

# CHAPTER 1

## INTRODUCTION, STATEMENT OF PROBLEM AND AIM OF STUDY

### 1.1 INTRODUCTION

#### **“DIABETIC, WE DIDN’T KNOW YOU WERE THERE” (Van den Aardweg, 1973:1)**

When entering a child’s world, one realises a child never exists in isolation. Children are an integral part of the community where there are interdependent relationships between friends, family, teachers and the school. These relationships are irreplaceable for children. Every individual has something to contribute to another individual or group, even though it may not yet have been mobilised.

The family is the basic source of security and support and the springboard for the physical, emotional, cognitive, moral and social development of children (Donald, Lazarus & Lolwana, 1999:184). The family gives guidance about personal values and social behaviour. The family helps to develop positive interpersonal relationships and provides an environment that encourages learning both in the home and in school (Schor, 1995:287).

Children tend to select friends who are like them in a variety of ways. Friends make one another feel important and special, and create a desire to spend time together (Cole & Cole, 2001:580). Friends are able to enter into and sustain relationships by making connections with other individuals, establishing common ground, balancing their interests and providing support in times of need (Hatch, 1997:70).

For children, school is more than just a place where they acquire knowledge and skills. It is also a place where children meet new friends, discover how to interact with other children and their teachers, experience success and failure, have expectations about themselves and others, and learn about themselves. Children learn many important social skills and behaviour at school, including sharing and empathy. They gain an understanding of rules, and how to deal with peer pressure. During their school years, children want to be accepted by their peers. They want to look and behave like their classmates and participate in the same activities. Their self-image and self-confidence are influenced by whether they are accepted or not (Schor, 1995:531).

In the White Paper on special needs education (RSA, 2001:7) the Ministry of Education states that there is a broad range of learning needs among the learner population. Where these needs are not met, learners may fail to learn effectively or be excluded from the learning system. In this regard, different learning needs arise from a variety of factors, such as physical, mental, sensory, neurological and developmental impairments, psycho-social disturbances, differences in intellectual ability, a particular life experience or socio-economic deprivation.

Rosenthal-Malek and Greenspan (1999:39) argue that to meet the physical and psychological needs as well as the federal mandates for learners with diabetes (who are regarded as health-impaired), teachers need to know the basic elements of the illness, the general aspects of the medical management of the illness, the best way to work with parents, and the best approach to including the child into the classroom routine. According to Thies (1999:393) children who are health-impaired may have limited strength, vitality or alertness due to chronic or acute health problems such as heart conditions, tuberculosis, rheumatic fever, nephritis, asthma,

sickle cell anaemia, haemophilia, epilepsy, lead poisoning, leukaemia and diabetes which adversely affect a child's educational performance. The young people who deal best with the stress of these illnesses seem to be those who have the inner resources of intelligence and adaptable temperament, whose parents have high self-esteem, good mental health and a positive belief in health care, and who also have a strong support network (Papalia & Wendkos Olds, 1996: 445).

It should be noted that the school is not only an education institution but is also part of the community. Each community has a number of diabetic learners who attend school. Donald, *et al.* (1999:36) view the individual in interactive relationship with different levels of organisation in the social context. Each of these levels can be seen as interacting with (influencing and being influenced by) other levels in the total ecological system. White and Wehlage (1995:23) emphasise that the teacher is a community educator and involved in community development. Collaboration between the school and the community is intended to provide a more holistic, comprehensive and effective set of responses to learners whose problems tend to be complex and multifaceted. This collaboration could help to build the knowledge and understanding that would support learners with diabetes (White & Wehlage 1995:26).

Perrin, Shayne and Bloom (1993:43) emphasise that schools fill both education and socialisation needs and are the link between other community activities that integrate the child into community life. Children are strongly influenced by the models they see around them. Communities in South Africa differ widely in terms of resources and values. Each community has certain values, attitudes and ways of seeing things, which can influence the development of the children in the community (Donald, *et al.* 1999:181).

## **1.2 REASON FOR THE CHOICE OF THE STUDY**

The researcher has been a secondary school teacher for the past fourteen years. During this period there were several learners with diabetes in the school, and many teachers expressed a need for knowledge and greater understanding of the learner with diabetes. They also wished to know how best to improve and maintain the relationship between the school, teachers and parents of the learners with diabetes.

