

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The purpose of the study was to explore the psychosocial factors involved in the susceptibility, experience and rehabilitation of injuries sustained in long-distance running and subsequently, to propose a biopsychosocial theoretical model that will attempt to explain the experience of injury and the successful rehabilitation thereof in long-distance running. The study was approached from a biopsychosocial theoretical perspective. A mixed methods research design with the purpose of expansion and using 15 case studies was employed. Two research instruments were utilized; namely, semi-structured interviews and the Myers-Briggs Type Indicator (MBTI).

This chapter is arranged into seven main sections. Firstly, the biopsychosocial theoretical perspective is outlined. Furthermore, the reasons for approaching the study from this theoretical perspective are discussed. Secondly, the research design that was employed and the reasons for doing so are examined. Thirdly, the sampling method, purposive sampling, and the resulting research participants are considered. Fourthly, the ethical considerations of the study are briefly summarized. In the fifth section, there is an elucidation of the research instruments, namely semi-structured interviews and the MBTI. The sixth section deals with the analysis of data; more specifically, the procedure followed in this study is explained. In the final section, the quality of the study is considered.

3.2 The biopsychosocial theoretical perspective

The biopsychosocial theoretical model is a multi-model, multidisciplinary, integrated and comprehensive approach to understanding people (Craigie, 1999; Eck, 1999). First developed by George Engel, the model stems from general systems theory (Pereira & Smith; 2006; Pilgrim, 2002; Schaffner, 2001; Smith, 2002). It proposes that a person can only be understood fully if all the levels of his/her functioning, namely biological or physical, psychological and social are considered (Gove, 1994).

Engel offered an alternative to the biomedical model when he developed the biopsychosocial model. He defined the model at a time when science was progressing from being an exclusively reductionistic and analytic effort to becoming a more contextual and cross-disciplinary endeavour. He criticized three main views in medical thinking. Firstly, he denounced the biomedical model for its dualistic nature in which body and mind are separated. Secondly, Engel was critical of the overly materialistic and reductionistic views of medical thought. More specifically, he disagreed with the notion that anything that cannot be objectively accounted for and verified at the level

of cellular and molecular processes is disregarded. Thirdly, he believed that in order to understand humans, one cannot be totally objective. He was of the opinion that in the study of humans, both the subjects and researchers influence one another. Engel expressed the view that in order to comprehend and respond to patients' suffering, and provide them with a sense of being understood, it is necessary for medical practitioners to attend to the biological, psychological and social dimensions of illness (Borrell-Carrió et al., 2004). He understood the world to be a continuum of systems that interact at different levels (Pereira & Smith, 2006).

The biopsychosocial theoretical perspective embraces the viewpoint that biological or physical, psychological and social processes are integrally and interactively engaged in both physical health and illness (Suls & Rothman, 2004). According to Sperry (1999), physical functioning includes all peripheral organ system functions as well as to all central nervous, autonomic and neuroendocrine system functions that are subcortical. Psychological factors include personal qualities and characteristics such as temperament, self-esteem and self-efficacy as well as cognitions and strategies that influence behaviour. People's social functioning involves their behaviour in relation to family, friends, authorities, cultural expectations and community institutions that affect and are affected by others. Pilgrim (2002) referred to the psychosocial context of an individual as one of increasing complexity. Sperry further expressed the opinion that the holistic approach of the biopsychosocial model may also be understood to include spiritual and religious beliefs.

Medical thinking has evolved and broadened by including, incorporating and integrating psychological and social factors (Smith, 2002). Multiple systems as well as the complexity of these systems are contributory factors in the causes, prevention and treatment of illness (Suls & Rothman, 2004). Even though the relative weight of various psychosocial factors may vary from one illness to another, amongst individuals and between different occurrences of the same illness in the same individual, these factors may contribute, sustain and modify illness (Fava & Sonino, 2008). According to Suls and Rothman, it is important for those involved in the medical profession to comprehend the linkages in the systems. Furthermore, there is not a linear relationship between the components of the systems, but rather a circular one (Borrell-Carrió et al., 2004).

Sperry (1999) stated that biopsychosocial thinking is fast replacing other more parochial perspectives. The biopsychosocial model views a person holistically and comprehensively. It thus differs from reductionistic views such as the psychodynamic model, the behavioural model and the biomedical model. Rather, the biopsychosocial model integrates a number of ideas from many of these models. Furthermore, the model engenders inter-disciplinary co-operation (Pilgrim, 2002).

The present study was approached from the biopsychosocial theoretical perspective for a number of reasons. Long-distance running is primarily a physical activity. A person, however, lives in a psychosocial context of increasing complexity. The World Health Organization defines health as a “complete state of physical, mental and social well-being” (cited in Schaffner, 2001, p. 26). Long-distance runners not only experience physical health benefits, but also perceive psychological and social benefits because of their involvement in the sport.

Sport injury is physical, but may have psychological and social roots. These factors, discussed extensively in Chapter Two, may make one susceptible to injury. The studies examined in the chapter focused on sports in which acute injuries are suffered. Generally, long-distance runners suffer chronic injuries because of overuse (Noakes, 2001). The factors involved in sustaining an acute injury may be different to those involved in a chronic injury. However, physical, psychological and social factors are inter-related and as stated previously, a circular and not a linear relationship exists between them (Borrell-Carrió et al., 2004).

Long-distance runners also experience negative consequences when they are unable to run. These consequences which were also considered in Chapter Two are of a physical, psychological and social nature. There is a need to not only treat the physical causes and symptoms of injury, but also to address the psychological and social needs of injured runners.

The researcher is of the opinion that a more holistic view and thus, a better understanding of the causes, experiences and rehabilitation of injuries sustained in long-distance running was gained by approaching the study from a biopsychosocial theoretical perspective. However, it is also acknowledged that it was not possible to explore all the components of long-distance running injuries in depth.

