

1

**THE PSYCHOFORTOLOGY OF WOMEN UNDERGOING INFERTILITY  
TREATMENT AT A PRIVATELY MANAGED HEALTH CARE UNIT**

**KERRY MEGAN PHILLIPS**

Submitted in partial fulfilment of the requirements for the degree of

Magister Artium

in

Clinical Psychology

in the

Faculty of Health Sciences

at the

Nelson Mandela Metropolitan University

**Supervisor: Prof. J.P. Fouché**

**Co- Supervisor: Dr. L. Stroud.**

**January 2008**

**Dedicated in love and gratitude to**

*My late father, Terrence Raymond Phillips and my mother, Inez Jeanette Phillips as well to as my husband, Euan White.*

### Acknowledgements

I would like to express my sincere appreciation and thanks to the following people, who all freely gave their support and assistance in various ways throughout this study:

- My supervisor, **Prof. Paul Fouché**, for his support, guidance and expertise in the field of Psychofortology and Positive Psychology. I would like to thank him, most especially, for his patience and encouragement.
- My co-supervisor, **Dr. Louise Stroud**, for her constant support and guidance over my years of study and during this particular research study.
- **Mr. Danie Venter**, for his help, patience and expertise with the statistical analysis of this study.
- I would like to express my sincere gratitude to the Port Elizabeth Fertility and Wellness Centre, and especially **Sr. Helna Strydom** for her support and valuable assistance during this study.
- Thank you to the **women** who participated in this study. Their sacrifice of time to complete the questionnaires and their willingness to participate in this study is most appreciated.
- **Lynette Dean** for her initial guidance and professional insight at the start of this study.
- My mother, **Inez Phillips**, for her unfailing love, faith, support, encouragement and patience throughout my life. Thank you to my brother, **Mark Phillips**, for his encouragement.
- My husband, **Euan White**, for his love, encouragement and faith in me, and also for all the sacrifices made for me during this study.
- My parents-in-law, **Mervyn and Anita White**, for their encouragement and support.
- **Teresa Fogarty** and the staff at Fogarty's Bookshop for their support and encouragement. Thank you Charlotte, Rhona, Melanie, Chantel, Godfrey, Kate, Vicky, Cathy, Lynne and Roslyn.
- All my friends and Family, and especially, **Letitia and Thomas Jordaan**, **Liesl Jordaan** and **Marion Oliver** for their support.
- The **Psychology Masters class 2004/ 2005**- Alison, Vicky, Janine, Ewald, Wim, Sue, Hyacinth and especially my dear friends, Lizelle and Nolwazi.

- The **National Research Foundation (NRF)** for their financial contribution without which this research would not have been possible. The findings and opinions represented in this study are solely those of the author.
- I thank **God** for His constant guidance and ever present nearness through both the happy and challenging times throughout my life.

## Table of Contents

<b>Acknowledgements</b>	ii
<b>Table of Contents</b>	iv
<b>List of Appendices</b>	x
<b>List of Tables</b>	xi
<b>List of Figures</b>	xii
<b>Abstract</b>	xiii
<b>Chapter 1: Introduction and Problem Statement</b>	1
1.0 Introduction	1
1.1 General Orientation to the Study	1
1.2 Problem Statement and Rational for the Study	1
1.2.1 Infertility	2
1.2.2 Psychofortology as a Theoretical Model for the Purposes of Research	3
1.3 Aims of the Study	3
1.4 Outline of the Study	4
1.5 Conclusion	5
<b>Chapter 2: Infertility</b>	
2.0 Introduction	6
2.1 Infertility as a Cultural Narrative	6
2.2 Conception and Normal Reproduction	7
2.2.1 Reproduction in women: The production of eggs	8
2.2.2 Reproduction in men: The production of sperm	11
2.2.3 The sperm meeting the egg	13
2.2.4 Fertilisation of the egg by the sperm	13
2.2.5 Movement of the Embryo back down the fallopian tube	14
2.2.6 Implantation of the embryo	14
2.3 Infertility: Definitions and Incidence	14
2.4 The Causes of Infertility	15
2.4.1 Male factors influencing Infertility	17
2.4.2 Female factors influencing Infertility	17
2.4.3 Unexplained Infertility	19
2.5 The Treatment of Infertility	19
2.5.1 In Vitro Fertilisation-Embryo Transfer (IVF)	20

2.5.2 Gamete Intrafallopian Transfer (GIFT)	21
2.6 The Experience of Infertility Treatment	22
2.7 The Psychological Impact of Infertility	23
2.7.1 Emotional effects	23
2.7.2 Loss of Control	26
2.7.3 The Effect of Infertility on Self-esteem, Identity and Beliefs	27
2.7.4 Social Effects of Infertility	28
2.8 Infertility and Gender	28
2.9 Infertility and Stress	29
2.10 Infertility and Coping	29
2.11 Infertility and Well-being	30
2.12 Long-term effects of Infertility	31
2.13 Pregnancy after Infertility Treatment	31
2.1.4 Conclusion	32
<b>Chapter 3: Positive Psychology and Psychofortology</b>	<b>33</b>
3.0 Introduction	33
3.1 Defining Positive Psychology	33
3.2 The Pathogenic Paradigm	36
3.3 Health Psychology	39
3.4 The Salutogenic Orientation	39
3.4.1 The Sense of Coherence	42
3.4.2 The Fortigenic Orientation	42
3.5 Positive Psychology and Related Concepts	43
3.6 Positive Psychology and the Prevention of Illness	45
3.7 Research in the Field of Positive Psychology	46
3.8 Conclusion	47
<b>Chapter 4: Stress and Coping</b>	
4.0 Introduction	48
4.1 The Concept of Stress	48
4.1.1 Selye's Response-based Theory	49
4.1.2 The Stimulus-Based Model	49
4.1.3 The Interactional Model of Stress	50
4.1.4 The Conservation of Resources Model	51
4.1.5 The Salutogenic Perspective of Stress	51

4.2 Towards an all-encompassing definition of stress	52
4.3 Stress and Illness	53
4.4 Coping	54
4.4.1 Coping Types	56
4.4.1.1. Problem-focused Coping	56
4.4.1.2 Emotion-focused Coping	57
4.4.2 Coping Style	57
4.4.3 Coping Responses	58
4.4.4 Coping Resources	59
4.4.4.1 Models of Coping Resources	59
4.5 The Sense of Coherence	61
4.5.1 Generalised Resistance Resources (GRRs)	62
4.5.2 The Components of the SOC	63
4.5.3 The Sense of Coherence and Coping	64
4.5.4 The Development of the SOC in the Individual	66
4.5.5 The Research Value of the Sense of Coherence	67
4.5.6 Coping Resources and the Sense of Coherence	67
4.6 Conclusion	68
<b>Chapter 5: Subjective Well-Being</b>	
5.0 Introduction	69
5.1 Defining Subjective Well-being	69
5.2 The Components of Subjective Well-being	71
5.2.1 Satisfaction with Life (SWL)	72
5.2.2 Happiness	72
5.3 Theories of Subjective Well-being	75
5.4 Predictors of Subjective Well-being	77
5.4.1 Positive Self-esteem	77
5.4.2 Sense of Perceived Control	78
5.4.3 Extroversion	79
5.4.4 Optimism	79
5.4.5 Positive Relationships	80
5.4.6 A Sense of Meaning and Purpose	81
5.4.7 Resolution of Inner Conflicts or Low Neuroticism	82
5.5 Subjective Well-being and Other Influential Variables	83

5.5.1 Age	83
5.5.2 Gender	84
5.5.3 Race and Culture	84
5.5.4 Health	85
5.5.5 Marriage and Co-habitation	86
5.5.6 Money, Income & Wealth	87
5.5.7 Intelligence and Education	87
5.5.8 Work	88
5.5.9 Life Events	88
5.5.10 Physical Attractiveness	89
5.5.11 Pet ownership	89
5.6 Conclusion	90
<b>Chapter 6: Research Design and Methodology</b>	
6.0 Introduction	91
6.1 Primary Aims of the Research	91
6.2 Research Design and Methodology	92
6.2.1 Research Design	92
6.2.2 Participants and Sampling	93
6.3 Biographical Details	95
6.3.1 Age	95
6.3.2 Home Language	96
6.3.3 Employment Status and Job Description	97
6.3.4 Medical Reason for Infertility	98
6.3.5 Psychiatric Condition	99
6.3.5.1 Indication of the Time Period since Psychiatric Condition was Experienced	100
6.3.6 Method of Treatment For Infertility by means of Assisted Reproductive Technology	100
6.3.6.1 Length of Time for which ART was received	101
6.4 Research Measures	102
6.4.1 Biographical Questionnaire	103
6.4.2 The Coping Resources Inventory (CRI)	103
6.4.3 The Orientation to Life Questionnaire (SOC-29)	105
6.4.4 The Satisfaction with Life Scale (SWLS)	106



6.4.5 The Affectometer-2 Scale (AFM-2)	108
6.5 Procedure	109
6.6 Data Analysis	110
6.7 Ethical Considerations	112
6.8 Conclusion	113
<b>Chapter 7: Results and Discussion</b>	
7.0 Introduction	114
7.1 Results of the Measures	114
7.1.1 Coping	115
7.1.1.1.Coping Resources	115
7.1.1.2 Sense of Coherence	118
7.2 Subjective Well-being	121
7.2.1 The Satisfaction with Life Scale (SWLS)	122
7.2.2 The Affectometer-2 (AFM-2)	125
7.3 Conclusion	127
7.4 Cluster Analysis	127
7.5.1 Cluster One	130
7.5.2 Cluster Two	131
7.5.3 Cluster Three	131
7.5.4 Significance of Differences among the Clusters	132
7.6 Summary of the Coping of the Sample	132
7.7 Summary of the Subjective Well-being of the Sample	134
7.8 Conclusion	134
<b>Chapter 8: Conclusions and Limitations</b>	
8.0 Introduction	136
8.1 Aims of the Study Revisited	136
8.2 Conclusions Based on Results from the Present Study	136
8.2.1 Description of the Coping of the Sample	137
8.2.1.1 Description of the Coping Resources of the Sample	137
8.2.1.2 Description of the Sense of Coherence of the Sample	137
8.2.2 Description of the Subjective Well-being of the Sample	138
8.2.2.1 Description of the Satisfaction with Life	139
8.2.2.2 Description of the Life Happiness of the Sample	139

