

CHAPTER 3

Research methodology

3.1 INTRODUCTION

In this chapter the research methodology used in the study is described. The geographical area where the study was conducted, the study design and the population and sample are described. The instrument used to collect the data, including methods implemented to maintain validity and reliability of the instrument, are described.

3.2 RESEARCH APPROACH AND DESIGN

A quantitative approach was followed. Burns and Grove (1993:777) define quantitative research as a formal, objective, systematic process to describe and test relationships and examine cause and effect interactions among variables. Surveys may be used for descriptive, explanatory and exploratory research. A descriptive survey design was used. A survey is used to collect original data for describing a population too large to observe directly (Mouton 1996:232). A survey obtains information from a sample of people by means of self-report, that is, the people respond to a series of questions posed by the investigator (Polit & Hungler 1993:148). In this study the information was collected through self-administered questionnaires distributed personally to the subjects by the researcher.

A descriptive survey was selected because it provides an accurate portrayal or account of the characteristics, for example behaviour, opinions, abilities, beliefs, and knowledge of a particular individual, situation or group. This design was chosen to meet the objectives of the study, namely to determine the knowledge and views of patients and family members with regard to diabetes mellitus and its treatment regimen (Burns & Grove 1993:29).

3.3 RESEARCH SETTING

The study was conducted at Nkhensani Hospital and Giyani Health Centre which fall under the Lowveld Region, Mopani District in the Limpopo Province (RSA). The hospital has an average bed occupancy of 253. It caters for the health needs of people who are referred to it from 20 clinics. The majority of the clients are black. Giyani Health Centre has a bed occupancy of 10 and is 2.5 km south-east of Nkhensani Hospital. It refers its clients to Nkhensani.

3.4 THE STUDY POPULATION AND SAMPLE

According to Burns and Grove (1993:779), a population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study. The study population consisted of all adult diabetic patients and their living-in family members in the Mopani District who utilise the Nkhensani Hospital and Giyani Health Centre.

A convenient sample of 64 subjects was selected from the two institutions. Mouton (1996:132) defines a sample as elements selected with the intention of finding out something about the total population from which they are taken. A convenient sample consists of subjects included in the study because they happen to be in the right place at the right time (Polit & Hungler 1993:176). The sample included 32 diabetic patients and 32 family members. Available subjects were entered into the study until a sample size of 64 was reached. Subjects who met the sample criteria were identified by the researcher at the Giyani Health Centre and in the wards and outpatients department of the Nkhensani Hospital.

The sample size of 32 patients and 32 family members were the total of subjects who were willing to participate in the research and who met the sampling criteria during the six-month period of data collection.

3.4.1 The sampling criteria

Subjects included in the sample were selected to meet specific criteria. The diabetic patients had to meet the following criteria to be included in the sample.

They should:

- have had the disease for at least 5 years or more
- be mentally sound in order to consent to participation
- be willing to participate
- be 16 years or older
- obtain the consent of parents/guardians to participate if they are less than 18 years of age
- be of either sex or any race

The family members of the diabetic patients had to meet the following criteria to be included in the sample.

They should be:

- living with the diabetic patient

- mentally sound
- willing to participate
- 16 years or older
- of either sex or any race

3.5 DATA COLLECTION

3.5.1 Data collection instrument

A questionnaire was chosen as data collection instrument. A questionnaire is a printed self-report form designed to elicit information that can be obtained through the written responses of the subjects. The information obtained through a questionnaire is similar to that obtained by an interview, but the questions tend to have less depth (Burns & Grove 1993:368).

Data was collected with the aid of questionnaires to evaluate the patients' and family members' knowledge and views on diabetes mellitus. Questionnaires were decided upon because of the following:

- They ensured a high response rate as the questionnaires were distributed to respondents to complete and were collected personally by the researcher.
- They required less time and energy to administer.
- They offered the possibility of anonymity because subjects' names were not required on the completed questionnaires.
- There was less opportunity for bias as they were presented in a consistent manner.
- Most of the items in the questionnaires were closed, which made it easier to compare the responses to each item.

Apart from the advantages that have been listed above, questionnaires have their weaknesses; for example, there is the question of validity and accuracy (Burns & Grove 1993:368). The subjects might not reflect their true opinions but might answer what they think will please the researcher, and valuable information may be lost as answers are usually brief.