3.3 Research design

A mixed methods research design with the purpose of expansion and using case studies was employed in the study. Johnson and Onwuegbuzie (2004, p.17) defined mixed methods research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study.” The focus of mixed methods research includes induction, namely, the discovery of patterns; deduction which involves the testing of patterns; and abduction which may be explained as the process of uncovering and relying on the most suitable of a group of explanations which will allow researchers to understand their

results. Both quantitative and qualitative research are important; mixed methods research does not aim at replacing either of these two approaches, but uses the strengths and lessens the weaknesses of both approaches in single studies as well as across studies. Johnson and Onwuegbuzie further stated that philosophically mixed methods research is referred to as the 'third wave' or third research movement. It offers a practical and logical alternative to quantitative and qualitative research designs, and thus, moves beyond the disputes between the other two approaches.

Johnson and Onweugbuzie (2004) stated that researchers need to take cognizance of the characteristics of both quantitative and qualitative research before they employ a mixed methods research design. Quantitative research is chiefly characterized by deduction, confirmation, hypothesis and theory testing, prediction, standardized collection of data, statistical analysis and explanation. The principal characteristics of qualitative research, on the other hand, are induction, exploration, discovery, hypothesis and theory generation, and qualitative analysis. The researcher may also be viewed as the primary instrument of collecting data. According to Johnson and Onwuegbuzie, it is necessary to understand the strengths and weaknesses of both approaches in order to combine strategies in an effective manner and thereby, employ the fundamental principle of mixed research. This principle involves the collection of multiple data by means of the use of different methods and strategies in a manner that the emerging combination is likely to result in the complementary strengths and nonoverlapping weaknesses of both qualitative and quantitative approaches. They expressed the view that an understanding and productive use of the fundamental principle of mixed research justifies mixed methods research designs as the resulting outcome will be superior to monomethod research. Furthermore, it is important that mixed methods research employs a philosophy and method that will combine the insights provided by qualitative and quantitative research in order to achieve a solution that is workable. Johnson and Onweugbuzie further noted that regardless of the approach that researchers adopt, all research in the social sciences is an endeavour to produce forthright assertions about human beings and the contexts in which they live.

The value of mixed methods research in comparison to using quantitative or qualitative datasets alone was outlined by Cresswell and Plano Clark (2007) as follows:

- Mixed methods research has advantages that counterbalance the disadvantages of both quantitative and qualitative research. Qualitative research has been criticized because of researchers' personal interpretations and thus, the resulting bias created by this subjectivity. Furthermore, because there are only a limited number of participants in qualitative research, it is difficult to generalize findings to a larger group. On the other hand, quantitative research does not allow for an in-depth understanding of the participants' views and feelings as well as their personal

contexts. Researchers' personal interpretations are not often considered and discussed. Thus, according to Johnson and Onwuegbuzie (2004), by employing mixed methods research the weaknesses of the one approach can overcome the weaknesses of the other approach.

- There is more extensive evidence for studying a research problem when using mixed methods research than when using either quantitative or qualitative research alone. Researchers are not limited to data collection linked to qualitative research or quantitative research, but may use all the available types of data collection.
- Mixed methods research is of value when a quantitative or qualitative approach alone would not produce an adequate answer. Johnson and Wuegbuzie added that because researchers are not limited to a single approach, they are able to answer a wider and complete range of questions. They further stated that researchers are thus able to provide stronger evidence for a conclusion by means of the corroboration and convergence of findings.
- When employing a mixed methods research design, qualitative and quantitative researchers are encouraged to work together. This, in turn, strengthens the research.
- Mixed methods research encourages and allows for the use of a number of worldviews and paradigms rather than those associated with either quantitative or qualitative research.
- Mixed methods research has been referred to as being practical because researchers are free to use a number of possible methods to address a research problem. Furthermore, both inductive and deductive thinking can be combined so as to promote a better understanding of the world.

Despite its advantages, mixed methods research is not easy to conduct. Johnson and Onwuegbuzie (2004) summarized the weaknesses of mixed methods research as follows:

- It may be difficult for one researcher to conduct both qualitative research and quantitative research, especially if both approaches are used concurrently. This may complicate the research and thus, may necessitate the use of a research team.
- Researchers may be required to be trained in both approaches and learn to mix them in a suitable way. Cresswell and Plano Clark (2007) also highlighted this disadvantage when they stated that most researchers are often only trained in one approach.
- Mixed methods research is more expensive as well as more time consuming. Cresswell and Plano Clark expanded on this weakness when they stated that mixed methods research may require a number of resources to collect and analyze both quantitative and qualitative types of data.
- Research methodologists still have to work out a number of the details of mixed methods research properly. These include how to qualitatively analyze quantitative data and how to interpret conflicting results. In this regard, methodological purists

advocate that researches should either utilize the quantitative or qualitative approach, and not both.

Greene, Caracelli and Graham (1989) put forward five main purposes or justifications for conducting mixed methods research. These are as follows:

- **Triangulation:** This may be defined as searching for the convergence, corroboration and correspondence of results from different methods and designs that are studying the same phenomenon.
- **Complementarity:** This involves looking for clarification, illustration, elaboration and enhancement of the results of one method with those of the other method.
- **Initiation:** This entails discovering paradoxes and contradictions and new perspectives of frameworks. These findings will lead to a re-framing of the research question(s) or results with the research question(s) or results from the other method.
- **Development:** This requires using the findings from one method to inform or advise the other method. Development is generally interpreted to include sampling, implementation and the measurement of decisions.
- **Expansion:** This occurs when the researcher wishes to expand the breadth and range of research by employing different methods for different components in the inquiry. The reason for expansion is to increase the scope of research by selecting the methods that are the most suitable for multiple inquiry components.