8.2.3 Description of the Patterns of the Coping and Subjective Well-being of the Sample	140
8.3 The Value of the Research	141
8.4 Limitations of the Research	142
8.5 Recommendations for Future Research	143
8.6 Conclusion	144
<b>References</b>	<b>145</b>

**List of Appendices**

<b>Appendix A:</b> Information Letter to Participants	171
<b>Appendix B.</b> Consent Form	173
<b>Appendix C.</b> Biographical Questionnaire	176
<b>Appendix D.</b> Glossary of Medical Terms	179

## List of Tables

### Table

1. Primary Causes of Infertility: Statistics from the HFEA (2005/ 2006)	16
2. Positive Psychology and Related Concepts	44
3. Theories of Subjective Well-being	75
4. Age Distribution of the Sample	96
5. Frequency Table: Home Language of Participants	96
6. Frequency Distribution: Employment Status of participants	97
7. Job Description of the Employed Participants of the Sample	97
8. Frequency Distribution: Medical Reason for Infertility	98
9. Frequency Distribution: Psychiatric Condition Experienced	99
10. Frequency Distribution: Time Period since Psychiatric Condition was experienced	100
11. Method of Assisted Reproductive Technology (ART)	101
12. Frequency Distribution: Length of Time for which ART was received	102
13. Range of Scores and Categories of the SWLS	107
14. Means and Standard Deviations of the Coping Resources Inventory (CRI)	116
15. Means and Standard Deviations of the Orientation to Life Questionnaire	118
16. Frequency Distribution and Levels of Satisfaction with Life	123
17. Means and Standard Deviations of Satisfaction with Life Scale	123
18. Levels of Happiness of Participants	126
19. Descriptive Statistics for Cluster Analysis	128
20. Descriptive Statistics for the Three Clusters	130
21. ANOVA results between cluster differences with regard to clustering variables	132

**List of Figures**

Figure 1: Basic Anatomical Drawing of Female Reproductive Organs	9
Figure 2: Basic Anatomical Drawing of Male Reproductive Organs	11
Figure 3: Cluster Analysis of the Four Standardised Measures	129

### **Abstract**

Infertility, the inability to conceive a child or carry a pregnancy to birth, is an age-old concern, the anguish and disappointment of which is universal regardless of the etiology. Although technological advancement in the field of reproductive medicine has led to the possibilities of near miraculous procedures, infertility treatment offers the hope of conception without guaranteeing it and places the couple under tremendous emotional and financial strain. A moderate amount of research has explored the coping of individuals and the couple experiencing infertility, but has been primarily orientated to a clinical and medical focus as well as an exploration of the pathological symptoms that individuals may experience. This study has adopted a psychofortigenic focus and explored and described the coping (i.e., the coping resources and sense of coherence) and subjective well-being (i.e., satisfaction with life and happiness) of women undergoing infertility treatment. An exploratory descriptive research design was used and the participants were selected by means of non-probability purposive sampling. The sample consisted of 61 women who were aged 30 years and older and required that they had received infertility treatment at a privately managed health care unit. Contextual and biographical data were gathered by means of a biographical questionnaire. Hammer and Marting's (1988) Coping Resources Inventory was used to assess the participant's coping resources. Antonovsky's (1987) Orientation to Life Scale was used to measure the construct of Sense of Coherence. The Satisfaction with Life Scale by Diener, Emmons, Larsen and Griffin (1985) was used to assess respondents' overall satisfaction with life while Kamman and Flett's (1983) Affectometer-2 (AFM-2) was used to measure participants' subjective happiness. The data were analysed using descriptive statistics and cluster analysis. The results of the CRI indicated a total coping resources score slightly below the mean of 50 as established by Hammer and Marting (1988). Results revealed that the highest mean score was obtained on the spiritual/philosophical subscale. Results from the SOC-29 indicated that the women sampled had an average Sense of Coherence. In terms of the construct of satisfaction with life as measured by the Satisfaction with Life Scale, the results indicated that the participants were slightly satisfied with their lives. Results from the AFM-2 revealed that the majority of participants experienced a below average feeling of happiness. Cluster analysis revealed three distinct clusters that differed significantly across the four measures.

This study, although limited in terms of sample size, highlighted the value of and need for further research relating to the constructs in the paradigm of psychofortology and infertility in South Africa. This study also places focus of the need for longitudinal studies, the incorporation of qualitative data and the necessity to include larger samples from diverse populations in South Africa.

Key Words: Infertility, Psychofortology, coping, coping resources, sense of coherence, subjective well-being, satisfaction with life and happiness.

Note: In this study, Psychofortology is conceptualised as consisting of two primary components namely: coping and subjective well-being. Coping comprises the constructs of coping resources and the sense of coherence. Subjective well-being comprises the constructs of satisfaction with life and life happiness.

## **Chapter 1**

### **Introduction and Problem Statement**

#### **1.0 Introduction**

This chapter provides a general orientation to the present study and briefly explains the rationale for the study. A concise overview of the literature is presented, followed by a description of the aims of the study. This chapter concludes with a brief description of chapters that follow.

#### **1.1 General Orientation to the Study**

This exploratory-descriptive study investigates the coping and subjective well-being of a sample of women who have received infertility treatment at a privately managed health care unit. Infertility has been clinically defined as the inability to conceive after 12 months of regular, unprotected intercourse or the inability to carry a pregnancy to live birth (Metzger, 1998, Reiss, 1998). Although primarily a medical condition, infertility has a significant emotional and psychological effect on those who have been trying unsuccessfully to conceive. Technologically advanced medical procedures, in many cases, offer hope of conception but often exacerbates the pressure and stress experienced by those undergoing infertility treatment (Monach, 1995). This study was conducted in order to gain insight into the way in which women diagnosed with, and undergoing treatment for infertility endure and manage the stress associated with infertility treatment. The emergent field of positive psychology and in particular, psychofortology, provides the contextual and theoretical framework in which the constructs of coping and subjective well-being has been explored. For the purposes of this study, psychofortology was divided into the two constructs of coping, which includes the sub-constructs of coping resources and the sense of coherence, and subjective well-being, which is in turn constituted by the sub-constructs of satisfaction with life and happiness.

#### **1.2 Problem Statement and Rationale for the Study**

A review of available literature has highlighted a need for South African research in the field of infertility with an emphasis on gaining greater insight into how women experiencing infertility and infertility treatment cope with and endure the many challenges and stressors that face them. Positive psychology and psychofortology are



relatively newer paradigms in psychology that focus on psychological well-being and health rather than on disease, mental illness and deficits. The emphasis on strengths, resources, capacities and abilities rather than weaknesses and pathology was the primary reason that the researcher chose the approach of psychofortology as a theoretical context for the purposes of this study.

### 1.2.1 Infertility

Infertility has always existed, its story told in ancient texts and religious writings from all cultures. Every culture has tried to overcome this state of childlessness with its own set of customs, folklore and ritual (Leiblum, 1997a) and although modern medicine and science has played a role in banishing some of the superstition that surrounds infertility, it remains a culturally embedded concern mediated by that particular society's idea of motherhood and family (Jennings, 1995).

Historically, the responsibility and therefore, the fault, of childlessness or miscarriage was placed solely on the woman (Doyal, 1995). Despite the fact that there is a growing awareness of the impact of infertility on the couple system, in many cases the physical, psychological and emotional brunt of infertility is borne primarily by the woman (Doyal, 1995; Helman, 2001).

Infertility is clinically defined as the inability to conceive after 12 months of regular, unprotected intercourse or the inability to carry a pregnancy to live birth (Metzger, 1998, Reiss, 1998). With approximately 10-12% of couples affected by infertility, it appears that it is becoming increasingly prevalent (Leiblum, 1997a). According to the Port Elizabeth Infertility and Wellness Clinic (2004), 10-15% of all married couples suffer from infertility. Advanced technological procedures in the form of Assisted Reproductive Technology (ART) methods offer hope without the guarantee of conception and often exacerbate the psychological distress and feelings of powerlessness experienced by those diagnosed with infertility (Monach, 1995).

While recent research conducted by Ferreira (2005; 2007) explored the dynamics of the couple system experiencing infertility and infertility treatment, there remains a dearth of South African research in the field of infertility and in particular, research with a psychofortigenic focus. This lack of research and an interest in understanding the unique methods of coping and subjective well-being of women experiencing infertility has prompted the researcher to undertake this study. The definitions and theory of infertility is discussed in greater detail in Chapter 2.

### 1. 2.2 Psychofortology as a Theoretical Model for the Purposes of Research

Positive psychology, founded partially by Martin Seligman (1998), heralded a new paradigm shift for those in the field of psychology and provided an alternate focus to the pathogenic and disease-orientated biomedical perspective of traditional psychology. While the biomedical model had provided insight and a foundation of research regarding the theory and observation of mental illness and diminished capacities, it had become increasingly apparent that this view of vulnerabilities limited the understanding of positive human functioning (Wissing & Van Eeden, 1997). Strümpfer (1995), building on the salutogenic perspective of health, promoted a more encompassing theory of fortigenesis or origins of strength to include all aspects of those resources that facilitate the enhancement of psychological strengths. Wissing and van Eeden (1997) suggested the term psychofortology in the interest of developing a science focussed on the understanding of psychological well-being and the improvement of resources and quality of life. A number of South African researchers have used fortigenic variables such as coping resources, sense of coherence, purpose in life, and subjective well-being in their studies (Brown, 2002; Cairns, 2002; Ferreira, 2007; Gal, 2004; Hatuell, 2004; Smith, 2006; Vorster, 2002).