Only a limited number of studies on learners with diabetes have been done in South Africa. As far as could be ascertained in the present study, the following studies on diabetes mellitus and education were completed between 1973 and 1998: *A psychopedagogical study of diabetes mellitus in secondary school pupils* (Van den Aardweg, 1973); *The young diabetic in career and employment* (Van den Aardweg, 1975); *The diabetic diet: education, compliance and practical applications* (Smith, 1983); *The diabetic personality* (Naud, 1990); *Stress and coping in families with diabetic children* (Corna, 1992); *The psychological aspects involved in white children with type I diabetes mellitus* (Struwig-Scholtz, 1995); *A critical review of education for diabetic adults in the Mafikeng, Mmabatho area of the North West Province: are there messages for health education?* (Direko, 1997); *The experience world of the adolescent with diabetes mellitus, with reference to the supporting role of the family* (Badenhorst, 1998); and *Glycaemia control and educational status of insulin-dependent diabetics following an educational programme in nursing* (Harrison, 1990).

Most of the available research referred to in this study was done in other countries. The aim of the present research study is to attempt to contribute to a better understanding of the learner with type I diabetes in the foundation phase of school, in the South African context.

This in-depth study was selected because of its topicality, significance and complexity.

Goleman (1997:xv) notes that the most influential early developmental psychologists, such as Piaget, focused on cognitive development, setting the early research agenda for that field of study. In recent years, research into child development has expanded its scope to study the unfolding of children's social and emotional lives. The result has been a new understanding of what makes a child socially adept or better able to regulate emotional distress.

Children in primary school will probably accept a classmate who has diabetes mellitus. They are likely to show more interest in why he or she is allowed to eat in class when they are not, and when given an explanation will be quite solicitous towards their friend. Their perception of the condition may be that the child has developed diabetes because he/she has done something wrong, they may even wonder if diabetes means that he/she will die, and they need to be told that it is not contagious (Ingersoll & Golden, 1995:450).

Learning always involves feelings and those feelings are experienced as much by the teacher as by the learner (Saarni, 1997:35). Van den Aardweg (1973:11) notes that the diabetic learner often passes unnoticed, unrecognised, with no help or understanding in the school. The primary cause of this neglect is ignorance, as the majority of teachers have little or no knowledge of diabetes and do not know the implications that such a disorder has for a learner. If the teacher were to understand the effect of diabetes on the learner and adopt a positive attitude towards the child, this would help to maintain the stability of the learner with diabetes.

The school and teachers need to understand how diabetes affects a learner's ability to function effectively in the classroom. A nine-year old learner described how he felt when his blood sugar was low: "I feel weak, irritable, hungry, and ready to kill anybody that bothers me." A thirteen-year old said: "It feels very weird. Sometimes I don't even know I am high. When I do think I am high, I feel like I am going to throw up, and I feel like I need to drink every 5 seconds or go to the bathroom" (Rosenthal-Malek & Greenspan, 1999:39).

According to Frieman and Settel (1994:196) chronic illnesses such as asthma, diabetes, epilepsy and sickle cell anaemia afflict a large number of children. A chronic illness may be defined as a medical condition that requires continued treatment. Considering the large number of chronically ill children, most teachers will probably, at some point in their careers, work with one or more of these learners in the classroom. Although most teachers encounter these learners, studies indicate that the teachers do not believe they have adequate information about chronic illnesses. Teachers need to be well informed so that they can more effectively meet the needs of the chronically ill learner. They need to learn the best ways of working with parents, the basic elements of the particular chronic illness, the relevant aspects of the medical management of the illness and the best approach to including the learner in the classroom (Frieman & Settel, 1994: 196).

The American Diabetic Association argues that children with diabetes require medical care to remain healthy. The need for medical care does not cease while the child is at school (American Diabetic Association, 1999:1). Appropriate diabetes care in the school is

necessary for the learner's long-term well-being and optimal academic performance. There is a significant link between blood glucose control and the later development of complications from diabetes. The school and teachers ought to have an understanding of diabetes and its management to facilitate the appropriate care of the learner with diabetes. Knowledgeable teachers are essential if the learner is to achieve the good metabolic control required to decrease the risk of developing serious complications from diabetes (American Diabetic Association, 2000:1).