Johnson and Onwuegbuzie (2004) stated that researchers must make two important decisions when constructing a mixed methods research design. Firstly, researchers must decide whether they wish to operate mainly within one dominant approach and secondly, whether they want to conduct the phases concurrently or sequentially. Johnson and Onwuegbuzie explained that the findings from the qualitative phase as well as from the quantitative phase must be integrated at some stage. They clarified this statement with an example: A qualitative phase might be carried out sequentially in order to advise or inform the quantitative phase, or if the quantitative and qualitative phases are undertaken concurrently, the findings of both phases must at least be integrated when the findings are interpreted. They further stated that a principle of mixed methods research is that researchers may create designs that will answer their research questions effectively; this contrasts with the common approach in traditional quantitative research in which researchers choose a specific design from a group of designs. Nine mixed methods research designs as postulated by Johnson and Onwuegbuzie are depicted in Figure 3.1. It should be noted, however, that the authors stated that one should not be limited by these designs and they further emphasized the need to be creative when deciding upon a particular design. They expressed the opinion that on occasions a design could emerge during a study in new ways; this would be dependent on both the conditions and the obtained information.

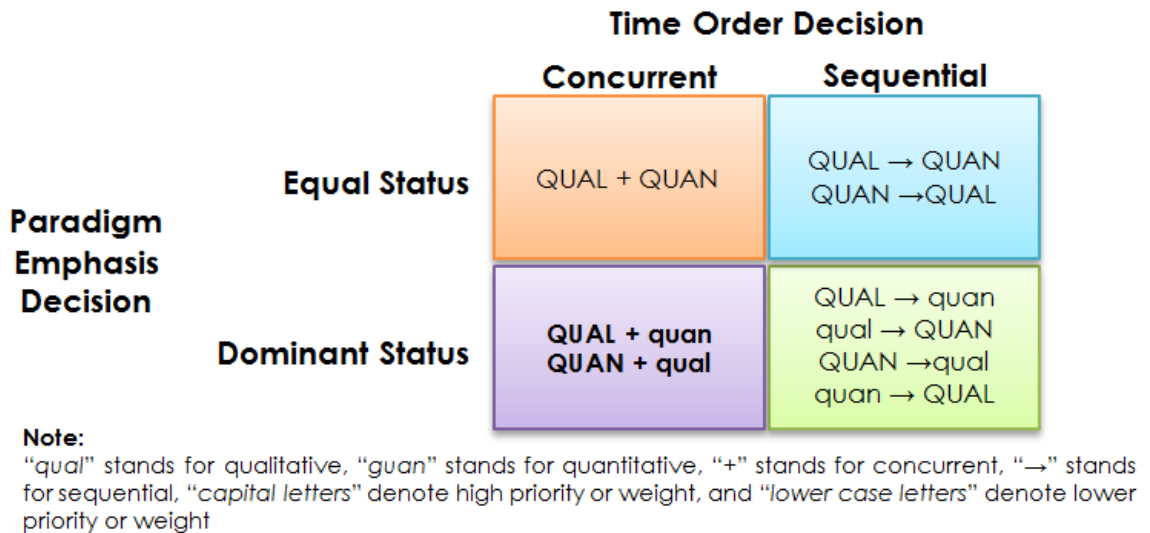


Figure 3.1a: Mixed-method Design Matrix with Mixed-method Research Designs Shown in the Four Cells

In order to enhance the quality of the study, a mixed methods research design as depicted by Johnson and Omwuegbuzie (2004) was employed in the present study. The rationale for conducting mixed methods research was expansion. As previously stated, the purpose of expansion is to expand the range and breadth of research by employing different methods for the various components of the study. Most of the study was conducted within the qualitative paradigm, but both qualitative and quantitative techniques were used concurrently to collect the data. Johnson and Omweugbuzie's mixed methods design matrix which was portrayed in Figure 3.1a is reproduced again in Figure 3.1b; in the latter figure, the mixed methods research design which was employed in the present study is highlighted.

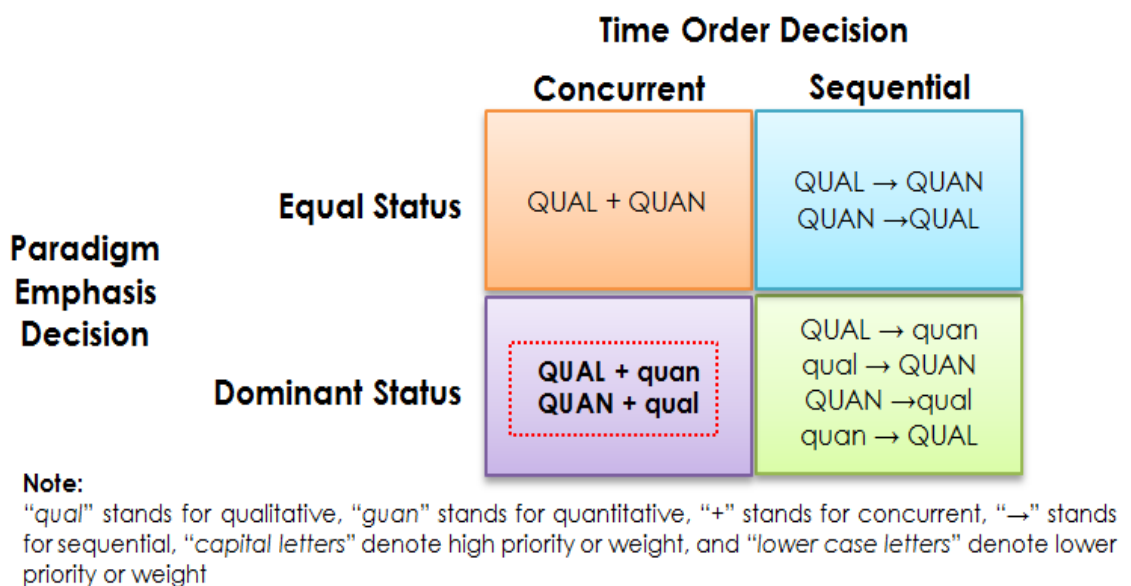


Figure 3.1b: Mixed-method Design Matrix with Mixed-method Research Designs Shown in the Four Cells