This section briefly introduced the concept of psychofortology as theoretical model for research. The concept is described in more detail in Chapter 3.

### **1.3 Aims of the Study**

In the broadest terms, this study aimed to explore the psychofortology of women who were undergoing infertility treatment at a privately managed health care unit. For the purposes of this study, psychofortology was conceptualised in terms of the constructs of coping and subjective well-being. Coping as a construct, in relation to this study, was explored under the sub-constructs of coping resources and the sense of coherence while the construct of subjective well-being was divided into the sub-constructs of satisfaction with life and happiness.

The primary aims of the research were:

1. To explore and describe the coping of women currently undergoing infertility treatment. This aim specifically entails the following:

To explore and describe the coping resources of women currently undergoing infertility treatment.

To explore and describe the sense of coherence of women currently undergoing infertility treatment.

2. To explore and describe the subjective well-being of women currently undergoing infertility treatment. This aim specifically entails the following:

To explore and describe the satisfaction with life experienced by women currently undergoing infertility treatment.

To explore and describe the life happiness of women currently undergoing infertility treatment.

3. To explore and describe the patterns of coping resources, sense of coherence, satisfaction with life and happiness of women currently undergoing infertility treatment at a privately managed health care unit.

#### **1.4 Outline of the Study**

Chapter 1 provides an introduction to the present study and provides a concise overview of the theoretical context within which this research was conducted. Chapter 2 explores the medical and psychosocial aspects of infertility. The definitions and causes of infertility are discussed and attention is paid to the normal process of reproduction. This chapter also considers the choices open to couples experiencing infertility in terms of assisted reproductive technology (ART). Chapter 3 introduces the emerging field of positive psychology with its decided emphasis on human strengths and resources in contrast to the pathologically focussed traditional approach to psychology. Chapter 4 discusses the concepts of stress, coping and coping resources and also explores the concept of the sense of coherence. Chapter 5 explores construct of subjective well-being by reviewing the theory and research in this field. A specific focus is placed on satisfaction with life and happiness, which are two aspects of subjective well-being that, for the purposes of this study form the sub-constructs of subjective well-being. Chapter 6 describes the research process by providing details of the research design and methodology used for this study. The sampling procedures and measures used for the study are also discussed. Chapter 7 presents the results obtained from this study and includes a brief discussion of these results. Finally, Chapter 8 offers an evaluation of the study by examining the implications of the results, limitations, value of this study and providing recommendations for future research in the field of infertility and psychofortology.

## **1.5 Conclusion**

This introductory chapter provided a brief overview of the context in which the present study will be conducted by briefly introducing the field of infertility and the psychofortigenic concepts of coping (i.e., coping resources and the sense of coherence) and subjective well-being (i.e., satisfaction with life and happiness). The aims for the study were presented and brief descriptions of the chapters to follow were given. The following chapter discusses infertility in greater detail.

## **Chapter 2**

### **Infertility**

#### **2.0 Introduction**

Infertility is becoming an increasingly common concern among couples of reproductive age. The inability to conceive is due to a number of factors and although primarily a medical condition, it is a condition that has a tremendous psychological effect on the individual and couple system. The progress of technology in the form of assisted reproductive technologies (ART), for example, in vitro fertilisation (IVF) and gamete intra-fallopian transfer (GIFT), have offered hope to many wishing to conceive (Cooper-Hillbert, 1998; Monach, 1995). This chapter explores the cultural narrative of infertility, the incidence, causes and effects of infertility on the individual and couple system. Two of the assisted reproductive technologies (ART); namely IVF and GIFT, are explored and discussed.

#### **2.1 Infertility as a cultural narrative**

Fertility and the propagation of name and lineage by means of a biological heir are themes that flood the age-old cultural narratives of history, religion and mythology. The ability to conceive and bear a child is historically linked with prestige and power, with identity and generativity; while infertility, in contrast, has been associated with shame, accursedness, disease and defect (Daniluk, 1988; Helman, 2001).

Boivin and Kentenich (2002) noted that the desire for a child is a result of individual development moderated by the influence of the “individual personality; sociocultural processes; economic factors; individual biographical changes; fate; interpersonal processes between partners and family dynamics” (p.1). While infertility is a deeply personal concern for the individual and couple system, it is often one that is mediated by cultural expectations (Jennings, 1995).

Parenthood, family and the ability to conceive and bear children have different connotations and expectations for different cultures (Collins, 1994; Cooper-Hilbert, 1998; Shefer, Boonzaier & Kiguwa, 2006). The degree of importance attributed to these social factors may have a profound effect upon the individual or couple trying to conceive. Parenthood is regarded by many societies as essential for personal fulfillment, social acceptance, achievement of adult status, religious membership, sexual identity and psychological adjustment (Daniluk, 1988). Motherhood and mothering in particular, possibly more than any other role in society, has been

constructed around societal expectations and cultural significance (Bassin, Honey & Kaplan, 1994; Braverman, 1989; Glenn, 1994; Kruger, 2006, Parker, 1997). Helman (2001) noted that many cultures have a series of rituals, prayers or special precautions to help a woman successfully conceive and that these cultures provide a plethora of explanations as to the origin of the infertility and how to counter its effects. Many of these explanations place the blame and responsibility on the individual's behaviour, the natural world, the malevolence of other people, supernatural forces or perceive it to be a punishment from the gods or religious deities of that culture (Helman, 2001). Traditionally, the responsibility for childlessness or the inability to conceive in both physical and psychological domains was placed solely on the woman and the penalty for failing to conceive ranged from abuse, divorce, abandonment, being marginalised, ostracised to, as in some cultures, death (Cooper-Hilbert, 1998; Doyal, 1995; Leiblum, 1997a).

Despite major social changes in the nature of women's lives, the status of "mother" remains in most cultures to be an essential element in the definition of a "normal" adult female (Doyal, 1995; Kruger 2006). The socially constructed ideal and identity of the woman as natural mother and the "one who nourishes her child with the riches of her body" is thrown into question when faced with the possibility of infertility (Helman, 2001, p.124). Similarly, the symbolic meaning of the pregnant body as that which is the epitome of nurturance, naturalness, and health, provides a cultural ideal with which in comparison, infertile women may interpret themselves, their bodies and their identities as being defective and abnormal (Helman, 2001; Kruger, 2006). In small-scale societies, the barren woman is often seen as someone who is both personally unfulfilled and socially incomplete (Helman, 2001). Doyal (1995) noted that the uneducated woman living in a small community where there are few opportunities and options other than motherhood is more likely to suffer from social pressure from both her husband and her family. This social pressure may in turn have a detrimental effect on the well-being of the woman and may taint the sense of naturalness of conception. The following section provides a discussion of natural conception and the processes involved in normal human reproduction.

## **2.2 Conception and Normal Reproduction**

Metzger (1998) commented that nature provides ample chance and opportunity for conception through excesses by providing over 400 ovulations during the lifetime of

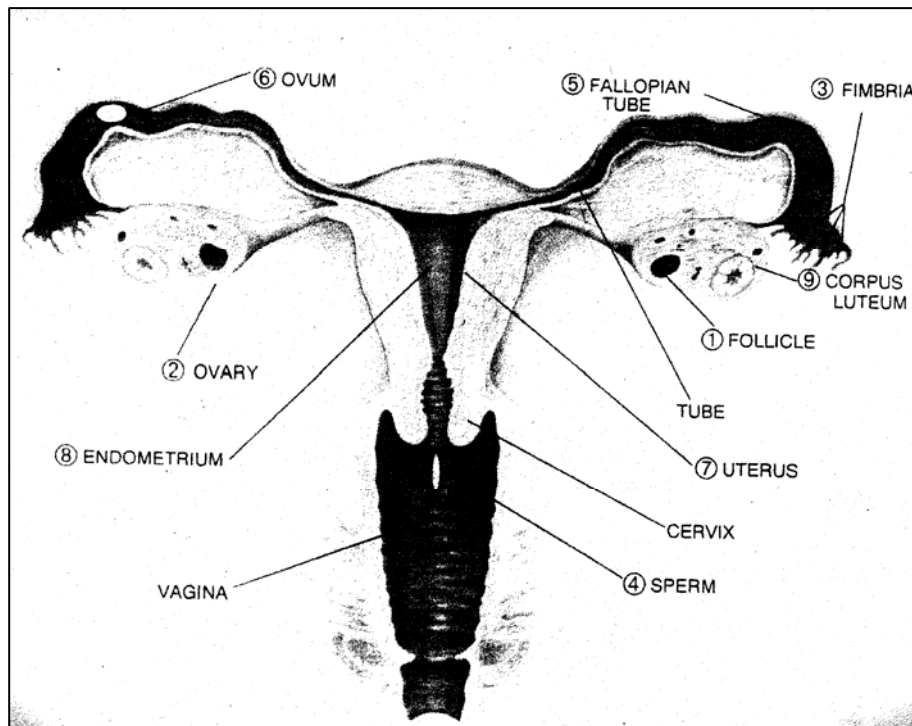
the average fertile woman and millions of sperm in a single ejaculate. Yet Dooley (2006) noted that, despite this apparent abundance of reproductive material, humans are one of the least fertile creatures with only a short time during the monthly menstrual cycle within which conditions for conception are favourable. Thus, the process of human reproduction is exquisitely intricate and complex. To speak of the miracle of conception or birth is no exaggeration, as a complicated sequence of events needs to occur to ensure the chance meeting of the two cells, the egg and sperm cells, that will ultimately lead to the origin of new life. Normal conception is dependent on an unproblematic journey of sperm from the male testes to egg cell or oocyte in the female uterus. For this to occur, a number of hormonal and biological processes need to follow sequentially to allow for a reasonable possibility that a sufficient amount of normal, motile sperm will make the arduous journey to the fallopian tubes where an egg cell has been released through ovulation (Davajan & Israel, 1991; Tortora & Grabowski, 1996; 2003). Fertilisation of the egg cell may take place, after which, the fertilised cell will implant itself in the uterine lining that has been sufficiently primed for this specific purpose of implantation (Davajan & Israel, 1991; Metzger, 1998; Tortora & Grabowski, 2003). Any alteration or blockage of this sequence could result in a state of infertility (Dooley, 2006).

