Chapter 4: Maximising the quality of data and results

"The rationale of a research design is to plan and to structure the research study in such a way that the eventual validity of the research findings are maximized through eliminating or minimizing potential sources of error or threats to validity" (Mouton, 1996:108).

4.1   INTRODUCTION

Objectivity, validity, and reliability can be considered methodological norms or requirements that a researcher must endeavour to satisfy unconditionally (Smaling, 1992:302). Although these strived-ideals were applicable to the whole process of research, it was for practical reasons, dealt with in this chapter. An in-depth revelation of the connotative meanings of these norms was beyond the scope of this writing. Some aspects, however, were exempted because of importance to this study.

A typology for these norms was constructed solely for the purpose of the discussion to follow (see Table 4.1). As an attempt to ensure objectivity, validity and reliability in this study, certain steps were taken to maximise the quality of the data and consequently also the results. These steps will become eminent throughout the discussion. 'Objectivity' is mentioned first because it applies to all the methodological approaches used in this study, namely quantitative, qualitative and Participatory Action Research.

Ethical and political issues also received attention in this writing, because research cannot be done at the expense of the human rights of the research participants. Any researcher needs to be aware of the ethical issues that relate to what is generally considered proper or improper in the conduct of scientific inquiry. 'What right has researchers to intervene in other people's lives?' is also a question that each researcher has to rationalise.

4.2   OBJECTIVITY

'Objectivity' is usually conceptualised in the literature as 'freedom from bias', which refers to reliable knowledge, checked and controlled, undistorted by personal bias and prejudice (Kvale, 1996:64). This definition implies that if good solid research is done, which has been systematically cross-checked and verified, then the data gathered can be considered as objective. Objectivity, however, can also denote the meaning of inter-subjectivity or 'doing justice to the object of study' (Smaling, 1992:307). Data must be intersubjectively testable and reproducible, in other words different observers should by ways of repeated observations of the same phenomena obtain the same information. Although one particular single interview and observation cannot be replicated, different researchers may, when following similar procedures, come up with closely similar information from the participants (Kvale, 1996:65). In this sense, objectivity may mean to reflect

the nature of the object under research, thus, letting the object 'speak'. Meanings like 'gaining trust' and 'establishing rapport' are used as means to gain objectivity.

Objectivity can further be understood as either that the researcher should be unbiased in his descriptions and interpretations, or that the researcher has to gain trust, establish rapport in order to get close to the study objects and to generate legitimate and truthful descriptions (Babbie & Mouton, 2001:273). In this study, the researcher will be respectful towards the participants and will attempt not to let the measuring instruments distort them in any way. The participants will also be allowed to speak freely without interruption.

The qualitative alternative to objectivity is 'confirmability', which refers to the degree to which the findings are the product of the focus of the inquiry and not of the bias of the researcher (Babbie & Mouton, 2001:278; De Vos, 2002:352). Lincoln and Guba (1985:290) removed the evaluation of the study from the researcher and place it on the data. Raw data, findings, analysis, interpretations, and recommendations were examined throughout this study in order to attest that it is supported by the data and thus internally coherent. This process was used to establish the confirmability of the study.

TABLE 4.1: TYPOLOGY TO MAXIMISE THE QUALITY OF DATA AND RESULTS
(Adapted from Babbie & Mouton, 2001:276; De Vos, 2002:352; Smaling, 1992:316)

Approach	
Quantitative	**Qualitative/PAR**
Objectivity	Confirmability

Validity:
 	
▪ External validity
  (Not applicable to this study)
▪ Internal validity
  ⇨ Content validity
  ⇨ Construct validity
	Validity:
	
	▪ Transferability
	
	▪ Trustworthiness
	▪ Credibility
	▪ Social validity

Reliability	Dependability
Triangulation ⟶	

4.3   VALIDITY

A distinction can be made between internal and external validity.

4.3.1 External validity

Within a quantitative paradigm, external validity, is concerned with the extent to which the research results can be generalised to the population or to other research groups not studied (Smaling, 1992:316). It embraces the concept of repeatability especially when referring to future repetition of the study in another context, target population or research field, called reproducibility or generalisability. This study does not claim external validity.

Within the qualitative paradigm, the alternative concept of 'transferential validity' is used, which means that the research results may be useful for other researchers who are either involved or interested in research of the same kind (in this case nutritional interventions for rural communities). Preconditions for transferential validity (also called transferability) are that the research report should contain an accurate description of the research process, that a logical argument for the choices of methods should be explicated and that the research situation and context should be portrayed in detail (Smaling, 1992:318). In a qualitative study, the obligation for demonstrating transferability rests on those who wish to apply it to the receiving context (Babbie & Mouton, 2001:277). Writings on this research study were transparent about the research process and it delivered arguments for all choices made. Dissemination of the process and the results obtained was done in as much detail as practically possible.