In the present study, semi-structured interviews were conducted in order to explore long-distance runners' experiences of injury sustained in the sport. The aspects that were explored during the interviews included the runners' training programs, the benefits they perceived as a result of their involvement in the sport, their personal understanding of injury, their psychological responses to injury, the causes to which they attributed their injuries, the coping mechanisms they employed, and their approach to rehabilitation. These aspects are highlighted in a subsequent section when the semi-structured interviews that took place are discussed more fully. Each participant also completed the MBTI; this quantitative form of data collection was used to examine what preferences long-distance runners exercise. Both qualitative and quantitative forms of data collection were employed in order to expand the breadth and range of the study. In other words, the themes that emerged during the interviews as well as the results of the MBTI afforded the researcher the opportunity to have a fuller and more complete picture of what biopsychosocial factors are involved in injuries sustained in long-distance running injuries.

In the present study, dominant status was given to the qualitative component of the study. Hence, it is necessary to describe the essence of qualitative methodology and further highlight the characteristics of this type of research.

Qualitative research yields descriptive data in the form of people's own spoken or written words as well as from their observable behaviour (Taylor & Bogdan, 1984). Researchers who utilize qualitative methodology study individuals in their social environments; furthermore, they examine how individuals make sense of their surroundings. The qualitative approach affords researchers opportunities to access unquantifiable information about people. Consequently, qualitative techniques allow researchers the opportunity to become involved in the perceptions of people and to explore how they find and give meaning to their lives (Berg, 1998). Willig (2001) stated that qualitative researchers are concerned with the quality and texture of people's experience.

Qualitative research is inductive. Researchers do not collect data to verify hypotheses and theories, but rather study patterns in the data so as to develop concepts and insights. Consequently, the qualitative approach affords researchers the opportunity to follow a flexible research design (Taylor & Bogdan, 1984).

Qualitative researchers examine people holistically in their situations. They are not reduced to variables and statistics, but rather the researchers endeavour to know them personally and share their experiences. They are interested in the meaning that people

themselves attach to how they experience events (Willig, 2001). Thus, this type of research is humanistic. Furthermore, qualitative researchers are sensitive to how they may affect the people they study. This type of research has been described as naturalistic because the researchers study and interact with people in a natural and unobtrusive manner. Qualitative researchers also try to empathize and identify with the people they study in order to understand how they perceive things and moreover, they value all the views of people as they strive for an understanding of others' viewpoints. Moreover, they believe that it is worthwhile to study all people and the situations in which they live (Taylor & Bogdan, 1984).

Qualitative researchers do not allow their beliefs, predispositions and views to influence their research. Furthermore, validity is of utmost importance to them as they make certain that there is a close link between the data and what people say and do. However, qualitative researchers are invited to be flexible, not follow procedures rigidly and be their own methodologists. In this way, qualitative research is not as standardized as other research approaches, but is often referred to as a craft (Taylor & Bogdan, 1984).

The present study, as stated previously, employed a mixed methods research design using case studies. Thus, a brief description of case studies follows. According to Berg (1998), in case studies information about an individual, group, social setting and/or event is collected systematically so that researchers can effectively understand how it functions. This methodological approach may employ a number of data gathering techniques such as documents, life histories, participant observation, oral histories and in-depth interviews. The case study method is versatile and thus, its focus may be extensive or selective. This type of method is known to yield an in-depth description of a small number of cases (Mouton, 2001).

According to Berg (1998), case studies can give rise to insights and hypotheses that may form the bases of subsequent studies. Mouton (2001) observed that the strengths of case studies include high construct validity and in-depth insights. Stake (2000), however, stated that not everything that emerges from case studies can be understood. Berg stated that when deliberating on the scientific value of the method, two concerns should be addressed. Firstly, one may question the objectivity of the results of case studies if researchers make subjective decisions. Berg declared that case studies are as objective as any other methods of data collection and analysis. He added that regardless of whether a study employs a qualitative or quantitative research design, researchers are required to explain what they investigated and by what means. Furthermore, subsequent research will confirm whether the findings and analysis of the research were correct. Secondly, some question the generalizability of the results obtained from case

studies. Berg refuted this concern; he stated that human behaviour is seldom unique, idiosyncratic and spontaneous, but predictable and thus, case studies have scientific value. In the present study, semi-structured interviews were conducted with 15 participants; this is discussed in a subsequent section.

3.4 Sampling and research participants

Purposive sampling with a snowballing effect was used in the present study to select the sample of 15 long-distance runners who were injured or had recently recovered from injury. The sample was considered to be large enough to secure an extensive range of responses as well as provide an in-depth exploration of each case (Willig, 2008). The decision to have a sample of 15 participants was confirmed during the analysis of the data when, based on the responses from the sample, saturation was reached. Thus, it was not deemed necessary to extend and enrich the analysis.

In purposive sampling, researchers use their knowledge and understanding about a group in order to select participants who represent this population. In order to make certain that specific types of individuals who have particular attributes are included in the study, purposive sampling may occur after field investigations (Berg, 1998).

In the present study, runners who were injured were invited to participate in the study. This was done by means of contacting the secretaries of running clubs and asking them to inform their members of the study in their weekly or monthly newsletters. Information leaflets were also left in shops that specialize in selling running shoes and running gear.

The researcher found it difficult to find injured runners who wished to participate in the study. The reasons for this appear to be two-fold. Firstly, not all runners sustain injuries at the same time. Secondly, during the interviews it became evident that long-distance runners tend to be reluctant to speak about their injuries.