In order to understand infertility, it is necessary to understand the “normal” process of reproduction and the processes that ultimately lead to the meeting of the sperm and egg cell and the beginning of new life. According to Dooley (2006), there are six essential stages involved in reproduction. These are briefly described below:

### 2.2.1 Reproduction in women: The production of eggs

The female reproductive cycle is primarily controlled by hormones and determined by the cyclic interaction and biofeedback mechanisms of the hypothalamus, pituitary gland, ovaries and endometrium or uterine lining (Metzger, 1998; Tortora & Grabowski, 2003). Figure 1 provides a basic anatomical drawing of the female reproductive organs. The hypothalamus and the pituitary gland, not shown in Figure 1, are glands situated in the brain (Tortora & Grabowski, 2003).

Figure 1

Basic Anatomical Drawing of Female Reproductive Organs<sup>1</sup>

Human egg cells or oocytes are produced by the almond-shaped paired glands called the ovaries situated in the lower abdomen of the female body (Dooley, 2006; Tortora & Grabowski, 1996; 2003). Women are born with their full quota of oocytes, approximately 200,000 to 2 million primary oocytes in number that will last their reproductive lifetime (Metzger, 1998). No new oocytes are produced after birth but a number of these cells begin to die off so that at the age of puberty, the young girl has approximately 40 000 egg cells remaining. Of these, only about 400 will mature and ovulate during a woman's reproductive lifetime (Dooley, 2006). The rest of these egg cells degenerate and undergo a process of cell death or atresia<sup>2</sup> (Tortora & Grabowski, 2003)

Each reproductive cycle takes approximately 28 days and involves the processes of egg cell production (oogenesis) and the preparation of the uterus to receive a fertilised ovum (Tortora & Grabowski, 1996). On the first day of the woman's menstrual cycle, the day on which menstrual bleeding occurs, the hypothalamus region of the brain signals the pituitary gland to secrete a hormone called follicle-stimulating hormone

<sup>1</sup> Source: Port Elizabeth Infertility and Wellness Clinic. (2004).

<sup>2</sup> Atresia refers to the degeneration and re-absorption of an ovarian follicle before it fully matures and ruptures (Tortora & Grabowski, 1996).



(FSH) (Metzger, 1998; Whitworth; 1996). The release of this hormone begins the start of the 28-day reproductive cycle by stimulating the development of the egg-containing follicles in the ovaries and initiating the process of egg maturation. Approximately 20 egg cells within these follicles begin to develop at the start of this process and begin to produce the hormone oestrogen. The secretion of oestrogen signals the pituitary gland to reduce the amount of FSH being secreted. By day six of the cycle, one follicle in one of the ovaries has outgrown all the other developing follicles and becomes the dominant follicle (Dooley, 2006; Tortora & Grabowski, 1996; Whitworth, 1996). The dominant follicle continues to secrete oestrogen and causes the pituitary to further decrease the levels of FSH until eventually the decreased levels of FSH cause the non-dominant follicles to stop growing and die. The ovulation of both ovaries, although not impossible, is not common and the fostering of a dominant follicle and the death of non-dominant follicles decrease the possibility of multiple pregnancies (Dooley, 2006; Whitworth, 1996). The increased levels of oestrogen in the blood stream also signals the pituitary gland to release the luteinising hormone (LH), the sudden surge of which around day 12, causes the follicle containing the dominant egg cell to grow rapidly. By approximately day 14, the egg cell has reached maturity and ovulation occurs by the eruption of the follicle and the release the egg cell (Metzger, 1998). While generally occurring around day 14, the exact date of ovulation often varies from month to month and may be different for each individual (Dooley, 2006). The egg cell is then gently swept into the opening of the nearest of the two fallopian tubes situated on either side of the uterus. Microscopic hairs on the inside of the fallopian tube, called cilia, serve to carefully sweep the egg cell down towards the uterus (Tortora & Grabowski, 1996; 2003). After the release of the ripened egg cell, the ruptured follicle that had previously housed the egg now forms the corpus luteum<sup>3</sup>. This structure produces the hormone progesterone and, together with oestrogen, is instrumental in stimulating the thickening of the uterus (womb) lining. This lining, termed the endometrium, is the place in which a fertilised egg cell embed itself and from which the developing embryo will receive its nutrients (Dooley, 2006; Metzger, 1998; Tortora & Grabowski, 2003). If intercourse has taken place in the 48 to 72 hours prior to ovulation, there may be sperm in the fallopian tube and a possibility for fertilisation of the egg cell

---

<sup>3</sup> The corpus luteum refers to the yellow gland in the ovary formed when a follicle has released its oocyte (Tortora & Grabowski, 1996).

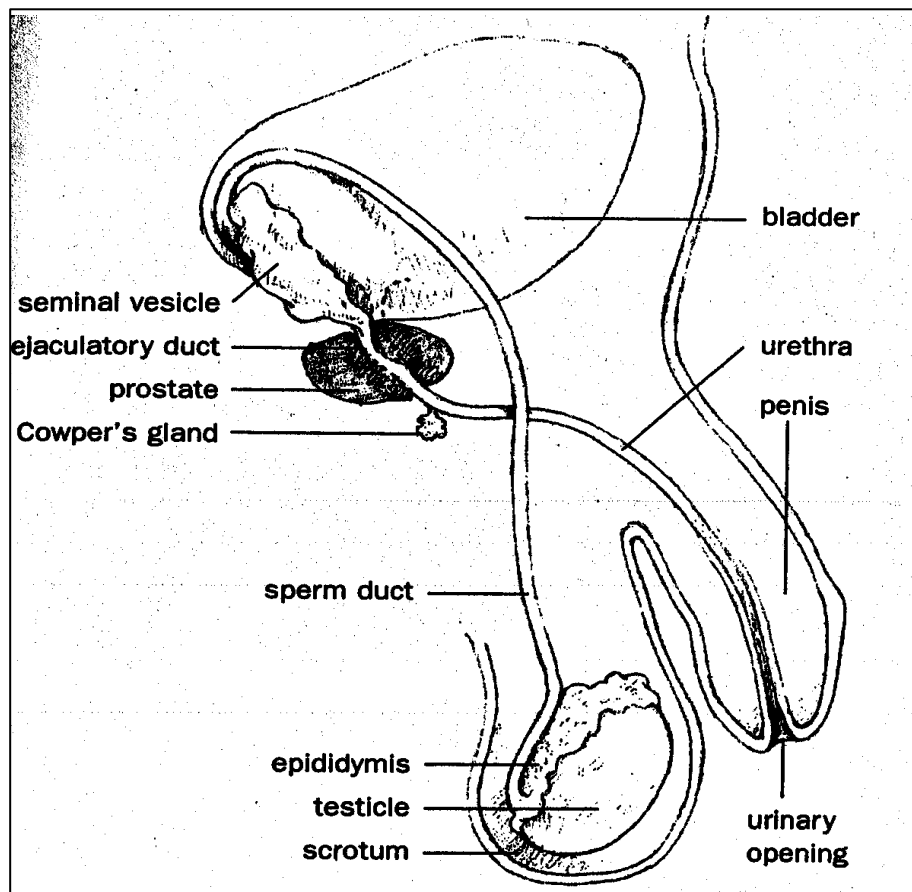
exists (Cooper-Hillbert, 1998). However, if the egg cell is not fertilised, the levels of progesterone will decline, the endometrium will loosen from the wall of the uterus and be shed as part of menstruation, the egg cell disintegrates and menstruation will occur and signal the start of a new reproductive cycle (Dooley, 2006; Metzger, 1998).

### 2.2.2 Reproduction in Men: The Production of Sperm

Many aspects of the male reproductive system are analogous to the female reproductive system (Cooper-Hillbert, 1998; Dooley, 2006). Figure 2 presents a basic anatomical drawing of the male reproductive organs. The hypothalamus and pituitary gland, which also forms part of the male reproductive system, are not depicted in Figure 2. These structures are found in the brain (Tortora & Grabowski, 2003).

Figure 2

#### Basic Anatomical Drawing of the Male Reproductive Organs<sup>4</sup>



<sup>4</sup> Source: Madaras, L., & Madaras, A. (2007)

In contrast to the female reproductive system, there is no monthly cycle and instead of the allotted 400 eggs produced during the female's reproductive years, men produce millions of sperm every day from the age of puberty (around 13 years) until death (Cooper-Hillbert, 1998; Dooley, 2006). The average size of each testicle is approximately 5cm in length and is contained in a protective sac found outside the body called the scrotum. The situation of the testicles outside of the body promotes optimal conditions for the production of sperm as the temperature within the testicle is about 2°C lower than the core body temperature. It also provides a barrier between the blood and the testicle and prevents the production of antibodies to the sperm (Bernstein & Siegel, 1991; Tortora & Grabowski, 2003). The interior of each testicle is divided into 250 separate lobes. Each of these lobes are filled by a series of long convoluted tubes called the seminiferous tubules, and it is within this tubules that sperm production occurs (Dooley, 2006). Follicle-stimulating hormone (FSH) is responsible for the production of sperm while LH stimulates the production of the hormone testosterone (Dooley, 2006; Tortora & Grabowski, 1996).

