his reality (interest, knowledge will determine the construction of the context)

☞ the target of a content analysis (clearly stated)

☞ inference as the basic intellectual task (from data to context, justify in terms of stable factors, formulate data-context relationships: data appear as its independent variable and the target its dependent variable)

☞ validity as ultimate criteria of success (evidence for validation is needed: repetition, comparison with similar information from quantitative methods)(80).

The framework is summarized in Figure 10. According to Krippendorf (1980:28)(80) the framework suggests that data become dissociated from their source or from their surrounding conditions and are communicated one way to the analyst. The analyst places these data in a context that he constructs based on his knowledge of the surrounding conditions of the data including what he wishes to know about the target of the content analysis. Knowledge about the stable dependencies within the system of interest is formulated as analytical constructs which allow him to make inferences that are sensitive to the context of the data. Content analysis results should always represent a characteristic of reality and the nature of this representation must be verifiable in principle.
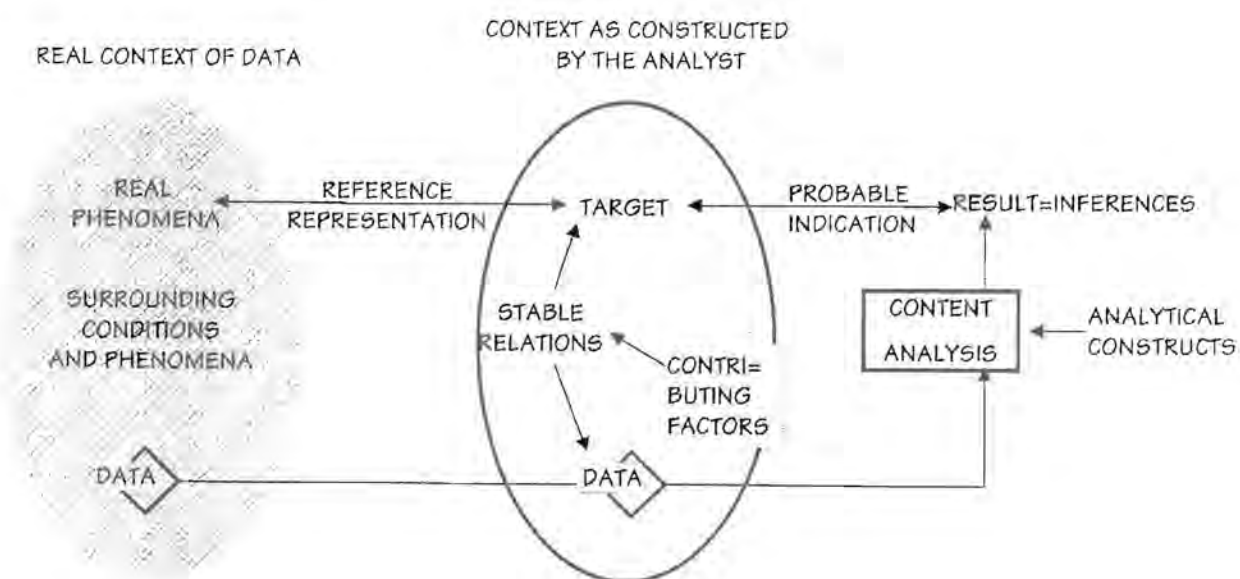

FIGURE 10 : THE FRAMEWORK FOR CONTENT ANALYSIS (81)

The framework serves three purposes:

☞ prescriptive (guiding the conceptualization and design of practical content analysis)

☞ analytical (facilitating the examination of content analysis results), and

☞ methodological (directing growth and systematic improvement of methods for content analysis)

Janis (1965) in Krippendorf (1980:33)(81) and Stewart (1990:107)(91) provide a classification of the three different types of content analyses, based on the purpose of the investigation:

Pragmatical content analysis (PCA): This deals with procedures that classify signs according to their probable causes and effects. The emphasis being on why something is said. This type of analysis is used when trying to understand the characteristics or the attitudes of a group of people.

Semantical content analysis (SCA): This deals with the procedures that classify signs according to their meanings. This type of analysis is used when trying to describe the positive and negative characteristics of people.