The method of sampling had a snowballing effect when runners who participated in the study referred other injured runners to the researcher. In some instances, the participants gave the contact details of their friends who were injured to the researcher. These runners were then contacted; the purpose of the research and other relevant information pertaining to the study was explained to them.

The study was strengthened as well as disadvantaged because of the selected sampling method. Purposive sampling with a snowballing effect ensured that the majority of the participants were committed runners. However, at the time of their interviews, not all the participants were at the same stage of injury as some had recently sustained an injury, some had almost recovered from their injuries and finally, some had recovered from their

injuries. Therefore, their experiences of injury and attitudes towards rehabilitation may have differed.

3.5 Ethical considerations

The study was approved by the Ethics Committee of the University of Pretoria. Furthermore, full disclosure of the research was explained verbally and given in writing to each of the participants. Their rights were explained to them verbally as well as in writing. These included the right to privacy, the right to anonymity and confidentiality, and the right not to be harmed in any manner (Mouton, 2001). A copy of the letter given to the participants can be found in Appendix A.

3.6 Research instruments

The present study, employing a mixed methods research design, made use of both qualitative and quantitative data collection techniques; namely, semi-structured interviews and the MBTI respectively.

3.6.1 Semi-structured interviews

Most of the present study was conducted within the qualitative paradigm. The researcher conducted a semi-structured interview with each participant in order to explore what psychosocial factors are involved in the susceptibility, experience and rehabilitation of injuries sustained in long-distance running.

The interview is a fruitful method of collecting information and approaching various types of assumptions. It is particularly useful in understanding participants' perceptions as well as exploring how they make sense of phenomena or events (Berg, 1998). Furthermore, the interview may be utilized as an instrument to capture the salient incidents and experiences of an individual's life. It captures an individual's subjective experiences and further affords researchers the opportunity to know people thoroughly (Taylor & Bogdan, 1984). According to Kerlinger (1986, p.487), the interview is "a potent and indispensable research tool, yielding data that no other research data can yield."

Semi-structured interviews, also referred to as semi-standardized interviews, lie somewhere between the extremes of completely structured and unstructured interviews. Researchers make use of a number of predetermined questions that they usually ask in a systematic and consistent order. However, they are given the freedom and permitted to probe beyond their prepared and standardized questions as well as the interviewees' answers (Berg, 1998).

The questions asked in a semi-structured interview aim to shed light on how individuals understand and make sense of their world. Thus, it is necessary for researchers to approach the world from the interviewees' perspectives. Consequently, researchers should use the level of language and vocabulary with which the interviewees

communicate. Unscheduled probes also help ensure accurate and complete communication between the researchers and the interviewees. Subsequently, this will afford the researchers the opportunity to understand the participants' perceptions and how they attach meaning to their experiences and contexts (Berg, 1998).

In the present study, each participant was interviewed for approximately one hour; the interviews lasted between 45 minutes and 80 minutes.

During each participant's interview the following aspects were explored:

- running experience
- training program
- perceived benefits and disadvantages of long-distance running
- personal understanding of injury
- experience of injuries
- perceived causes of injury
- psychological responses to injury
- approach to rehabilitation
- coping mechanisms

At the outset of the interviews, the researcher asked the participants to elucidate on their experiences of running. This encompassed for how long they had been involved in the sport and what races they had run. They were also encouraged to share the details of their training programs. These initial questions helped the researcher to establish a rapport with each of the participants. The participants were then invited to speak about the benefits and disadvantages they associated with the sport. Once the researcher felt that the participants were at ease and able to communicate freely, they were asked what their personal understanding of injury was. They were then encouraged to speak about their own injuries, why they believed they had got injured and the rehabilitation they were receiving. Finally, they were asked about their support systems and coping mechanisms. A list of the questions that were asked during the participants' interviews can be found in Appendix B. Furthermore, a table which depicts how the questions are related to the factors explored during the interviews can be found in Appendix C. However, it must be noted that because of the nature of semi-structured interviews, all the questions may have yielded responses that did not necessarily relate to the factor for which the question was meant.

Each participant completed the MBTI after his/her interview. This research instrument is described in the next section.

3.6.2 The Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) is a psychometric questionnaire that was designed in order to provide information on the theory of psychological types as postulated by C.J.

Jung (Maddi, 1980). After studying Jung's theories for a period of 20 years, Katherine Briggs became confident that Jung's Psychological Types was of immense value in helping people to understand themselves as well as others. Consequently, Katherine Briggs and her daughter, Isabel Myers started designing an inventory to assist people to determine their Jungian preference type. Myers spent more than 35 years working on the instrument; she worked with large samples of, for example, 15 000 in order to validate the inventory. Although neither Briggs nor Myers studied psychology formally, the MBTI has been acclaimed by many (van Rooyen & de Beer, 1995).

The theory underlying the MBTI is that variation in behaviour is not the result of chance, but rather due to observable differences in mental functioning, specifically in the preferences people exercise in the way they perceive and the manner in which they make judgements (Briggs Myers & Myers, 1980; Quenk, 1996; Quenk, 2000). At the core of the MBTI is the concept of preferences; what is most natural to a person and what makes him/her feel most comfortable (Bayne, 1995).

Preferred behaviour involves two sets of attitudes or orientations, namely perceiving (P) and judging (J), and extraversion (E) and introversion (I). Perceiving and judging, in turn, involve four basic functions or processes, namely sensing (S) and intuition (N), and thinking (T) and feeling (F) respectively (van Rooyen & de Beer, 1995).

Perceiving involves the processes people employ to become aware of incoming information such as people, events and ideas. Judging, on the other hand, includes the processes of drawing conclusions and making decisions about what has been perceived (Killen & Murphy, 2003). According to Briggs Myers and Myers (1980), to a large extent perception and judgement determine how people behave because perception governs how they view a situation and their subsequent behaviour is influenced by their judgement.