The sperm gradually move from the testis towards the epididymis, the organ in which they are stored and nourished until they mature. The fully matured sperm then move into the vas deferens, a tubal structure that connects the epididymis with the seminal vesicles, where they are stored. Just before ejaculation, the sperm from the seminal vesicles combine with a sticky fluid from the prostate gland to create the semen, which may then, through intercourse, be deposited into the vagina (Bernstein & Siegel, 1991; Cooper-Hillbert, 1998; Dooley, 2006). Sperm generally forms less than 20 % of the of the total male ejaculate, but it is not uncommon for there to be approximately 300 million sperm cells within 3-5ml of ejaculate (Dooley, 2006).

The entire process of sperm production, or spermatogenesis, takes approximately 72 hours from initial cell division to maturation (Cooper-Hillbert, 1998). Spermatogenesis is a very sensitive process and one that may easily be influenced by exposure to chemicals and changes in temperature. Sperm cells are particularly sensitive to prolonged exposure to heat. It is possible that a poorer quality of sperm may be ejaculated for two to three months following exposure to these suboptimal conditions (Bernstein & Siegel, 1991; Cooper-Hilbert, 1998). Sperm counts may decrease with frequent ejaculation and may rise after 2 to 7 days of abstinence (Cooper-Hilbert, 1998).

### 2.2.3. The sperm meeting the egg

It is imperative that the sperm cell meets the egg cell within 24 hours of ovulation for fertilisation to occur, as after this period, the unfertilised egg cell begins to disintegrate (Dooley, 2006; Metzger, 1998). At the moment of ejaculation during sexual intercourse, about 300 million sperm are deposited into the vagina. The vagina's acidic level or pH, a protective defence against infections, proves as a hazard to the sperm cells and many are killed off before reaching the cervix (Davajan & Israel, 1991). Those sperm that manage to reach the cervix, the opening to the uterus found at the top of the vagina, must navigate their way through the cervical mucus. One of the functions of this mucus is to help prevent the weaker and deformed sperm from entering the uterus and eliminates the possibility of a poor quality sperm cell from fertilising the ovum (Bernstein & Siegel, 1991; Cooper-Hillbert, 1998; Tortora & Grabowski, 2003; 2006).

Once inside the uterus, the powerful muscular contractions of the uterine walls help propel the healthy sperm further into the uterus and up the fallopian tubes. It takes approximately half an hour for the sperm to travel the roughly 10cm distance from the entrance of the uterus to the fallopian tube but by now the number of remaining viable sperm has decreased from 300 million at the moment of ejaculation to 300 sperm (Dooley, 2006). Healthy sperm can survive in the fallopian tubes for several days and it is therefore possible for fertilisation to occur for up to three days after intercourse, even if intercourse took place just prior to ovulation (Bernstein & Siegel, 1991; Dooley, 2006).

### 2.2.4 Fertilisation of the egg by the sperm

The zona pellucida, or protective covering, around the egg cell ensures that only one sperm is able to penetrate and fertilise the ovum. This thick covering is much thicker than that of the head of the sperm, and, as a result, the weaker sperm fail to attach themselves and merely ricochet off the surface (Tortora & Grabowski, 1996; 2003; Whitworth, 1996). It is then only a healthy, strong sperm cell that will ultimately penetrate this covering. After the initial penetration and the implantation of the head of the sperm in the egg cell, the sperm sheds its tail and releases the genetic contents from its head into the nucleus of the egg cell (Dooley, 2006). The egg cell, now fertilised, contains all of the genetic material needed to develop into a baby (Metzger, 1998).

#### 2.2.5. Movement of the embryo back down the fallopian tube

The fertilised egg, or zygote, helped by contractions of the fallopian tube now begins to move along the fallopian tube towards the uterus (Dooley, 2006). Rapid cell division begins approximately 24 hours after fertilisation. The single cell divides in an exponential manner, so that by the second day after fertilisation, there are four cells and by the end of the third day, there are 16 cells. The successful, continuous process of cell division results in a solid sphere of many cells (Tortora & Grabowski, 1996; 2003). The lining of the uterus, the endometrium, which has grown thicker since ovulation, is now primed for the implantation of the embryo (Whitworth, 1996).

#### 2.2.6. Implantation of the embryo

Once inside the uterus, the embryo becomes embedded in the thickened endometrium. This process is called implantation (Tortora & Grabowski, 1996) The implantation triggers the release of the hormone called human chorionic gonadotropin (hGC), which serves to maintain the pregnancy for the first 12 weeks by prompting the increase of the production of progesterone. The presence of the hormone hCG in a urine sample for a pregnancy test indicates pregnancy (Tortora & Grabowski, 2003; Whitworth, 1996). Hormonal imbalances could prevent the proper implantation of the embryo in the endometrium and could lead to a miscarriage (Tortora & Grabowski, 2003).

### **2.3 Infertility: Definitions and Incidence**

Infertility is clinically defined as the inability to conceive after 12 months of regular, unprotected intercourse or the inability to carry a pregnancy to live birth (Metzger, 1998, Reiss, 1998). The World Health Organization (WHO, 1991) has recently advocated the use of a definition that regards infertility as the absence of conception after 24 months of unprotected intercourse (Rowe, Comhaire, Hargreave & Mellows, 1993). The discrepancy in definitions occurs because of the importance in clinical practice to begin treatment as soon as possible, whereas the second definition is aimed at improving epidemiological research and reducing the amount of false positives (Larsen, 2005). For the purposes of this study, the clinical definition of infertility, that is, the inability to conceive after 12 months of unprotected intercourse will be used. It is estimated that between 8% and 12% of couples in first world countries experience some period of infertility during their reproductive lives (WHO,

1991). The incidence of infertility in third world countries is much higher, and is as high as 50% of the female population in some Sub-Saharan African countries (WHO, 1991). Leiblum (1997) cited research conducted by the National Centre for Health Statistics in the United States that indicated that the percentage of childless, infertile couples increased from 14.4% in 1965 to 18.5 % in 1995. The incidence of infertility has increased to the extent that 1 in 12 couples in the United States experience difficulty in conceiving, while 1 in 7 couples in their late 30's and early 40's may be affected (Cooper-Hillbert, 1998). The Port Elizabeth Infertility Unit estimated that as many as 15 percent of married couples are affected by infertility (Patients information guide, no date).

Leiblum (1997) noted that the actual incidence of infertility in the population is difficult to determine with absolute certainty, a reason being that “infertility represents a continuum ranging from absolute sterility (complete infertility) through subfertility to normal fertility” (p.9). Leiblum (1997) indicates that approximately 5% of couples are affected by complete infertility or sterility. Whitworth (1996) further differentiated between primary and secondary infertility. A diagnosis of primary infertility is considered when the couple has not been able to conceive a pregnancy while secondary infertility refers to a couple that has at least conceived one pregnancy prior to a current state of infertility. Subfertility occurs as a result of both partners having marginal infertility; for example, if the woman ovulates irregularly and the male has a relatively low sperm count (Stoppard, 2001).

#### **2.4 The Causes of Infertility**

Metzger (1998) remarked that the current “infertility epidemic” is the “unforeseen consequence of several socioeconomic trends” (p.5) included in which is the progress of reliable contraception, the feminist movement, and an economy that pushed women into the labour market during their most fertile years. Monach (1995) also suggests the possibility of environmental pollutants, the use of illicit drugs or abuse of coffee, tobacco and alcohol, and the increase in the incidence of abortion as being contributing factors to infertility. A more liberal and permissive attitude towards sexuality as a result of the sexual revolution has resulted in an increase in the prevalence of sexually transmitted infections; which in turn may have a detrimental effect on the fertility of the individual. In addition, fertility in women decreases substantially after the age of 35 and as they grow older (Dooley, 2006). This occurs as

a result of an age-related decline in her ovarian endowment and the decrease in the number and quality of egg cells (Davajan & Israel, 1991; Metzger, 1998).

While the abovementioned factors can be seen to be cultural factors influencing the incidence and prevalence of infertility, it is primarily a medical condition. Far from exclusively being a female concern, fertility is now considered to be a condition affecting the couple as a system rather than placing the responsibility and blame on an individual in the system. Davajan and Israel (1991) divided the etiology of infertility into four major categories, namely, the female factor, the male factor, combined male and female factors and infertility of undetermined cause. It has been found that infertility is rarely the result of the impact of one of these factors but is more often the result of the interplay of multiple origins (Cooper-Hillbert, 1998; Davajan & Israel, 1991). Stoppard (2001) approximated that 20-30% of infertility problems are “shared” by both the female and male partner.

According to recent statistics presented by the Human Fertilisation and Embryology Authority (HFEA, 2005/2006), the causes of infertility in patients having IVF and ICSI treatment in the United Kingdom, are represented as follows:

Table 1

Primary Causes of Infertility: Statistics from the HFEA (2005/2006)

Causes of Infertility of Patients Presenting to clinics for IVF/ICSI	Incidence (%)
Male factor	32
Unexplained infertility	18.7
Multiple factors female and male	17
Tubal disease	16.7
Ovulatory disorders	4.9
Multiple factors female only	4.6
Endometriosis	3
Uterine factor	0.3
Other causes	2.9

Obtaining South African statistics of similar nature proved to be a challenge. The factors affecting male and female infertility will be briefly discussed below.