Frieman and Settel (1994:197) note that basic knowledge of the learner's illness process and relevant aspects of medical management are necessary for effectively meeting the developmental and learning needs of a chronically ill learner. With this information the school and teacher will not only be able to teach the other learners in the class about the illness, but will also be prepared to meet the diabetic learner's medical needs in the classroom. If the teacher is not completely comfortable about handling the learner's medical condition, however, medical assistance should be summoned immediately if a crisis occurs. The teacher can therefore play an important role in the classroom as an asset builder in the development of learners with diabetes.

Rosenthal-Malek and Greenspan (1999:40) argue that although everyone has heard of diabetes, and many think they understand the illness, there are still many classic misconceptions about the manifestations of the symptoms and their effect on learning and the child's behaviour in the classroom. Some of the misconceptions are that the learner will tell you when his or her blood sugar is either too high or too low, diabetes is affected only by food intake, and if a learner eats properly, the diabetes will remain under control and bathroom and other privileges can wait a few minutes. Only with knowledge and understanding of diabetes can the misconceptions about a diabetic child's development, learning and behaviour be eliminated.

Thies (1999:393) points out learners with chronic health conditions are at the intersection of the health system and educational system, which traditionally operate in separate realms with different policies and philosophies. The chronically ill learner's health, developmental and learning needs are often not well integrated at school, reflecting this separation. School, teachers and family often do not discuss the impact of a learner's health condition on his/her ability to learn. When learners are acutely ill, academic achievement is seldom perceived as a priority but when the same learners seem to be well, health is not perceived as a factor in their education. It is seldom clear who bears the responsibility for addressing the actual or potential impact of a health condition on learning.

The child with diabetes mellitus is a chronically ill learner. The illness will not go away, it is a permanent factor in the learner's life. The learner has to take eventual responsibility for managing his/her illness. Friends, family, the school, church, teachers and the community should play an important role in these learners' lives.

### **1.3 AIM OF STUDY**

The proposal is that an in-depth study should be done to understand the learner with type I diabetes in the foundation phase.

The aims of this study are as follows:

- To identify the developmental and learning needs and the assets of learners with diabetes in the foundation phase.
- To provide knowledge and understanding of learners with type I diabetes in the foundation phase.
- To rally friends, family, school, teachers and the community to become external and internal asset builders in the development of the learner with type I diabetes in the foundation phase.

### **1.4 STATEMENT OF THE PROBLEM**

In order to understand the learner with type I diabetes in the foundation phase, the following research question was investigated:

What are the developmental and learning needs and the assets of the learner with type I diabetes in the foundation phase?

### **1.5 THEORETICAL FRAMEWORK OF THE STUDY**

The ecological perspective was viewed as an appropriate framework within which to contextualise this study. This approach emphasises the multiple contextual influences on human behaviour and the concept of reciprocity between the individual and the environment.

The ecosystemic perspective has evolved from a blend of ecological and systemic theories. Its main concern is to show how individual people and groups at different levels of the social context are linked in dynamic, interdependent and interacting relationships (Donald, *et al.* 1999:34).

Ecological theory is based on the interdependence and relationships between different organisms and their physical environment. These relationships are seen holistically. Every party is as important as another in sustaining the cycle of birth and death, regeneration and decay, which together ensure the survival of the whole. Figure 1.1 presents a way of viewing these relationships (Donald, *et al.* 1999:35).



[Figure not available ]

Figure 1.1 Interacting levels of organisation within the social context  
(Adapted from Donald, *et al.* 1999:35).

Figure 1.1 is based on the idea that the individual interacts in relationships with different levels of organisation in a social context. Each of these levels can be seen as interacting with (influencing and being influenced by) other levels in the total ecological system (Donald, *et al.* 1999:36).

According to Kapp (1991:13) the ecological perspective presents a school of thought, which stands in direct opposition to the medical or clinical paradigm. Instead of placing the emphasis on the child who has a certain deficiency, the child is studied in a certain ecological context. The ecology is considered to be of particular importance because it may eliminate or intensify a child's problems. The learner with diabetes is a good example of this ecological context. In an uncomplicated ecosystem he/she is able to comply with all the requirements of his/her environment and can pass as "normal". By contrast, in a complex environment where he/she is expected to have or to learn physical, emotional, social, moral and cognitive skills, he/she could be labelled "ill" and "abnormal".