According to Jung, there are two different, contrasting ways of perceiving, namely sensing and intuition. Sensing refers to perceiving by means of the five senses. When people employ this mode of perception, they pay direct attention to immediate experiences, facts and details. Intuition has been referred to as indirect perception as it allows people to perceive beyond the five senses, and become aware of possibilities and relationships by means of insight. Although people are able to use both kinds of perception, most prefer to use one of the processes (Briggs Myers & Myers, 1980; Dunning, 2003; van Rooyen & de Beer, 1995). Sensing types exhibit the following behaviours and attitudes: they like facts; they are realistic, practical and observant; they work steadily and are good with detail; and they are patient and follow a procedure when working (Bayne, 1995). Furthermore, they are present-orientated and trust experience (Myers, Kirkby & Myers, 1993). Intuitive types see possibilities and patterns, and like to see the complete picture; they are imaginative and speculative; they tend to

work in bursts of energy and seek inspiration in quiet; and they enjoy variety and become impatient with routine (Bayne). They are also future-orientated and trust inspiration. Furthermore, intuitive types are known to be abstract and theoretical (Myers et al.).

There are also two distinct processes people employ to draw conclusions and make judgements about their perceptions: thinking and feeling. According to Briggs Myers and Myers (1980, p.3), thinking is a “logical process, aimed at an impersonal finding”. Furthermore, thinking concerns itself with the principles of cause and effect as well as the principles of fairness and justice. However, when people use the function of feeling to come to conclusions and make decisions, they consider relative values and issues of merit (Dunning, 2003; van Rooyen & de Beer, 1995). Once again, whereas people are able to use both processes of judging, they do give preference to either thinking or feeling. Those who give preference to thinking are guided by clear and consistent principles; they tend to be fair, yet firm; they are also analytical, logical and may appear to be businesslike; and they may be critical and sceptical (Bayne, 1995). Thinking types also use cause-and-effect reasoning and strive for impersonal, objective truth. They are also known to be ‘tough- minded’ (Myers et al., 1993). Sensing types are trusting and enjoy pleasing others in their quest to maintain harmony, and they have clear and consistent values. Furthermore, they tend to be aware of others’ feelings, and are warm and sympathetic towards them (Bayne, 1995). They are often referred to as ‘tender-hearted’ (Myers et al.).

A further difference in people’s use of perception and judgement involves two complementary orientations to life, namely introversion and extraversion (Briggs Myers & Myers, 1980). In contemporary usage, introverts are considered to be shy whereas extraverts are viewed as sociable. However, Jung’s concept of introversion-extraversion and Myers’ description thereof are far more expansive. Introverts focus their energy inward; they are interested in the inner world of ideas and concepts. Introverts exhibit the following attitudes and behaviours: they value time spent alone; although they may enjoy social contact, they need time alone to recover from it; they spend time in reflection before interacting with strangers; they learn best by reflection and rely on their own insights; and they prefer to communicate in writing and often do not know what to say on the spur of the moment. Introverts also have a need to understand a situation before experiencing it, but then are able to master and manage a situation because of their knowledge and understanding thereof (Bayne, 1995). According to Myers et al. (1993), they are private and contained, focus easily and have a depth of interest. Extraverts, on the other hand, direct their attention to people and objects of the outer environment; they derive their energy from others. The following attitudes and behaviours are associated with extraversion: as they prefer the external world of people and things, extraverts enjoy being with people; they take initiative in forming relationships, are competent communicators, and enjoy sharing their views and

observations with others; they tend to engage in discussions before reflecting; and they prefer to communicate verbally than in writing. Furthermore, in order to understand situations, extraverts have a need to experience them; they learn best by doing and work by means of trial and error; and they often come to knowledge by being with others, and sharing and discussing ideas and opinions with them (Bayne; van Rooyen & de Beer, 1995). They are known to have a breadth of interests (Myers et al.)

The final preference people exercise concerns the lifestyle they adopt. People can either adopt a perceptive attitude or a judging attitude as a method of dealing with the world. It is imperative that people use both perception and judgement; however, both cannot be used simultaneously and thus, people tend to move to and fro between these two attitudes. Conversely, people tend to be more comfortable with one of these attitudes and hence, the judging-perceptive preference (Briggs Myers & Myers, 1980). Judging types tend to be decisive, organized, systematic and industrious. They are also known to be determined. They also display a need to meet deadlines and are happy when matters have been settled (Bayne, 1995). Consequently, they prefer to plan ahead so as to avoid stress at the last minute (Myers et al., 1993) Some of the behaviours and attitudes perceptive types are known to display are as follows: they are curious, flexible and spontaneous; completing tasks at the last minute energizes them; they are good at adapting to situations and do not mind making changes to plans and decisions; they trust their capabilities; and they enjoy searching and finding more than making decisions (van Rooyen & de Beer, 1995). According to Myers et al., they are open-ended and casual.

The theory underlying the MBTI holds that people create their type when they exercise their individual preferences. Each of the four sets of preferences is independent of the other preferences and consequently, there are 16 types (Briggs Myers & Myers, 1980). They are depicted in Table 3.1. An understanding of preferences is imperative to understanding the MBTI. Preferences are not personality traits, but rather what people find most agreeable and easy when making choices. The notion of type does not attempt to explain individuality. Rather, type gives people the opportunity to understand self, self-development and others. Furthermore, preferences and type should be viewed as reference points and do not place people in pigeon holes (Bayne, 1995).