#### 2.4.1 Male Factors influencing Infertility

Approximately 32-35% of infertility problems are attributed to the male partner (Dooley, 2006). Among the causes of male infertility are abnormal sperm motility (asthenospermia), antisperm antibodies, hormonal abnormalities, retrograde ejaculation, suboptimal sperm (oligospermia) and lack of sperm (azoospermia) (Davajan & Israel, 1991; Dooley, 2006; Metzger, 1998; Monach, 1995). Semen analysis is the primary screening test for male infertility and the results often provide valuable clinical information for diagnosis and treatment. The test typically investigates sperm count, sperm motility or movement, sperm morphology, clumping or agglutination of sperm, total volume of semen, white and red blood cell counts and the pH of the semen. The results of the semen analysis provide an indication of possible infections (e.g., Rubella or German measles, or bacterial infections affecting the genitourinary tracts) and genetic defects (e.g., chromosomal disorders) (Bernstein & Siegel, 1991). The quality and quantity of sperm may be negatively affected by age and lifestyle factors such as stress, alcohol consumption, smoking and diet (Metzger, 1998).

Other causes of male infertility include testicular injury, which can affect the release of the hormones produced by the testes as well as the quality and quantity of sperm produced. This type of damage could be the result of physical injury or an infection (Bernstein & Siegel, 1991; Dooley, 2006). Hormonal imbalances caused by medical conditions that are unrelated to fertility, for example, diabetes, may have an effect on the reproductive system (Tortora & Grabowski, 2003). Obstructions of ducts and tubes of the male reproductive system caused by infections, and physiological conditions such as retrograde ejaculation can influence fertility (Davajan & Israel, 1991).

#### 2.4.2 Female Factors influencing Infertility

Female causes of infertility include adhesions or the formation of scar tissue as a result of pelvic operations or infections, blocked fallopian tubes, endometriosis (a condition in which the cells of the womb lining grow outside the womb), hormonal abnormalities, irregular ovulation, failure to release an egg (anovulation), repeated miscarriage, inadequately prepared uterine lining (luteal phase defect), cervical mucus that prohibits the entry of sperm into the uterine cavity (cervical factor) and



fallopian tubes and maternal age of greater than 35 years (Davajan & Israel, 1991; Metzger, 1998; Monach, 1995).

The fallopian tubes are very delicate structures with about the same thickness as the lead of a pencil (Dooley, 2006) and thus it very easily may become blocked and prevent the progress of the egg or sperm along the tube for fertilisation. Blockages in the fallopian tubes are often the result from scarring from an infection, previous abdominal surgery and endometriosis (Davajan & Israel, 1991; Tortora & Grabowski, 2003).

Ovulatory disorders may be related to hormonal imbalances and menstrual irregularities. Polycystic ovarian syndrome (PCOS) is a hormone related ovulatory condition that disrupts the normal ovulatory cycle and in severe cases, inhibits ovulation completely. It is a mixed group of different signs and symptoms that form a disorder and has a wide spectrum of presentations ranging from mild to severe. Polycystic ovaries is a term that describes ovaries that contain very small cysts just beneath the surface of the ovaries. These cysts contain egg cells that have not matured properly due to hormonal imbalances (Cooper-Hillbert, 1998; Davajan & Israel, 1991).

Endometriosis is considered to be a fairly common condition in women of a reproductive age (Davajan & Israel, 1991; Dooley, 2006). While it does not directly cause infertility, it can lead to significant problems with ovulation, the movement of the egg along the fallopian tubes and with fertilisation. It is a condition in which the cells lining the inside of the uterus (the endometrium) become established outside of the uterus, usually in the fallopian tubes, ovaries, bladder or bowel. These alien tissues then behave as they normally would as if they were in the uterus. As the hormonal changes take place in the body, these tissues are also affected, stimulated, build up and bleed monthly with the normal menstrual cycle. Endometriosis can lead to inflammation and scarring which in turn may lead to blockages (Davajan & Israel, 1991; Dooley, 2006; Stoppard, 2001; Tortora & Grabowski, 2003).

Cervical factors are related to the 'hostility' of the mucous secreted by the glands lining the cervix. On occasion it may contain antibodies that interfere with the sperm's motility and impedes their journey up the cervical canal (Davajan & Israel, 1991; Dooley, 2006).

### 2.4.3 Unexplained Infertility

The term unexplained infertility refers to any couple who have not conceived and for which no medical cause has been found after a full investigation of both partners (Dooley, 2006). Davajan and Israel (1991) noted that there are approximately 2-15% of couples for whom no medical cause or physical abnormality can be found to be a factor in the cause of their infertility. This diagnosis is particularly frustrating and stressful for couples and physicians alike as with no identifiable cause of infertility, there is difficulty in determining the best means of treatment (Cooper-Hillbert, 1998; Whitworth, 1996).

The question of the extent to which psychological factors contribute to the couple's infertility is considered to be a controversial one (Monach, 1995). Terms used to describe this area of infertility include unexplained infertility, psychosomatic, psychogenic or functional infertility (McShane, 1997; Monach, 1995). It has recently been generally accepted that there is little evidence to support the hypothesis that psychological factors cause infertility (Brand, Roos & van der Merwe, 1982; Brinsmead, Guttman, Oliver, Stanger, Clark & Adler, 1986; Connolly, Edelman, Cooke & Robson, 1992; Paulson, Haarman, Salerno & Asmar, 1988). Research has pointed to the link between stress and reproductive functioning (Metzger, 1998, Monach, 1995) but it is unclear as to the role that stress plays as a causal factor rather than a result of infertility. Research conducted by Wu and Gocial (1988) has also shown that couples with unexplained infertility of less than three years are 'normal' in terms of reproductive functioning and the majority will conceive within the following two years.

This section explored the causes associated with infertility. The following sections concentrates on the treatment options for infertility with a particular focus on the IVF and GIFT procedures.

## **2.5 The Treatment of Infertility**

Leiblum (1997a) remarked that the field of reproductive medicine is one of those fields of science where almost the unthinkable becomes doable. The past two decades have heralded great advances in the field of assisted reproductive technology (Kentenich, 2002). While infertile couples in the not too distant past could only consider the possibilities of adoption or a life without children, couples today are presented with a staggering amount of technological options, all proffering the hope

of conception and birth. In vitro fertilization-embryo transfer (IVF), intrauterine insemination (IUI), gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT) and subzonal insemination (SUZI) are some of the ways in which nature is 'helped' to promote conception (Davajan & Israel, 1991; Leiblum, 1997). New research and methods of micromanipulation have even made it possible to engineer the passage of a single sperm cell into a single oocyte (Leiblum, 1997). These technologies are suitable only for a small percentage of infertile women and an even smaller percentage are able to afford the procedures (Doyal, 1995). The majority of women experiencing infertility will therefore remain childless. This is especially true for the millions of women in third world countries for whom infertility may be a cause of sorrow and social exclusion (Doyal, 1995). In most third world countries, the situation regarding cost and inaccessibility of services is aggravated by the low priority of conception and the higher focus of contraception and lower birth rates (Doyal, 1995; Swartz; 2003).

The Port Elizabeth Infertility and Wellness Unit utilises IVF and GIFT as part of their assisted reproductive treatment programme and these two procedures are explored briefly below.

#### 2.5.1 In Vitro Fertilisation-Embryo Transfer (IVF)

In 1978, reproductive history was made as the first baby from an IVF procedure was born. Ledger (2002) commented that IVF could be viewed both as a test of reproductive potential in its allowance of assessment of oocytes, oocyte-sperm interaction and embryo quality, as well as being an effective treatment for some forms of subfertility. IVF firstly involves the manipulation of the female hormonal levels to ensure a timeous ovulation of the egg cell (oocyte) by temporarily switching off the messages from the brain to the ovaries that tell the ovaries to release one oocyte per month. Injections that contain a cocktail of follicle stimulating hormones are then (self) administered daily for 1 to 2 weeks. Once the follicle has matured, a hormonal injection triggering the release of the oocyte is administered. Thirty-six hours after this injection, a needle, guided by ultrasound imaging, is inserted through the vaginal wall into the ovaries where the follicles are penetrated and the eggs withdrawn (Dooley, 2007; McShane, 1997; Tortora & Grabowski, 2003). These eggs are then taken to the laboratory where the oocytes are assessed. Sperm collected from the male partner is assessed, washed and prepared for insemination. Each egg is placed into a

dish to which a defined number of sperm cells are added. This dish is placed in an incubator and the fertilised embryos are monitored for a few days to ensure normal fertilisation has occurred (Ferring, 2002). An embryo would typically divide into 4 cells by approximately 48 hours and only an embryo that has undergone normal mitotic division is transferred back into the womb for implantation. Usually, 1-4 embryos are transferred by placement in a thin, plastic tube and inserted into the uterus through the cervix (Dooley, 2006; McShane, 1997). Multiple gestation is more likely to occur in younger women and a lesser number of viable embryos are usually transferred than for an older woman (McShane, 1997). Despite the technological advancement that now enhances the monitoring of follicle growth, oocyte collection and embryo development and the development of new drugs for superovulation, the majority of IVF cycles do not produce a viable pregnancy (Ledger, 2002).