Neisser's (cited in Saarni, 1997) notion of the ecological self is premised on the way we perceive our environment in terms of what opportunities it gives us for interaction. The ecological self is much like the subjective self in that the emphasis is on the individual engaged in transaction with those features of the environment that permit or afford interaction. The ecological self is also significant for the development of emotional competence because of its emphasis on the self in relation to an environment. Obviously the environment includes other people, such as friends, family, the school, teachers and the community, which means that the social environment can also be regarded as presenting an array of opportunities for interaction to the individual. This becomes deeply interesting in a classroom where the individual learners may differ in their assumptions of how social relations are defined and how assets are being used (Saarni, 1997:42).

The ecosystemic perspective has particular relevance for the following:

- Understanding the development of children in more holistic and interactive terms
- Understanding the classroom and school by viewing these as systems within the social context
- Understanding how the origins, maintenance and solutions to social problems and special needs cannot be separated from the broader context and systems within which they occur (Donald, *et al.* 1999:39).

It was also important for the purposes of this study to have a holistic view of the learner with type I diabetes in the foundation phase. The research question and aims of the study required adopting a needs-based and asset-based approach. Firstly, the needs-based approach was important in that it focused on the problems, deficiencies and needs of the learner with type I diabetes in the foundation phase (Ebersöhn & Eloff, 2003, 5). The needs assessment done in this study provides legitimacy for support without labelling the learner with type I diabetes in the foundation phase or blinding friends, family, school, teachers and the community to the capacities of these learners (Ebersöhn & Eloff, 2003,6). Secondly, the learner's external and internal assets could help the child thrive in spite of being chronically ill with diabetes. However it would not be possible to build these assets without the support of the learner's family, friends, teachers, the school and the community.

Every individual has needs and shortcomings. Every individual, every family, every classroom setting, school or learning environment also has a unique combination of assets and capacities. Every individual has something to contribute, even though it may not yet have been mobilised. In every ecosystem there are resources available that are still unacknowledged. Effective living depends on whether those capacities can be used, these abilities expressed and these gifts shared. If they are, the individuals will be valued, will feel powerful and connected to the people around him or her (Ebersöhn & Eloff, 2003:9).

The asset-based approach focuses on what is currently present in the environment. It sets out to identify the capacities inherent in individuals in their environment. It does not start out by determining what is absent or problematic. It has a strong internal focus, which means that problem solving and mission development should come from within. The asset-based approach is relationship-driven and should be based on the strengths and talents (assets) of the individuals involved, and not on their weaknesses and problems. Relationships should be built and rebuilt constantly (Ebersöhn & Eloff, 2003:10).

Every child is unique. Children are comfortable being themselves. Roehlkepartain and Leffert (2000:8) note that children have meaningful ways to spend their time and many opportunities to explore and learn. They have positive values, social skills and a positive identity. They have developmental assets and people in their lives who help them build and strengthen their assets.

Roehlkepartain and Leffert (cited in Briedenhann, 2003:28) mention the effect of assets on young children as follows: "Those who have many assets when they are young are more likely to hang on to them as they grow" (Briedenhann, 2003:28). The more assets young children have the more likely they are to grow up doing positive things that the community values (Roehlkepartain & Leffert, 2000:8).

The relationship between the child and his ecology should be taken in account to identify the needs and assets of the learner with diabetes in the foundation phase. These learners' environment is relationship-driven and includes other people such as friends, family, the school and teachers, which form a community. They are part of a joint effort to provide understanding and support for the diabetic learner. They can also help to identify capacities and build his/her assets to promote healthy and effective development and learning.

## 1.6 RESEARCH DESIGN AND METHODOLOGY

This study is qualitative in nature. It is an ethnographic study using case studies. The unit of study is the foundation phase learner with type I diabetes.

The research was based on the interpretative paradigm characterised by a concern for the individual (Cohen, Manion & Morrison, 2002:22).

Qualitative research concerns the context, human experiences and situations of the individuals being studied. The research takes place in a natural setting where the learner with type I diabetes in the foundation phase is studied holistically, taking in account all factors and influences in the given situation (Ary, Cheser, Jacobs & Razavieh, 2002: 424).