4.3.2 Internal validity

Internal validity is considered a conditional methodological requirement for every research study (Smaling, 1992:316) and specifically refers to the validity within the research study. Different approaches to validation can be distinguished in the literature. Three main categories are eminent: content, criterion and construct validity with the possibility of including a fourth category, namely face validity (Babbie & Mouton, 2001:122, 123; Delport, 2002:167; Smaling, 1992:314, 315).

This study claims a high degree of content and construct validity. Only these two assumptions are discussed, as well as measures taken to maximise it.

- Content validity – (sometimes called substantive validity) refers mostly to procedures and instruments and is concerned with the extent to which a measurement covers the range of meanings included in the concept or intended object of study (Babbie & Mouton, 2001:122-123; Delport, 2002:167; Smaling, 1992:314,315). The question usually asked is: 'how well does this instrument or procedure measure what we want it to measure?' (Delport, 2002:167). In this study a thorough literature study was done focusing on nutritional interventions, household food security, as well as hygiene and sanitation practices, which gave background to the broader design of the research study. The connotative meaning of all the concepts included in this study also relate to the research problem as well as the construction of measuring instruments. Content validity is also a judgmental process, which was done in this study by the involved study leaders and members of the research team.

- Construct validity – (sometimes called conceptual or concept validity) involves the degree to which an instrument successfully measures a theoretical construct. It is also described as the quality of the conceptualisation or operationalisation of the relevant concept, implied by the procedure (Smaling, 1992:315). Relevant questions that should be answered are usually: what does the instrument mean, what is it measuring; how and why does it operate the way it does? (Delport, 2002:167). Cook and Campbell (1979:64) also mentioned three threats to construct validity, namely: inadequate pre-operational explication of constructs, mono-operation bias and mono-method bias. In this study construct validity was strived for through precise explication of the constructs and employing different data collection methods. The outcomes of group discussions and observations were used to enhance the construct validity of this study as well as for triangulation purposes.

Validity of the results of a PAR study are gauged, first by the extent to which the new knowledge is applied to inform collective action and second by the degree to which a community moves towards the practice of a self-sustaining process of democratic learning and liberating action (Burkey, 2000:64). Other constructs that more accurately reflect assumptions within the qualitative paradigm are: 'trustworthiness, 'credibility' and 'social validity'.

Trustworthiness
The relevant question is simple: how can a researcher persuade others that the findings of an inquiry are worth paying attention to or worth taking note of? Greenwood and Levin (1998:81) use the term 'credibility', which according to them, refers to the arguments and the processes

necessary for having someone trust research results. Knowledge should be credible to the group generating it, as well as to external outsiders, not participating in the study. Communication processes are a vital component in creating trustworthy knowledge. Researchers should deliberately plan and structure ways for communication to take place that will effectively support an open and inclusive meaning process (Greenwood & Levin, 1998:114).

Trustworthiness was acquired through the following procedures of maximising credibility:

- Prolonged engagement – I terminated data gathering only when data saturation occurred
- Persistent observation – I pursued various viewpoints and approaches derived from the literature to describe the nutritional situation within the community
- Triangulation – data was gathered using different viewpoints, methods and techniques
- Referential adequacy – written tests, measuring scales, audio taped, transcribed discussions and completed observation schedules were available as documents of the research process and outcomes
- Peer debriefing – perceptions, insights, analyses and interpretations were shared with an acculturated colleague
- Member checks – the data, results and interpretations were taken back to the participants of the study.

Credibility

'Credibility' is also seen as an alternative to internal validity (De Vos, 2002:351; Lincoln & Guba, 1985:290). The goal is to demonstrate that the inquiry was conducted in such as manner, as to ensure that the subject was accurately identified and described. According to Smaling (1992:317), content validity in qualitative research (credibility) can be ensured by preparing a comprehensive register of data, notes of relevant events and the state of affairs. These notes should be studied on a regular basis in order to establish categories and the importance there-of to the research study. I therefore spend much time writing extensive field notes, which were also used as a measure of triangulation.

Social validity

Within PAR, another type of validation came under scrutiny, namely 'social validation' (Fals-Borda, 2000:8). This procedure involves validation of findings with all the participants. Analysed data was taken back to the participants to check whether that was actually what they had said and meant. It is also considered a rigorous process of 'checking the facts' with or by participants themselves.

Social verification was made possible in this study by using a dialogical method. This refers to testing the coherence of arguments being presented by means of activities such as dialogue, discussion, argumentation, and consensus (Reason, 1994:48). The measure of social verification also featured as part of triangulation.

4.4   RELIABILITY AND DEPENDABILITY

The notion of reliability is often associated with the concepts accuracy, consistency, stability and repeatability (Delport, 2002:168). However, according to Smaling (1992:311) these terms are not considered to be the core meaning of reliability but would rather curtail or alter the concept. The core meaning according to Smaling is the absence of random sources of error. In this sense, reliability is rather seen as 'dependability' (De Vos, 2002:352) and an aspect of methodological objectivity, because the striving for objectivity includes the avoidance of distortions.