Sign-vehicle content analysis (SVCA): This deals with the procedures that classify content according to the psychophysical properties of signs. Counting the number of times specific words or types of words are used. This type of analysis is used to evaluate emotion-laden words referring to something.

For the purpose of this research study the pragmatical type of content analysis (PCA) was the most suitable type of analysis to use within the context of the aim of the research.

During the process of content analysis, several steps need to be followed. The procedure entails the following:

① data making
①-1 unitizing
①-2 sampling
①-3 recording
② data reduction
③ inference
④ analysis
⑤ validation
⑥ testing for correspondence with other methods
⑦ testing hypotheses regarding other data.

The content analysis procedure and methodology as implemented in this research study

①   **DATA MAKING** (Also refer to Table 67 in Chapter 8 for a summary of the data making for this research study)

①-1   Unitizing   Defining the appropriate unit or level of analysis. This could be words, sentences, sequences of sentences or dialogue about a particular subject (81, 91). In content analysis there are three kinds of units to consider:

①-1.1 *Sampling units* (SU's)

SU's are parts of the larger whole that can be regarded as independent of each other. It usually has physically identifiable boundaries (91). SU's represent the way the information in the discussion is divided and therefore the SU's provide a way of organizing information that is related (91). SU's are also important in sampling and provides a basis for statistical considerations (81).

For this research study the six main topics for discussion, as identified in the interview schedule, served as the SU's:

- General knowledge on infant feeding and health
- Breast feeding
- Bottle feeding
- Weaning
- Nutrition knowledge
- Attitude towards nutrition

①-1.2 *Recording units* (RU's)

RU's grow from the descriptive system that is employed (81, 91). RU's are subsets of SU's and represent specific statements (91). RU's are the analyzable part of a SU's. Therefore the RU's collectively carry the information within the SU's and provide the basis for the analysis of information (81, 91). Each specific segment of content is characterized by placing it in a given category (81).

For this research study the interview schedule was constructed with regard to the SU's. The RU's were accordingly identified beforehand, with all the questions / probes relevant to a topic (SU) grouped together under that heading. (See Interview schedule, Addendum B.)

It is very important to define the RU's appropriately, because this may influence the interpretation of the content of a particular focus group discussion. Five approaches to defining RU's are distinguished (81, 91):

①-1.2.1 *PHYSICAL UNITS (PU's)* This type of units are used to divide the content of a medium by physical properties such as time, length, size, or volume rather than by the information it carries (81, 91). Stewart (1990:110)(91) states that the boundaries of this type of units are determined by time and space. PU's require essentially only mechanical counting with minimal cognitive input for their identification therefore increasing their reliability and efficiency. However, unless the boundaries of physical units coincide with those of the content to be described, they can cause unreliabilities in recording and uninteresting findings (81) (see Table 67, Chapter 8 for application).

①-1.2.2 *SYNTACTICAL UNITS (STU's)* These units are based on the natural grammar of a medium. No judgements on meaning are required. The researcher must be familiar with the grammar, medium or format of the material used. Context is often explained in this way. Words are the smallest and safest recording unit in a written document, as is a news item in a broadcast or an act in a show. The source of the communication thus specifies the type of unit used (81, 91). The reliability and efficiency are high but not always productive in subsequent analysis. Context units are often defined in this way (81). Not applicable for this research study.

①-1.2.3 *REFERENTIAL UNITS (RFU's)* These units may be defined by particular objects, events, persons, ideas, etc. to which an expression refers. The reference may be made in one or more words, directly or indirectly, about a specific topic; in other words, any expression that refers to the same person / object / event (81, 91). RFU's are the units of choice to define SU's and RU's. They are indispensable when it is the task to determine how something happens or what the values, attitudes, attributes and beliefs are. The researcher should be familiar with the semantics, symbols and the referential meaning of elements. The efficiency is high, but the reliability is questionable, because all the references made are not always clear (81) (see Table 67, Chapter 8 for application).

①-1.2.4 *PROPOSITIONAL UNITS (PPU's)* These units recognise objects and their attributes, thus offering particular thoughts about the referent object or person. It is the basis for evaluation of assertion analysis (81, 91). PPU's require considerable familiarity with the syntax, semantics, and logic of the source language, with linguistic transformations such as rephrasing, completion and kernelization. Often the whole document needs to be rewritten, therefore the process can be inefficient and only moderately reliable (81). Not applicable for this research study.