An ethnographic study is characterised by its socio-cultural interpretation. Gray and Airasian (2003:166) assert that ethnography is one of the best-established qualitative research approaches. They explain ethnography as follows: "It seeks to describe and analyse all or part of the culture of a community by identifying and describing the participant's practices and beliefs" (Gray & Airasian, 2003:166).

The purpose of the case studies was to collect detailed information from a small group of learners with type I diabetes in the foundation phase. Based on these case studies, conclusions were drawn, but only about the participants and only in this particular context. By using case studies to identify the needs and assets of learners with type I diabetes in the foundation phase, the researcher endeavoured to give a more holistic interpretation of the findings obtained in the qualitative research.

Haslam and McGarty (1998:55) define a case study as "research (usually quite intensive) that involves a single participant or group of participants" (Haslam & McGarty, 1998:55). Case studies provide a real example of real people in real situations. They investigate and report on the complex and unfolding interactions of human relationships in a unique instance (Cohen, *et al.* 2002:181).

Yin (cited in Cohen, *et al.* 2002) identifies three types of case studies in terms of their outcomes: exploratory, descriptive and explanatory case studies. For the purpose of this study the descriptive case study was used for providing narrative accounts.

The research data were collected in four phases:

- Phase one consisted of an exploratory interview followed by compiling a letter and questionnaires.
- Phase two consisted of administering three questionnaires that were completed by the participants' parents, teachers and the participants in collaboration with the researcher. The information from the questionnaires formed the basis of the semi-structured interviews
- Phase three consisted of semi-structured interviews conducted with the participants' parents as well as the participants. The interviews were semi-structured as the completed questionnaires formed the basis of the discussion.
- Phase four consisted of semi-structured interviews conducted with the teachers of the participating learners with diabetes.



Data analysis took place simultaneously through a process of inductive data analysis (Ary, *et al.* 2002: 425). The data were interpreted by means of a narrative approach through which people describe their worlds (Silverman, 2000:122).

The semi-structured interviews were recorded on audiotape and transcribed, after which the data were coded and analysed.

## **1.7 DESCRIPTION OF THE RESEARCH POPULATION, SAMPLING METHODS AND LIMITATIONS**

The unit of study for the research was learners with type I diabetes in the foundation phase. The names of the participants were obtained from the Ferncrest Diabetic Clinic at Rustenburg in the North West Province. The participants were between seven and nine years old.

The participants were selected on the basis of non-probability samples. This method involves non-random procedures for selecting the members of the sample (Ary, *et al.* 2002: 169).

Through purposive sampling, as a type of non-probability sample, the researcher selected a case because it illustrated some feature or process of interest. The samples were carefully selected to comprise only learners with type I diabetes in the foundation phase, aged between seven and nine years (Silverman, 2000:104).

Permission to conduct the research was obtained in writing from the parents of the participants, and all possible information was given about the goal of the study and the procedures followed during the study.

For the purpose of this study the following ethical aspects were taken into consideration (Ary, *et al.* 2002:437-438):

- The researcher should communicate the aims of the investigation to the learners, their parents and the teachers involved.
- Participants should give their informed consent before participating in the research.
- Honesty should characterise the relationship between the researcher and the participants.
- Participants would have the right to withdraw from the study at any time.
- The researcher would be mindful of cultural, religious and gender differences in the planning, conducting and reporting of the research.
- The researcher should communicate the findings and significance of the research to the participants.
- The participants would have the right to remain anonymous.

The research setting was the Ferncrest Diabetic Clinic in Rustenburg in the North West province. According to Bender (2002:16) all participants have to be assured that any data collected from them would be kept confidential. All participants in the study had the right to withdraw from the study or to request that data collected about them should not be used.

The possible limitations of the research are that it might not be possible to generalise the findings of the case studies. Case studies are not a tool for testing hypotheses but rather for producing a hypothesis which can then be tested through rigorous investigation. The

primary aim of case studies is to gain knowledge (Ary, *et al.* 2002:441). Another limitation of the case study is that the findings it produces may be unreliable because they are peculiar to the particular case being studied (Haslam & McGarty, 1998:55). To increase the validity of the research, more than one case study was conducted.