Two questionnaires were used to collect the data. One was for the diabetic patients and the other one for family members or relatives of the patients. The questionnaires consisted mostly of closed-ended questions and a few open-ended questions, as these provide more diverse detail. In the open-ended questions, the subjects were required to respond in writing, whereas closed-ended questions had options which were determined by the researcher (Burns & Grove 1993:370). Open-ended questions were included because

they allow subjects to respond to questions in their own words and provide more detail. Closed-ended questions were included because they are easier to administer and to analyse. They are also more efficient in the sense that a respondent is able to complete more closed-ended items than open-ended items in a given period of time (Polit & Hungler 1993:203).

The questionnaires were in both English and Xitsonga to enable those who did not understand English to complete them in Xitsonga. For the two who could not read or write, the researcher read and wrote their answers for them. They were given the assurance that the answers would not be able to link their responses to them at the stage of data analysis, therefore ensuring anonymity. The questionnaires consisted of sections A and B. Section A aimed at gaining demographic data such as age, level of education, income and gender. This information could assist the researcher when interpreting the results, for example, whether subjects lacked knowledge of diabetes mellitus because they were uneducated, or whether they did not follow the prescribed treatment regimen due to lack of money.

The researcher collected all the information from the patients and family members. Section B aimed at determining the knowledge and views of patients and family members on diabetes mellitus and its treatment regimen. Questions assessing knowledge about diet, medication, exercise, foot care and problems experienced were included. Instruction guidelines were attached to the questionnaires to guide the subjects as to whether to circle or tick the chosen response.

3.5.2 Data collection procedure

Questionnaires were personally distributed by the researcher to patients and their family members to complete. The researcher completed two questionnaires for those who couldn't read. The data was collected over a period of six months. The researcher found some patients in the wards where they were admitted and their family members were found there during visiting times. Some of the patients were found in the out-patients department together with their family members, and others at the health centre.

3.6 RELIABILITY AND VALIDITY

3.6.1 Reliability

Polit and Hungler (1993:445) refer to reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. The two questionnaires which were answered by both groups, the diabetic patients and the family members, revealed consistency in responses. Reliability can also be ensured by minimising sources of measurement error like data collector bias. Data collector bias

was minimised by the researcher's being the only one to administer the questionnaires, and standardising conditions such as exhibiting similar personal attributes to all respondents, e.g., friendliness and support. The physical and psychological environment where data was collected was made comfortable by ensuring privacy, confidentiality and general physical comfort.

The subjects were offered comfortable chairs in the side ward. Windows were opened for fresh air. The researcher remained in the ward with the subjects. A "do not disturb" notice was placed on the door to maintain privacy and prevent interruptions. Subjects were requested not to write their names on the questionnaires to ensure confidentiality.

3.6.2 Validity

The validity of an instrument is the degree to which an instrument measures what it is intended to measure (Polit & Hungler 1993:448). Content validity refers to the extent to which an instrument represents the factors under study. To achieve content validity, questionnaires included a variety of questions on the knowledge of patients and their family members about diabetes mellitus and its treatment regimen (Polit & Hungler 1993:250).

Questions were based on information gathered during the literature review to ensure that they were representative of what patients should know about diabetes mellitus and its treatment. Content validity was further ensured by consistency in administering the questionnaires. All questionnaires were distributed to subjects by the researcher personally. The questions were formulated in simple language for clarity and ease of understanding. Clear instructions were given to the subjects and the researcher completed the questionnaires for those subjects who could not read.

All the subjects completed the questionnaires in the presence of the researcher. This was done to prevent subjects from giving questionnaires to other people to complete on their behalf. For validation, the questionnaires were submitted to a researcher and statistician at Unisa. As a result more questions were added to ensure higher representativeness. Rephrasing of some questions was done to clarify the questions and more appropriate alternative response choices were added to the closed-ended questions to provide for meaningful data analysis (Burns & Grove 1993:373).

External validity was ensured. Burns and Grove (1993:270) refer to external validity as the extent to which study findings can be generalised beyond the sample used. All the persons approached to participate in the study completed the questionnaires. No single person who was approached refused to participate. Generalising the findings to all members of the population is therefore justified.

Seeking subjects who are willing to participate in a study can be difficult, particularly if the study requires extensive amounts of time or other types of investment by subjects. If the number of the persons approached to participate in a study declines, generalising the findings to all members of a population is not easy to justify. The study needs to be planned to limit the investment demands on subjects in order to increase participation.

The number of persons who were approached and refused to participate in the study should be reported so that threats to external validity can be judged. As the percentage of those who decline to participate increases, external validity decreases (Burns & Grove 1993:270).