ISTJ	ISFJ	INFJ	INTJ
ISTP	ISFP	INFP	INTP
ESTP	ESFP	ENFP	ENTP
ESTJ	ESFJ	ENFJ	ENTJ

Table 3.1: The Type Table of the MBTI

The concept of type goes beyond the four preferences. In each type there is one function that dominates the other functions. This is referred to as the first function. Extraverts use their first function in the outer world whereas introverts use their first function

in the inner world and their second or auxiliary function in the outer world. The dominant function of extraverts is determined by the preferred perceptive function, namely sensing (S) or intuition (N) or the preferred judging function, namely feeling (F) or thinking (T). According to Killen and Murphy (2003), the dominant function is the core of a person's personality. Determining what the dominant function is best illustrated by an example: the dominant function for an ESTP is S whereas the dominant function for an ESTJ is T. On the contrary, for introverts the auxiliary function and not the dominant function is reflected by the J or P in their type. Thus, if an introvert's type ends in J, the dominant function is a perceptive function; for example, the dominant function for an INFJ is N and the auxiliary function is F. The second or auxiliary function is the preference from S, N, T or F in the four-letter type that is not dominant. Thus, if a person's dominant function is a perceiving function (S or N) then his auxiliary function will be a judging function (T or F). The auxiliary function is viewed as providing the balance for one's personality (Killen & Murphy). The third or tertiary function is the opposite of the auxiliary function, and the fourth or inferior function is the opposite of the dominant function (Bayne, 1995; Briggs Myers & Myers, 1980; van Rooyen & de Beer, 1995).

In the interest of brevity, a description of each of the sixteen types of the MBTI can be found in Appendix D.

Van Rooyen and de Beer (1995) noted the importance of psychometric instruments being both reliable and valid; thus, the reliability and validity of the MBTI is briefly reviewed. Reliability is a measure of the consistency of an instrument; in other words, how consistently does it measure what it is supposed to do. According to van Rooyen, de Beer and Proctor (1999), the reliability of the MBTI was assessed by means of three methods. Firstly, the reliability of the MBTI was evaluated by means of split-half reliability; results indicate values of 0.84 and 0.86 for the internal consistency of the instrument. Secondly, the stability of the Indicator was determined by test-retest assessment; 0.76 was recorded for temporal stability. Thirdly, alternate or equivalent forms were also employed to assess reliability. Van Rooyen et al. stated that determining the reliability of the MBTI was assisted because various forms of the Indicator all contain 94 basic questions. It was found that the four scales of the MBTI compare positively with respected and well known trait-based instruments. Furthermore, 92% of individuals with clear preferences and 81% of those with medium preferences have stable types over a period of time.

Validity indicates if an instrument measures what it purports to measure. According to Van Rooyen et al. (1999), it indicates the level of confidence that can be put in the results of the instrument. The validity of the MBTI was tested in terms of the following: face validity, content validity, criterion-related validity and construct validity (van Rooyen & de Beer, 1995). Results demonstrate that the MBTI has good discriminant, predictive and

convergent validity in respect of scores on other personality inventories, occupational preferences, best-fit type assessments and independent observation of behaviour. Furthermore, results indicate strong support for the validity of the structure of the four factors of the Indicator, construct validity which is supported by factor analysis as well as convergent validity between the instrument and the Five-Factor model (van Rooyen et al.).

The MBTI has been completed by many athletes, coaches and those involved in sports administration. It has been acknowledged to be one of the most widely used personality tests in the world. It has also been asserted that more research on the MBTI has been conducted than on any other personality inventory (The Move Mountains Group, n.d.). Despite this the researcher failed to find any academic research that has been conducted on psychosocial factors involved in sport injury that has used the MBTI. According to Gee, Marshall and King (2010), personality inventories such as the MBTI have chiefly been employed in the process of identifying talent for sports teams. They further asserted that most studies that have used ipsative tools such as the MBTI have not been successful in predicting athletic performance. Meade (1994) stated that personality inventories such as the MBTI can be used for coaching and intra-individual purposes as they provide a descriptive overview of particular individuals, but are unlikely to make reliable and valid interpersonal comparisons because of their design properties. However, there is a proliferation of articles on popular websites that attempt to apply the MBTI to various aspects of sport. These articles tend to focus chiefly on how a comprehensive understanding of an athlete's personality type can help to enhance his/her performance as well as that of the team (Meier, n.d.)

In view of the apparent paucity of research conducted on the MBTI and psychosocial factors involved in sport injury, the present study will be enhanced because of its inclusion. The researcher decided to use the MBTI to explore whether the specific preference type of each participant as well as the subsequent preferences they exercised played a role in their experience of injury. One may question if a long-distance runner's training program, perceived benefits of running, personal understanding of running injury, experience of injuries, perceived causes of injury, psychological responses to injury, approach to rehabilitation and coping mechanisms are related to his/her specific preference type as defined by the MBTI.

3.7 Analysis of data

The researcher relied upon thematic analysis to make sense of and analyze the data obtained during the interviews. Thematic analysis is a widely used qualitative analytic method within psychology. Even though it is not often that is acknowledged, it is best viewed as a foundational method for qualitative analysis. It can be described as a method that is employed to identify, analyze and describe patterns or themes within

data obtained during qualitative research (Braun & Clarke, 2006). In the present study, inductive analysis was used to identify the themes.

Furthermore, thematic analysis can be viewed as a flexible and beneficial research tool which in essence is independent of theory. Thus, it can be used within a variety of theoretical and epistemological frameworks. Furthermore, it has the potential to yield a detailed, abundant and complex description of data (Braun & Clarke, 2006). Taylor and Bogdan (1984) stated that their approach to data analysis is aimed at developing an in-depth understanding of the people and environments under study.

In the present study, the researcher wished to explore and come to a comprehensive understanding of long-distance runners' experiences of injury. The steps outlined by Braun and Clarke (2006) were used as a guideline in the analysis; these steps are described shortly. This method of analysis was also used to link the MBTI results for each participant with the themes that emerged during their interviews. Taylor and Bogdan's (1984) approach to data analysis also guided the researcher in the present study. Throughout the analysis, cognizance was also taken of the view that researchers are inclined to advance their own methods of analyzing qualitative data (Taylor & Bogdan).