①-1.2.5 *THEMATIC UNITS (TU's)* These are more global interpretative or explanatory sets of statements. Recurring systems of beliefs or explanations of events represent TU's (81, 91). It requires a deep understanding of the source language with all of its shades and nuances of meaning and content. It may be relatively easy to identify themes, but it is more difficult to identify them reliably. It is the most unreliable and ineffective units that can be used, and are more commonly avoided in content analysis, or at best used to circumscribe the fuzzy universe from which the sample or PPU's are drawn (81) (see Table 67, Chapter 8 for application). The aim for the choice of units would be to choose those that are empirically the most meaningful and productive units that are both efficiently and reliably identifiable and that satisfy the requirements of the available techniques (81).

①-1.3 CONTEXT UNITS (CU's)

CU's provide a basis for the interpretation of a RU. It may be identical to a RU or it may be totally independent. It is often defined in terms of the syntax or structure in which a RU occurs. The CU's may overlap and contain many RU's (91). The CU's represent the environments or context in which the statements occur. CU's are thus of importance in the process of describing the RU's (see Table 67, Chapter 8 for application).

①-2 *Sampling* Sampling of the available data is necessary to provide a representative subset of the larger population. This is unnecessary if the whole set of data is used (81, 91).

For this research study the sampling was done beforehand, and the focus groups were compiled from mothers/caregivers of children in six specified age categories. A structured interview schedule was used due to the characteristics of the specific community and the whole interview was used for analysis (refer to Table 37). (See Addendum B.)

①-3 *Recording* Data must be recorded in such a way as to ensure the reliability and meaningfulness. Recording does not only involve rewriting the statements. It implies using the defined units of analysis to classify the content of the discussion into meaningful categories which will aid in the explication of data (91). Under ideal circumstances, recording will involve more than one judge, so that the coding of each specific unit can be examined for reliability, and sources of disagreement can be identified and corrected. There is a difference between inter-rater reliability and assuring that an individual element is coded reliably (91). Stewart (1990:111)(91) concludes that in most focus group projects general rater reliability is more important because the emphasis is on general themes rather than specific units. Data making tends to be the most time consuming stage of content analysis; the reason being that data making occurs after the observation, in contrast to survey research where data making occurs prior to observation.

For this research study a tested structured interview schedule (Addendum B) was used. The data were transcribed, using the structured interview schedule as outline. For both clinics all the responses of all the groups within an age category were grouped together. Each response given was coded in order to relate it to the specific group within which it had been generated. All six age categories were listed in table format next to each other. With this method of transcription all the similar and different responses could easily be identified between age groups and between clinics to aid in the description and discussion of the data. Response categories were created in order to assemble the data. Two independent specialists in the field of nutrition (registered dietitians) were asked to code the data according to the specified categories. The coding was checked by the researcher, and the outcome was very similar to that done by the two specialists. It can be concluded that the inter-rater reliability seemed to be high. Where differences in opinion occurred (in a very few cases), the researcher and study leader (both specialists in the field of nutrition) made a final decision on the allocation of the data to a particular unit.

② DATA REDUCTION

Miles & Huberman (1994:10) (89) refer to data reduction as " the process of selecting, focusing, simplifying, abstracting, and transforming data that appear in written-up field notes or transcriptions". Data reduction is not a once-only step, and should rather happen throughout the research process. It starts with the researcher making choices on the conceptual framework, the research questions, the methods and making summaries. It can be regarded as part of the analysis (81, 89). "It is a form of analysis that sharpens, sorts, focuses, discards and organizes data in such a way that "final conclusions" can be drawn and verified." Methods involved in data reduction include selection, summary, paraphrasing, subsuming under a larger pattern, etc. (89).

In this research study data reduction was partly achieved by the detailed documentation of all the transcribed interviews, and secondly by the creation of the categories for coding (see Figure 15 in Chapter 8).

③ INFERENCE

To justify any inferences from the data, some knowledge or empirical evidence about the connections between data and what is to be inferred from them, is essential. This knowledge serves to place data in a suitable context (81). In order to effectively draw conclusions and take action, it is necessary to have a data display, which is an organized, compressed assembly of information (89). According to Miles & Huberman (1994:11)(89) better data displays (graphs, matrixes, charts, etc.) are a major avenue to valid qualitative analysis.