3.7 PRETESTING THE QUESTIONNAIRE

A pretest refers to a trial administration of an instrument to identify flaws. When a questionnaire is used as a data gathering instrument, it is necessary to determine whether questions and directions are clear to subjects and whether they understand what is required from them. This is referred to as the pretesting of a questionnaire (Polit & Hungler 1995:38, 711).

The researcher pretested the questionnaire on six respondents meeting the set criteria at Giyani Health Centre, three patients and three family members. All of them answered the questions and no single question was changed following the pretest.

3.8 ETHICAL CONSIDERATIONS

The conducting of research requires not only expertise and diligence, but also honesty and integrity. This is done to recognise and protect the rights of human subjects. To render the study ethical, the rights to **self-determination, anonymity, confidentiality** and **informed consent** were observed.

Written permission to conduct the research study was obtained from the Department of Advanced Nursing Sciences' Research Committee at Unisa, the Research Committee of the Department of Health and Welfare of Limpopo's provincial office and the Assistant Director of Nkhensani Hospital (see annexures 1 and 2). Verbal permission was obtained from the persons in charge of the Adult Medical and Surgical Wards (Nkhensani Hospital) and Giyani Health Centre.

Subjects' consent was obtained before they completed the questionnaires. Burns and Grove (1993:776) define **informed consent** as the prospective subject's agreement to participate voluntarily in a study, which is reached after assimilation of essential information about the study. The subjects were informed of their

rights to voluntarily consent or decline to participate, and to withdraw participation at any time without penalty.

Subjects were informed about the purpose of the study, the procedures that would be used to collect the data, and assured that there were no potential risks or costs involved.

Anonymity and **confidentiality** were maintained throughout the study. Burns and Grove (1993:762) define anonymity as when subjects cannot be linked, even by the researcher, with his or her individual responses. In this study **anonymity** was ensured by not disclosing the patient's name on the questionnaire and research reports and detaching the written consent from the questionnaire.

When subjects are promised **confidentiality** it means that the information they provide will not be publicly reported in a way which identifies them (Polit & Hungler 1995:139). In this study, **confidentiality** was maintained by keeping the collected data confidential and not revealing the subjects' identities when reporting or publishing the study (Burns & Grove 1993:99). No identifying information was entered onto the questionnaires, and questionnaires were only numbered after data was collected (Polit & Hungler 1995:139).

The ethical principle of **self-determination** was also maintained. Subjects were treated as autonomous agents by informing them about the study and allowing them to voluntarily choose to participate or not. Lastly, information was provided about the researcher in the event of further questions or complaints.

Scientific honesty is regarded as a very important ethical responsibility when conducting research. Dishonest conduct includes manipulation of design and methods, and retention or manipulation of data (Brink 1996:47). The researcher tried to avoid any form of dishonesty by recording truthfully the answers of those subjects who could not read or write. Manipulation of data could not be done as the supervisor and an independent statistician entered the data from the questionnaires into the SPSS computer software programme.

The statistician produced the results independently of the researcher to avoid subjective collaboration. The open-ended questions which were analysed by the researcher were also checked by the supervisor for confirmation of credibility.

3.9 DATA ANALYSIS

After the data was collected it was organised and analysed. For analysis of closed-ended questions, a computer programme called Statistical Package for Social Sciences (SPSS) was used. Data was analysed by using descriptive statistics. Frequency tables were drawn and from these the data was presented in pie diagrams and bar graphs. The open-ended questions were analysed through quantitative content analysis by the researcher with the aim of quantifying emerging characteristics and concepts. Concept analysis is the process of analysing verbal or written communications in a systematic way to measure variables quantitatively (Polit & Hungler 1995:209, 698).

3.10 CONCLUSION

The researcher used a quantitative, descriptive survey design. Two questionnaires were administered by the researcher herself to collect the data from a convenient sample of 64 subjects. The questionnaires had both closed and open-ended questions. The sample characteristics included adults who were mentally sound and had had diabetes mellitus for at least 5 years, and were willing to participate, as well as family members living with diabetic patients.

Permission was obtained from the Limpopo government as well as Nkhensani Hospital. Consent was obtained from the subjects themselves. Anonymity, self-determination and confidentiality were ensured during administration of the questionnaires and report writing. Questionnaires were distributed to subjects to ensure validity. Reliability and validity were further increased by pretesting the questionnaire.

This chapter described the research methodology, including the population, sample, data collection instruments as well as strategies used to ensure the ethical standards, reliability and validity of the study.