The following steps were carried out in the data analysis:

- The interviews were tape-recorded. They were then transcribed by the researcher. This gave the researcher the opportunity to become familiar with the contents of the interviews. It was during this phase that the process of looking for patterns and topics of interest commenced (Braun & Clarke, 2006). Furthermore, the researcher kept a note of these patterns, ideas, hunches and possible themes (Taylor & Bogdan, 1984).
- Once the interviews had been transcribed in writing, the researcher typed the transcriptions. This, once again, afforded the researcher the opportunity to become familiar with the material. According to Braun and Clarke (2006), transcription is not a wasted activity, but rather it advises the initial stages of analysis and enables a thorough understanding of data. The transcribed interviews can be found in Appendix E.
- The researcher then read and reread the data carefully. Taylor and Bogdan (1984) stated that this process makes it possible for the researcher to know the data thoroughly. It was during this phase in the present study that the researcher started to look for and discover emerging themes.
- Once the material had been read carefully, the researcher started to make notes on the transcriptions. Subsequently, these notes were transferred to a notebook. During this stage, extracts of each participant's transcribed interviews were collated. These notes were used to produce a list of ideas and hence, initial codes were generated (Braun & Clarke, 2006). All the data was coded. This was done for each individual participant and later for the group as a whole.

- The codes were then were then classified into themes. The themes were subsequently further classified and placed into categories. In order to avoid any ambiguity, extracts from the interviews were continually linked to the themes that had emerged. The data that did not fit into any particular theme were placed under 'miscellaneous.'
- The themes were then reviewed and refined. During this phase some of the themes were discarded and others were grouped together. At this stage of the thematic analysis it became evident that analysis is not a linear process, but rather a recursive process. In other words, during analysis a researcher does not simply advance from one phase to the next, but rather it may be necessary move backwards and forwards throughout the phases (Braun & Clarke, 2006).
- Finally, the themes were defined. More specifically, the essence of each theme was established. The essence of each theme is captured in the results for each participant as well as in the integrated results of all the participants.

Once the thematic analysis of the data captured during the interviews was complete, each participant's MBTI results were analyzed. This was done as follows:

- The researcher ascertained what each participant's results for the MBTI were.
- The researcher made a detailed study of what behaviours and attitudes are characteristic of each of the sixteen types of the MBTI.
- The researcher then read and reread the data in the interviews, and then linked the behaviours and attitudes displayed in the interviews with those characteristic of the relevant type. It must be noted that when the interviews were conducted as well as transcribed and coded, the participants' non-verbal communication was recorded. This process assisted this phase of the analysis.
- The coding described above was then collated for each participant as well as for all the participants who had a particular preference.
- The themes found in the thematic analysis of the data captured in the interviews were linked with the attitudes and behaviours characteristic of the relevant types as portrayed by the participants.

3.8 Quality of research

A consideration of the quality of the research is of the utmost importance. In this regard, the validity of the research and the insider status of the researcher are examined.

Validity, in qualitative research, is concerned with description and explanation, and whether the explanation is in accordance with the description; the credibility of the explanation is the focal point of validity (Janesick, 2000). As stated previously, Mouton (2001) stated that high construct validity is a strength of case studies. Willig (2001), however, stated that validity can be problematic for qualitative researchers, but can be resolved. Data collection techniques in qualitative methodologies strive to ensure that

the participants feel free to challenge the researchers' premises about the meanings explored in the research. The researcher in the present study believes that the nature of the semi-structured interview afforded the participants the opportunity and liberty to engage in a discussion with the researcher about the sense and significance of factors inherent in injuries sustained in long-distance running. Furthermore, using many verbatim quotes from the participants themselves was a way of supporting the credibility of the analytical claims or as suggested by Morrison and James (2009) achieving 'referential adequacy.'

According to Willig (2001), reflexivity makes certain that the research process is continuously examined throughout and that researchers constantly review their position in the research. Wilkinson (1988) stated that reflexivity may be regarded as disciplined self-reflection. She further stated that the studies researchers choose to conduct are often a reflection of their personal interests and concerns; this may be regarded as a resource which advises their research. Regarding the present study, it should be noted that the researcher has been involved in long-distance running for a number of years. While some may consider that the analysis may have been approached with preconceived ideas and bias, the researcher does not believe this to be the case. Rather, the researcher is of the opinion that her research was strengthened because of her insider status. The advantages of insider research include the following: an in-depth and authentic level of understanding as a result of prior knowledge; an easy formation of rapport and trust between researchers and participants; the capacity to ask meaningful questions and make sense of non-verbal cues; and a sense of oneness which can reinforce trust and openness throughout the study (Merriam et al., 2001; Taylor, 2011). In the present study, the researcher believes that as a runner, she was more sensitive to the experiences and feelings of the participants in the study, and thus, considers the study to be advantaged because of her involvement in the sport. However, cognizance should also be taken of Janesick's (2000) view that qualitative researchers do not contend that an event can only be interpreted in one way. Outsider status affords researchers the opportunity to be more objective and understand things that may not be apparent to insider researcher (Merriam et al.). It should be noted, however, that in the present research other interpretations were attained through discussions with the promoter and other researchers who are not involved in long-distance running. Thus, the researcher was able to draw on interpretations outside those allowed by her own subjective involvement in the study.

3.9 Conclusion

In this chapter, the research methodology of the present study was discussed. Firstly, the reasons for approaching the study from a biopsychosocial theoretical perspective were studied. Secondly, the research design that was employed, namely a mixed methods

design with the purpose of expansion and using case studies was examined. Thirdly, purposive sampling as the sampling method employed and the resulting research participants were considered. In the fourth section, the ethical considerations of the study were briefly outlined. The research instruments, namely semi-structured interviews and the MBTI were examined in the fifth section. The sixth section of the chapter dealt with the analysis of data. The quality of the research was considered in the final section. There is a detailed presentation of the results in the following chapter.