In this research study tables were used to display the data in the reduced form. The tables used showed the different units of analysis in relation to the age-category samples. The responses from the two clinics (Makapanstad and Mathibestad) were simultaneously compared by means of frequencies per clinic.

④ ANALYSIS

Analysis concerns the identification and representation of patterns that are noteworthy, statistically significant, accounting for or descriptive of the content analysis results (81). The specific types of analysis that might be used will depend on the purpose of the research. Basically any analytical tool may be used; from simple descriptive analysis to multivariate associative techniques. Much of the content analysis that occurs in the context of focus group data tends to be descriptive. Focus group data are usually amenable to the most sophisticated quantitative analysis (91). It is common for focus group data to be used for the purpose of developing hypotheses that then are tested or validated with other types of research. Focus group results also need to be validated, usually with additional focus group data or other methods such as survey research or formal experiments (91).

For this research study the analysis of data was done within the units as identified when data making took place. The analysis was organized in terms of the six sampling units. The identified topics / themes delineated the context within which the data reduction was done for each of the six sampling units. For each of the identified topics/themes all the relevant RU's were identified and discussed, themes and context were identified and explored, and the essences revealed within these data sets were strengthened by means of ethnographic descriptions (see Table 67, Chapter 8). The data were simultaneously displayed and discussed.

⑤ VALIDATION

The meanings from the data have to be tested for validity. The whole process also needs to be well documented to refine the methods used and to make them generally more usable by others (89).

⑥ TESTING FOR CORRESPONDENCE WITH OTHER METHODS

During the discussion and exploration of the topics/themes, findings were substantiated from the literature, as well as from the qualitative results on the study group.

⑦ TESTING HYPOTHESES REGARDING OTHER DATA

Not applicable for this research (81).

6.3 VALIDITY AND RELIABILITY OF MEASURING INSTRUMENTS

Within the qualitative research paradigm the same reliability and validity issues are of importance as in all scientific measurement. Perfect reliability and validity are the ideal, but difficult to accomplish. As stated previously, reliability deals with the dependability and consistency of an indicator, while validity is concerned with the actual meaning of an indicator (73) (see Chapter 5 for the discussion on reliability and validity).

6.3.1 RELIABILITY

In this research study the following measures were implemented to improve the reliability of the measures used:

- clear, well defined conceptual definitions were used,
- all the measuring instruments were pretested for understandability, applicability and clarity,
- the two moderators / interviewers evaluated the measuring instruments with reference to the level of difficulty and the understandability,
- the focus group interview schedule was tested twice before the actual research study took place — once in the development phase of the interview schedule and once during the training,
- multiple indicators were introduced for evaluating the different practices by means of different questions / probes concerning similar content in the different SU's,
- only one specific moderator / interviewer from the same ethnical group, and who was living in the same area, was used per clinics in order to achieve a high level of confidence with the mothers/caregivers,
- an moderator / interviewer was exclusively used per clinic, with no contact whatsoever between them. There was thus less chance for misinterpretations and prejudice,
- the moderators / interviewers were trained thoroughly on the research procedures,
- confidentiality was ensured by means of a formal consent form,
- the researcher never conveyed her own opinion, attitudes or beliefs to the mothers/caregivers or to the moderators / interviewers,
- leading questions were as far as possible avoided,
- an independent specialist was used to verify the translations and quality of the data produced by the two moderators / interviewers,
- during the content analysis phase, two independent coders were used to record data into the relevant data categories,
- the data categories created for the recording of the data were clearly specified with clear instructions as to the specific information required in order to ensure the correct construct being coded (73, 74, 86).

6.3.2   VALIDITY

In this research study the following measures were implemented to improve the content validity

- a thorough review of the literature was done concerning the causes and effects malnutrition, the feeding practices of infants and small children, as well as the knowledge component involved and the attitudes towards these issues,
- concepts were defined explicitly in terms of their meaning for this research study in order to prevent any misinterpretations,
- all the measuring instruments were approved by specialists in the field of nutrition,
- instruments were chosen to incorporate each aspect of all the studied concepts (73, 74, 86)