Other limitations of the research might be the lack of participation by learners and parents and the small number of learners diagnosed with type I diabetes in the age group of seven to nine years.

## **1.8 DEFINITION OF KEY CONCEPTS**

To establish the developmental and learning needs and the assets of the learner with type I diabetes in the foundation phase, the following key concepts are discussed below.

### **1.8.1 Foundation phase learner**

The foundation phase learner is part of a comprehensive approach to children from birth to nine years of age with the active participation of their parents and caregivers. The purpose of this approach is to protect the child's right to develop his/her full cognitive, emotional, social and physical potential (RSA, 2001:14). The foundation phase learner is part of the umbrella term for early childhood development applied to children from birth to nine years as they grow and thrive, physically, mentally, emotionally, spiritually, morally and socially (RSA, 2001:15).

This phase extends from Grade 1 ( $\pm$  7 years) to grade 3 ( $\pm$  9 years). Learners in the foundation phase have all kinds of potential abilities and possibilities to progress on their journey to childhood with the aid of education. They move progressively out of the protective, safe haven of the family and venture into the larger, unfamiliar world of the school and community. In addition, they have already acquired a great deal of independence and shows signs of a quest for knowledge an urge to complete tasks. Their yearning to mix with friends increasingly impels them to form constant relationships. Their language competence and general knowledge enable them to communicate meaningfully with teachers, friends, family and other people (du Toit & Kruger, 1991:103).

The early care that foundation phase learners receive from parents and teachers determines how these learners will learn and relate with others at school and in life. Through such care a child develops the key elements of emotional intelligence, confidence, curiosity, purposefulness, self-control, connectedness, capacity to communicate and co-operativeness (RSA, 2001:11).

### **1.8.2 Child development**

The Interim Policy for Early Childhood Development (RSA, 1996:2) states that child development is "an umbrella term which applies to the process by which children from birth to at least nine years develop and thrive, physically, mentally, emotionally, spiritually, morally and socially" (RSA, 1996:2). This term conveys the importance of a holistic approach to child development and the significance of considering a child's health, nutrition, education and social factors within the context of the family and the community (RSA, 1996:18).

According to du Toit and Kruger (1991:7) development means a “gradual growth, taking shape, unfolding”. Development refers to the gradual perceptibly unfolding change which manifests in the mastery of development tasks as the child reaches the objectives of becoming an adult during his/her progress to adulthood.

The way children develop is determined by the way they think, reflect and learn. Their development determines the way they think about themselves and about their relationships and interactions with friends, family, school and the community.

### **1.8.3 Learning**

Cole and Cole (2001:34) add: “Learning as the process by which an organism’s behaviour is modified as a result of experience.”

Cole and Cole (2001:155) add: “Learning is a relatively permanent change in behaviour brought about by experience of events in the environment.”

The experiences and circumstances a learner with diabetes undergoes throughout childhood may change his/her behaviour permanently. The extent of such change can be controlled by the physical, social and cultural context of the environment in which a child lives. Friends, family, school, teachers and the community have a huge impact on the learning of the child.

### **1.8.4 Learners with special educational needs**

According to Donald, *et al.* (1999:15) “special educational needs are where learners require special help and support if they are to overcome the particular contextual, social, and individual disadvantages and difficulties they face”.

The Interim Policy for Early Childhood Development (RSA, 1996:2) defines learners with special educational needs as “learners with special academic and learning problems, physical health problems concerns and particular social needs” (RSA, 1996:2).

These learners require a strong support network within a community and environment to help and support them with overcoming and managing their disadvantages in coincidence with their development and learning.

### **1.8.5 Developmental assets**

Ebersöhn and Eloff (2003:14) define assets as the “skills, talents, gifts, resources, capacities and strengths that are shared with individuals, institutions, associations, the community and organizations”.

Developmental assets are critical factors for young people’s growth and development. These assets are some of the essential tools and materials children need to grow up healthily. The 40 developmental assets identified by the Search Institute offer a set of benchmarks for positive child and adolescent development. The assets clearly show the important role that family, friends, schools, churches and the community can play in children’s lives. The Search Institute divides these 40 assets into external and internal assets, which are described in Chapter 2 of this study (Search Institute, 2003).