Measures to obtain reliable results were as follows:

▪ Attributes relating to me (main facilitator/**researcher**) that could have an effect on data collection were the affiliation I belonged to (University of Pretoria) and differences with the participants in the study. Usually, when a researcher is from a respectable affiliation (like Universities and research organisations), participants are likely to be better motivated to participate and to be more truthful in their replies. Because most of the members of the research team in this study were affiliated with the University of Pretoria, this particular aspect did not presumably pose a serious problem to data collection. Racial and language differences did create a distance between the participants and me and did possibly lead to a significant degree of response bias. My unconscious prejudices, expectations, attitudes, opinions, and beliefs also could have influenced the final data. I had to be very careful not to let any orientation influence the participants, whether positively or negatively.

▪ All **participants** in a research study are usually aware of the situation and tend to react to it, a phenomenon known as reactivity or the Hawthorne effect (Mouton, 1996:141, 152). This reaction can manifest in resistance, supplying inaccurate information, stubbornness, or behaviour modification in order to create a better impression on or deliberately misleading the researcher. Memory decay or interview saturation can also be perplexing variables. Tiredness on the side of the researcher and participants and the motivation level of the participants could also influence the validity of the collected data. In this study, I made the data collection ordeal

as meaningful as possible by emphasising the benefits of the research study (and particularly the intervention part) to the community during all gatherings and doing it over an extended period of time (18 months).

- Reliability is a prerequisite for measuring validity. An **instrument** simply cannot measure accurately if it does not consistently produce similar readings. Within this study a standardised household food security scale was used, which enhanced the possibility of collecting reliable data in a quantitative sense. This scale was also pre-tested to ensure that the participants would truly understand the statements. Concerning the qualitative part of the research, a different, less technical approach was needed. One of the major concerns regarding measuring validity is to accurately identify the indigenous connotations of the subjects under study. Because the participants themselves generated these connotations, it was assumed that it was an accurate reflection of their world (Mouton, 1996:130).

- I also had to be sensitive towards the **research context** in order to avoid bias, especially relating to the incidence of poverty, hunger, unemployment and suffering. Local and cultural habits and customs were also taken into account when executing the research by being sensitive and non-judgemental. These customs related to the habits of drinking traditional beer on a frequent basis, eating with hands, appearing to be very inactive by sitting in the sun all day.

4.5   TRIANGULATION

The concept refers to the use of multiple methods to investigate the same research question. Triangulation looks for 'convergent validity', in which several methods give the same results. For example, anthropometrical measurements, analysis of blood samples, and clinical examination might all be used to determine that a person is malnourished. One can endeavour to achieve objectivity, validity and reliability in both quantitative and qualitative research with the aid of triangulation. The aim of triangulation is simply to study the object of research in at least two different ways (Smaling, 1992:319). Six 'types' can be distinguished, namely:
- Data triangulation – using two or more kinds of data sources
- Method triangulation – using two or more research methods/approaches
- Researcher triangulation – working together with other researchers
- Theoretical triangulation – elucidating research material

- Mental triangulation – establishing different ways of thinking and endeavour in diverse forms of role-playing
- Multiple triangulations – using more than one form of triangulation.

(Babbie & Mouton, 2001:275; Glaser & Strauss, 1999:108, 112).

Richardson (2000:934) proposed the term 'crystallisation' instead of 'triangulation', which is illustrated by looking at a crystal from various angles. It refers to a combination of *"symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities and angles of approach"*. In this study, however, the term 'triangulation' was still used.

Measures used for triangulation in this study were 'peer reviews', referring to the checking with fellow researchers whether the collected data or the interpretation there-of did not contain any random errors. 'Social verification' (Fals-Borda, 1991a:8) or 'member checks' (Smaling, 1992:313) was also used. Extensive field notes were an important measure, specifically within the qualitative paradigm. I kept two sets of notes – one for describing the environment in which the study was taking place and the other containing theoretical memos. These memos included observations, which were used to either contradict or enhance my original ideas, analyses and findings.

4.6   ETHICS AND POLITICS

"The right thing to do is not always evident. In many cases, what is right for me may not be right for other people. In some cases, doing the right thing might involve placing the greater good above specific benefits that might accrue to me. In many cases, ethical choices involve a trade-off or compromise between interest and rights of different parties" (Babbie & Mouton, 2001:520).

The above citation summarises ethical and political issues in research. Although the researcher has the right to search for true accounts of social phenomena, it cannot be done at the expense of the human rights of the research participants. Any researcher needs to be aware of the ethical issues that relate to what is generally considered proper or improper in the conduct of scientific inquiry. An in-depth discussion of all ethical issues is beyond the scope of this writing and attention was only given to aspects as it applied to the study.