### 2.5.2 Gamete Intrafallopian Transfer (GIFT)

In gamete intrafallopian transfer (GIFT), the goal is to mimic the normal process of conception by uniting sperm and the oocyte in the prospective mother's fallopian tubes. It is an attempt to bypass conditions in the female reproductive tract that might prevent normal fertilisation such as high pH levels or hostile cervical mucous (Tortora & Grabowski, 1996; 2003) As in IVF, the hormones are introduced into the woman's body to time ovulation and to hyperstimulate the follicles, and the oocytes are similarly retrieved. Sperm obtained from the male partner is washed and prepared in readiness for the procedure. The oocytes (usually two at a time) and sperm are now placed together in a catheter. A laparoscopy is performed on the woman and a small camera is placed under the navel in the pelvic area. A laparoscopy is a small surgical procedure in which a laparoscope is inserted through an incision in the abdominal wall (Tortora & Grabowski, 1996). The fallopian tube is held using special instruments, the catheter is inserted into the fallopian tube and the oocytes and sperm are injected into the fallopian tube (Ferring, 2002). Although this procedure allows for a more natural process of fertilisation, the fact that the oocyte and the sperm are in close proximity to each other does not guarantee that fertilisation will take place. The GIFT is dependant on there being at least one functional fallopian tube and a relatively normal semen analysis for success (McShane, 1997).

These technological advances, though awe-inspiring, cannot guarantee success and couples may find themselves sacrificing emotionally and financially in pursuit of

conception. Couples are challenged to revisit the manner in which they perceive the ideas of motherhood, fatherhood, and family even as technology challenges society's ethical standpoint on reproduction.(Leiblum, 1997a).

## **2.6 The Experience of Infertility Treatment**

Women who enter the ART programmes may have struggled with infertility for a considerable amount of time. In the United States, women experienced an average of 6,4 years of infertility prior to receiving medical treatment (Adler, Keyes & Robertson, 1991). The experience of infertility treatment has been found to be extremely stressful in both a physical and emotional sense for women (Berg & Wilson, 1990; Cwikel, Gidron & Sheiner, 2004; Doyal, 1995). Results from a survey conducted amongst women awaiting IVF treatment revealed that these women had four times the level of depressive symptoms than a control group of women without fertility problems. The women who participated in this study also had lower scores than their control group counterparts in terms of self-assessed attractiveness, anxiety, memory and concentration (Oddens, den Tonkelaar & Niewenhuyse, 1999). Domar et al. (1992) found that depression levels were twice as high as when compared with a control group of women. Women with a 2-3 year history of infertility had the highest level of depression in comparison to those who had experienced infertility for either less than one year or more than six years (Domar, et al., 1992). A possible explanation for this U-shaped pattern may be that women are initially buffered against depressive symptoms with hope and the prospect of pregnancy. However, the effect of prolonged fertility treatments and the monthly cycles of hope and disappointment ultimately lead to increased depressive symptoms amongst women who experience failure of treatment. It appears that women become accustomed to their status after six years and reach a level of acceptance that affords protection against depressive symptoms (Domar et al., 1992). Thiering et al. (1993) found that clinically elevated depression scores were most prevalent amongst women who were repeating IVF treatment and relatively prevalent in those women who proceeding with IVF for the first time. Litt et al. (1992) reported that a failed or unsuccessful cycle of IVF often led to a temporary state of depression and a sense of loss. Some participants in the IVF programmes report considerable stress, pain, anxiety, feelings of loss of control and depersonalisation (Doyal, 1995).

## **2.7 The Psychological Impact of Infertility**

Many reproductive events may be regarded as stressors. For example, the possibility of a miscarriage or of having a baby born with a physical defect may be considered as a threatening event. Other events, such as an unwanted baby, may be seen as a symbol of loss of freedom, or the birth may be perceived as a particularly stressful, painful and frightening event (Johnston, 1993). Infertility, with its psychologically and physically draining diagnostic and treatment procedures, is considered to be one of the most difficult stressors faced by a young couple (Cooper-Hillbert, 1998). Like many other life stressors, infertility cannot be isolated to a single moment in a person's life, but is usually experienced as a pervasive, unfolding process (Dunkel-Schetter & Lobel, 1991). These researchers observed that after a year without conception, many couples enter the medical arena to seek treatment and to begin to contend with the possibility that they may not be able to conceive. For most couples, it is the ambiguity and uncertainty related to infertility that becomes a significant stressor (Cooper-Hillbert, 1998; Leiblum & Greenfield, 1997). Infertility is, at first perceived as a threatening experience but as time passes without conception, the situation becomes one associated with loss (Dunkel-Schetter & Lobel, 1991; Leiblum, 1997a). The psychological effects of infertility can be considered under the following categories: (a) emotional effects, (b) loss of control, (c) effects on self-esteem, identity and beliefs, and (d) social effects. These categories will be explored in greater depth in the section to follow.

### **2.7.1 Emotional effects**

With each passing month without conception, the individual and couple system become more deeply aware of the reality of infertility and experience the unfolding sequence of hope and despair, promise and disappointment (Cooper-Hillbert, 1998). Five of the more common emotional responses and themes are grief and depression, anger, guilt, shock and denial and anxiety. Researchers have observed a pattern or sequence of stages typical to individuals and couples experiencing infertility. The so-called "roller coaster" from hope to despair typically involves the stages of surprise/shock, denial, anger, isolation, guilt, grief/depression, and acceptance or resolution (Boivin, 2002; Clapp, 1985; Cooper-Hillbert, 1998; Honea-Fleming, 1986; Menning, 1980).

Shock, denial and surprise are often noted as the first coping responses to the diagnosis of infertility (Cooper-Hillbert, 1998; Dunkel-Schetter & Lobel, 1991). The individuals in the couple system who may have taken the status of their fertility for granted are often devastated at the prospect of not being able to conceive a child (Leiblum & Greenfeld, 1997). Feelings of shock and disbelief may evolve into an experience of denial (Cooper-Hillbert, 1998), fostering the monthly hope and disappointment cycle common in infertile couples. As the couple's sense of disappointment gradually deepens with each month of non-conception and the denial experienced during the early stages of infertility, a feeling of helplessness may become overwhelming for the couple (Cooper-Hillbert, 1998). Men and women entering the technological arena of medical infertility treatment often experience anxiety and worry about the procedures, the possibility of success and the probability of failure (Dunkel-Schetter & Lobel, 1991). Couples may also have concerns about their body image, sexual performance and the effect of the situation on the marriage or relationship (Kraft, Palombo, Mitchell, Dean, Meyers, & Schmidt, 1980; Leiblum & Greenfeld, 1997). As the medical treatment, diagnostic procedures and schedules pervade their everyday lives, the couple may feel anxious about the extent of the cause of the infertility, may have questions about the strength of their relationship and fear the possibility of never being able to conceive (Cooper-Hillbert, 1998).

The anxiety then soon gives way to anger and resentment. Anger is a common emotional response to infertility (Cooper-Hillbert, 1998). The "healthy" partner may feel angry and resentful towards the partner identified with the cause of the infertility. Individuals may resent themselves for past behaviours and practices that may have some bearing on the present state of infertility and may regret using contraceptives, pursuing careers, or previous sexual relationships (Doyal, 1995). Anger may range from a sense of frustration to an embittered rage directed towards the self, spouse, family members, friends or members of the medical treatment team (Kraft et al., 1980). Reports about abortion or child abuse cases may incite the couple to anger (Doyal, 1995). Partners may overreact and become angry at invitations to weddings, baby showers, children's birthday parties and resentful towards those whom are pregnant (Cooper-Hillbert, 1998). Anxiety, grief and depression are the emotions most frequently experienced by women facing infertility (Daniluk, 1988; Dhawliwal, Gupta, Gopalan & Kulhara, 2004; Mahlstedt, 1985; Menning, 1980). Struggling with many questions and few answers, the couple facing infertility commonly experiences

a deep sense of loss. Research has provided evidence that the sense of loss associated with failed conception is similar to the mourning reaction after the death of a loved one (Abbey, Andrews & Halman, 1992; Kemeter & Fiegl, 1998). Research conducted by Sadler and Syrop (1987) found that the couple may experience a sense of loss similar to that of families of a soldier missing in action. These families have no clear explanation of what had happened, are uncertain as whether they should give up hope or remain hopeful and remain in an emotional limbo for an indeterminate time. As with infertility, there are no guarantees that there will be a definitive outcome or a rational answer that will bring resolution (Cooper-Hillbert, 1998). With each unsuccessful cycle, the couple begins to feel hopeless and depressed, lose faith in the reliability of fertility treatments, and feel robbed of excitement and meaning in life (Leiblum & Greenfeld, 1997). The levels of anxiety and depression observed among infertile women has also been found to be comparable to woman with cancer but less than levels observed among women with chronic pain syndromes or the Human Immunodeficiency Virus (HIV) (Domar, et al., 1993).

The depression experienced is often related to a combination of the sense of loss felt by the partners and the effect of long-term strain during the diagnosis and treatment process of infertility (Mahlstedt, 1985). Many adults experience losses throughout their lives that may precipitate depression, including loss of status, self-esteem, health, confidence and the loss of someone who is important to them (Sadler & Syrop, 1987). Infertility has been found to encompass all of these losses (Cooper-Hillbert, 1998) but because the loss is not tangible, the couple experiencing infertility are at risk for delayed or incomplete grief recovery. This sense of loss is more than the loss of the biological function to conceive and give birth but also encompasses the disruption of future plans and the shattering of hopes and dreams related to having a family. Exacerbating this factor is the tendency of the couple to idealise their child and family life as being more perfect and idyllic than is realistically possible (Sadler & Syrop, 1987). Partners may perceive their infertility as a personal failure and believe themselves to be inadequate, defective or deviant (Dunkel-Schetter & Lobel; 1991; Leiblum & Greenfeld, 1997). Fear of being stigmatised by their social circle and reluctance to share about as private a part of their lives as their sexual functioning, tends to isolate the couple in their grief (Leiblum, 1997a). As a result, sadness and monthly disappointments pass by without support or acknowledgement from those in society. Society makes no provision for the public display of mourning



infertility through some form of socially acceptable ritual or practice. Ultimately, their grief and heartache is unknown and misunderstood and often, difficult to resolve (Cooper-Hillbert, 1998).