## 1.8.6 Diabetes mellitus

Insulin-dependant diabetes mellitus, also referred to as type I diabetes, is the focus of the study. However, to place diabetes mellitus into a full context, type II and type III diabetes mellitus are also included in the definition of key concepts.

Petray, Freeseemann and Lavay (1997:57) point out that diabetes is a chronic metabolic disease that interferes with the body's ability to produce or use insulin or both. The body fails to burn carbohydrate intake properly, so glucose accumulates in the blood stream. This condition is known as hyperglycaemia, an overabundance of blood sugar. The name diabetes mellitus literally means sweet urine and refers to excessive blood sugar in the urine of the uncontrolled diabetic.

The cycle of normal glucose metabolism is shown in Figure 1.2 below (Petray, *et al.* 1997:57).

[Figure not available]

Figure 1.2 Normal glucose metabolism cycle  
(Petray, *et al.* 1997:57).

As the cycle begins, food is consumed and digested (**Phase 1**). Most of the food is converted to glucose and the blood sugar level in the bloodstream rises (**Phase 2**). The increased blood sugar stimulates the secretion of insulin by the pancreas (**Phase 3**). The insulin enables the glucose to enter the body's cells, providing energy for the body to perform normal functions (**Phase 4**). As the insulin acts on the raised blood sugar, the food intake is metabolised and broken down into a form which can be used by the cells of the body, thus decreasing the blood sugar level to a normal range (**Phase 5**).

Diabetes is the result of the body's inability to produce or use insulin. Because little or no insulin is secreted from the pancreas, glucose cannot penetrate the body's cells and the body cannot perform normal functions. As the glucose remains unused in the bloodstream, continuing to increase the blood sugar level, the body's cells begin to rely on converting stored fat cells into energy. As this continues, ketone bodies – waste products resulting from fat metabolism – accumulate in the bloodstream and are eliminated from the body through the kidneys, spilling over into the urine. In uncontrolled diabetes, the concentration of ketones becomes very high and leads to a strong acid effect known as ketoacidosis. If left untreated, ketoacidosis can be life-threatening (Petray, *et al.* 1997:58).

The American Diabetic Association (2001:1) provides the following classification of diabetes mellitus.

➤ **INSULIN-DEPENDENT DIABETES MELLITUS (IDDM)**

Insulin-dependent diabetes mellitus is defined as diabetes that requires insulin treatment from within 3 months of diagnosis and/or with episodes of ketoacidosis. It is sometimes referred to as Type I diabetes, and in the past has been known as juvenile diabetes, juvenile-onset diabetes mellitus (JODM), brittle diabetes, and childhood diabetes. IDDM is a lifelong, incurable illness, affecting individuals at a younger age than non-insulin-dependent diabetes mellitus. It is regarded as the major form of the disease and is the primary focus of this study.

➤ **NON-INSULIN DEPENDENT DIABETES MELLITUS (NIDDM)**

- i) Non-obese
- ii) Obese

NIDDM is sometimes referred to as Type II diabetes. This includes terms such as adult-onset diabetes mellitus (AODM), stable diabetes mellitus and maturity-onset diabetes mellitus. NIDDM patients are usually over 40 years old, are not necessarily dependent on injection insulin, and are not prone to ketosis.

➤ **OTHER TYPE OF DIABETES RELATED TO:**

- A. Pancreatic disease / surgery
- B. Other endocrine syndromes, e.g. Cushing syndrome
- C. Iatrogenic disease (drugs and chemically induced)
- D. Certain genetic syndromes
- E. Miscellaneous causes

This category of diabetes is sometimes referred to as Type III diabetes, and in the past has been referred to as secondary diabetes (American Diabetic Association, 2001:1).

## **1.9 CONTENTS OF RESEARCH REPORT**

This chapter contains an introduction to the present study. The chapter is an orientation to the contextual and theoretical framework guiding the study, and contains the purpose of the study, the statement of the problem, the research methodology employed and definitions of key concepts. The remainder of this dissertation of limited scope is divided into the following three chapters: **Chapter 2** consists of a literature survey of diabetes mellitus in the development and learning of the learner in the foundation phase. **Chapter 3** focuses on the research design, methodology and findings. **Chapter 4** contains a detailed account of the major conclusions, recommendations, limitations of the study and future research.