4.6.1 Informed consent

No person was forced to participate in the research study. Although this norm is important, it must also be considered that participation in the study was important for behavioural change and community development to take place. In the light of this, community members were thus motivated to participate. The attention was on the motivation and I took care not to manipulate the participants in any way. The nature of the research study and all other implications at stake were also revealed in order to make the decision to participate an informed one. I communicated the aim and goals of the study, what exactly their participation would entail and how long it would take. I attempted to obtain appropriately, informed consent from prospective participants and to appropriately document it. Most participants were illiterate. The field worker, who could speak the local language, was asked to explain the procedures to the prospective participants. Participants also received incentives as sign of good will and as motivation for voluntarily participation.

4.6.2 Deceiving participants

Overt research was done, in other words I made my identity and the affiliation to which I belong known to the participants as well as to all other community members. There was no reason to deceive participants about the purpose of the study because no sensitive issues were at stake.

4.6.3 Privacy

The invasion of privacy was justified because the research outcomes would be published solely for academic purposes to an academic audience. Although these arguments could be challenged, it was my perspective and therefore it was sufficient. I did, however, not deliberately impose on the participants' privacy or persuade information in such a way that the participants were undignified. Anonymity of the participants could not be guaranteed, since they would be personally interviewed and observed and would become part of the research process. Personal or any sensitive information would however, not be made public. Identification numbers was used on the schedules and other instruments and a master identification file was created to link the numbers to the participant's name. This file would have only been used for legitimate purposes. Confidentiality could therefore be assured.

4.6.4 Harm

Not harming people in a social research context is easy in theory, but often more difficult in practice. Harm can be done as a result of the actual process of doing the research or through publication of the findings (Hammersley & Atkinson, 1996:268). This issue is of importance to the

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study because participants can be considered 'more vulnerable' to the process of research, because of their low socio-economic status and illiterate level. The issue of hunger was also a very stressful and sensitive matter. In case of change, the participants may be 'forced' to consider aspects of their lives, which they do not normally consider. There were scientific grounds for this study to be conducted, which reasonably outweighed possible harm to be done. At the most, I attempted to abide by the norm of not doing harm. I have been sensitive to any situation that might let the participants feel uncomfortable, but still meet the goal of effective pursuing of research.

4.6.5 Exploitation

Whether exploitation is taking place is always a matter of judgment. In this study, the problem of exploitation was intercepted in the way of empowering the community members (participants) to become part of the research process. The goal was also that participants should realise their problems and needs within their own situation.

4.6.6 Political issues

"The politics of research refers to the way in which the domains of science and politics meet and interact" (Babbie & Mouton, 2001:546).

A call was made by Government in 1993 to direct science in such a way that overall quality of life can be improved and by contributing to the reconstruction and development of the 'new' society (Babbie & Mouton, 2001:535, 536). This study did react to that call for science in South Africa to meet the socio-economic needs of the post-apartheid society. Political issues were definitely at stake within this study and need further elaboration. It is my view that scientific knowledge entails an intervention in the social world, and that it is not merely an intellectual and speculative pursuit. This viewpoint can be termed 'strong interventionism' (Babbie & Mouton, 2001:537). Strong interventionism goes beyond the point of only producing knowledge. It also involves taking steps to use the knowledge actively by intervening in the lives of the participants. At the extreme point of strong interventionism, involvement with the participants might change into activism, which was definitely not the intention of this research study.

4.6.7 Personal commitment

I was committed to any possible ethical obligation towards the community members involved in the study as well as towards the scientific community. The implications were that all findings (whether it be positive or negative) were revealed, results were not misrepresented in any way, data was not

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fabricated, and all contributions and sources were acknowledged. Shortcomings, limitations, and failures of the study were also made known when presenting the results. The findings were also reported in an open, complete and timely fashion to the scientific community.

4.6.8 Personal endowment

I considered myself well equipped to execute the study in terms of experience and knowledge. I was employed with the Department of Health for six years, being involved in community nutrition and public health projects on national, provincial and district level. I also obtained a Masters degree in Dietetics with emphasis on nutrition education and behavioural change. A particular nutrition education model was contracted as part of the thesis. I also attended a myriad of courses and workshops relevant to this study field (e.g. project management, group facilitation). Literature studies were also performed as part of the course work of this thesis on adult education practices and evaluation models suitable for nutritional interventions.

4.7   CONCLUSION

This chapter summarised all the issues that were considered and executed in an attempt to enhance the quality of the data gathered and results obtained to the best of the research team's ability. The study also received institutionalised support by the ethical committee of the Faculty of Natural and Agricultural Sciences in the University of Pretoria. This committee reviewed the research proposal and ensured that the rights and interests of the research participants were protected.

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