Guilt is a common emotion experienced by those faced with infertility (Dooley, 2006; Leiblum & Greefeld, 1997). One or both partners may feel a sense of responsibility and guilt at not being able to grant the opportunity to fulfil the parental role. Pressure from family members and perceived societal expectations often leads to the couple feeling as if they have let down those who are important to them or that they have not fulfilled a vital role in society (Cooper-Hillbert, 1998). Guilt, self-hatred and feelings of personal responsibility are also frequently experienced by women diagnosed with infertility (Boivin, 2002; Domar, Seibel & Benson 1990). The feelings of guilt may be related to regret about previous sexual practices, the use of contraceptives and delaying trying to conceive because of career opportunities or personal choices (Rosenfeld & Mitchell, 1979; West, 1983). Individuals may experience feelings of guilt and regret because of the belief that the infertility is a punishment for an incorrect life choice (Kraft et al., 1980).

Gradually, some couples begin to move to resolution as they learn how to cope with or tolerate the stress they have been experiencing. The stage of resolution may not always be a 'positive' outcome for the existing couple system. (Boivin, Scanlan & Walker, 1999; Leiblum & Greenfeld, 1997). In some instances resolution may mean that the couple divorce, remarry other people and have a family. In other couple systems, partners may choose not to express their experience of infertility and try to carry on with their lives as if nothing had happened. Effective resolution involves the confrontation of the loss of being biological parents and the re-evaluation of goals and hopes for their marriage or relationship (Cooper-Hillbert, 1998; Dunkel-Schetter & Lobel, 1991).

This section explored the range of the emotional impact of infertility. The next section discusses the sense of loss of control experienced by individuals diagnosed with infertility.

### 2.7.2. Loss of Control

Infertility is almost always met with surprise and shock as couples who had taken care to prevent unplanned pregnancies earlier in life are confronted with the possibility of not being able to conceive (Leiblum & Greenfeld, 1997). Career

orientated women who had planned to wait for the 'right' time find themselves grappling with the concept that they may be running out of time to conceive (Metzger, 1998). Coupled with this pressure of time, infertile women tend to express a sense of loss of control over their lives (Dunkel-Schetter & Lobel, 1991). This loss of control experienced by women and couples with infertility are often related to the medical procedures and treatments that begin to infiltrate their personal lives (Berg & Wilson, 1991; Cooper-Hillbert, 1998). Daily schedules and short-term plans become peripheral to the central focus of monitoring the body for ovulation and optimum fertilisation (Dooley, 2006). Each failed attempt at conception adds to the feelings of helplessness and powerlessness, which may be exacerbated by friends and families' well intended advice (Leiblum & Greenfeld, 1997). After a prolonged period of infertility treatment and repeated failed attempts at conception, these feelings of helplessness and loss of control could lead to depression and despair (Dunkel-Schetter & Lobel, 1991).

This section briefly explored feelings of loss of control associated with infertility and infertility treatment, the following sections look at effects on self-esteem, identity and beliefs, as well as its social effects.

### 2.7.3 The Effect of Infertility on Self-esteem, Identity and Beliefs

Modern society, despite many social changes, still perceives motherhood as a natural role for women (Kruger, 2006). Women, operating within a context of cultural and societal expectations, consider it important to be seen as healthy, normal and capable of reproduction and feel the need to be reassured that they are not damaged or defective (Leiblum & Greenfeld, 1997). Research has provided evidence that feelings of low self worth and self-esteem are not limited to reproductive function but pervades into other personal spheres such as sexual function and desirability, physical attractiveness, performance and productivity (Dunkel-Schetter, 1991). Women diagnosed with infertility report changes in their self-concept and some women may even perceive their bodies to be ugly, defective or deformed after a diagnosis of infertility (Cooper-Hillbert, 1998; Dunkel-Schetter & Lobel, 1991).

In terms of beliefs, women undergoing infertility treatment may find themselves facing moral and ethical dilemmas in terms of questions surrounding sperm donation, surrogacy and artificial reproduction (Leiblum & Greenfeld, 1997). These researchers

also noted that women may experience a religious crisis of faith or struggle to incorporate their own infertility into their personal spirituality or philosophy.

#### 2.7.4 Social Effects of Infertility

The diagnosis of infertility can be particularly stressful on a couple's relationship. Anger, guilt, feelings of resentment and the feeling of being misunderstood have been reported as having a detrimental effect on a relationship (Dunkel-Schetter & Lobel, 1991). While many studies have shown that women in infertile couples reported less marital adjustment and poor quality of life (Monga, Alexandrescu, Katz, Stein & Ganiats, 2004), other studies have reported that infertility had served to strengthen the bonds between partners (Cooper-Hillbert, 1998; Dunkel-Schetter & Lobel, 1991; Leiblum & Greenfeld, 1997).

Studies showed that women diagnosed with infertility feel isolated and socially unworthy (Domar, Seibel & Benson, 1990) or pressured by society and familial expectations (Dooley, 2006). Social gatherings involving children may prove to be a particularly painful experience for the woman diagnosed with infertility and may incur feelings of envy, jealousy and resentment (Metzger, 1998).

Section 2.7 explored the psychological effects of infertility. The next section will consider gender and infertility.

### **2.8 Infertility and Gender**

Infertility affects both members of the couple system, but research suggests that it is usually the woman who experiences the greatest distress and is most affected by the inability to conceive a child (Wright, Allard, Lecours & Sebourin, 1991). Leiblum (1997b) observed that when the diagnosis of infertility is either unspecified or due to female factors, women display more stress, anxiety and depression over the inability to conceive than men (Lee et al., 2000). Women are more likely to present with problems of infertility than are their partners or husbands (Johnston, 1993) and studies have suggested that their seeking of treatment is a positive decision to achieve reproduction (Adler et al., 1991). In a study conducted by Anderson, Sharpe, Rattray and Irvine (2003), women were found to report more significant infertility related concerns regarding life. The following section discusses the experience of infertility in relation to stress.

## **2.9 Infertility and Stress**

The first major source of stress facing the infertile couple is related to trying to conceive and being disappointed on a monthly basis. Women feel that life revolves around her menstrual cycle, there may be tension in the marriage system and normal romantic relations have become mechanised and regimented to an ovulation chart (Dooley, 2006). The mere experience of undergoing infertility treatment is also considered to be a stressful experience (Leiblum, 1997a). Incessant questions and joking from well-intentioned family members also becomes stressful. Stress has been shown to have an effect on infertility. The experience of stress stimulates the adrenal glands to secrete cortisol. Over a prolonged period of stress, the amount of cortisol in the body becomes excessive and can ultimately upset the hormonal balance in the system. In women, the hormone prolactin may be overproduced and interfere with normal ovulation and could cause menstruation to become irregular. In men, an increase in stress levels has been linked to a drop in sperm count and an increase in sperm abnormalities (Sheiner et al., 2003). The following section briefly explores infertility and the psychofortigenic construct of coping.

## **2.10 Infertility and Coping**

The individual or couple's decision to enter into the arena of infertility treatment is largely dependant on the quality of information and likely success of procedures (Johnston, 1993). The decision is also dependant on the value placed on having a baby. For instance, a woman who highly values having a baby will undergo the treatment despite the possibility of low success (Johnston, 1993). Some women may overestimate the success rate of a procedure such as IVF and be overly optimistic (Johnston, Shaw & Bird, 1987). This overestimation of success and optimism may be part of a coping process that makes the stress of undergoing IVF more tolerable (Johnston, 1993).

Women may differ in their predominant coping styles, in their levels of perceived control over events and in their perceived social support (Johnston, 1993). Strategies most commonly used by women to cope with infertility include seeking social support, escape-avoidance, problem-solving, and positive reappraisals (Lee, Sun, Chao & Chen, 2000). The differences between avoidant and attentional coping styles have been investigated with regards to the manner in which women cope with the stress of infertility. A person using the avoidant coping style tends to direct their

attention away from the threat, whereas the person with a predominantly attentional style directs their attention towards the threat (Dunkel-Schetter & Lobel, 1991). Suls and Fletcher (1985) provided evidence that an avoidant coping style is more beneficial when dealing with short-term stressors such as the IVF procedure, while the attentional style of coping is more useful for enduring long-term stressors such as infertility. Perceived control is considered important in terms of coping and subjective well-being (Compton, 2005). While a strong sense of internal control has been associated with less distress, it may prove beneficial to the woman undergoing a complex medical procedure to place control in the ability of health professionals. Social support has also been shown to be an important predictor in subjective well-being (Compton, 2005; Diener, et al., 1999; Myers, 2000) and is an important variable influencing the manner in which the woman undergoing infertility treatment copes with the associated stress (Johnston, 1993). The section that follows explores infertility and subjective well-being.

### **2.11 Infertility and Well-being**

While infertility has profound effects on both men and women, research suggests that the woman tends to experience the greatest distress and is the one most troubled by the failure to conceive (Doyal, 1995). Despite the various social changes affecting women and the changing nature of the roles of women in modern society, the status of a woman as mother remains, in many cultures, to be a core element in the definition of a normal adult female. This perception cultivated by society then becomes internalised by the woman and under these circumstances, the inability to conceive or become a biological parent becomes an immense pressure that affects the woman's sense of identity and well-being (Helman, 2001; Doyal, 1995). Daniluk (1997) found that infertility is linked to a dramatic change in the woman's sense of a social self. Women who have been diagnosed with infertility often feel a sense of isolation and alienation from other women and members of the family. Few studies have focussed on the effect of treatment on the psychological well-being of women undergoing infertility treatment (Berg, 1994; Edelmann & Connolly, 2000). This study aimed to explore and describe the coping and subjective well-being of women undergoing infertility treatment. The following section considers the long-term effects of infertility.

### **2.12 Long- Term Effects of Infertility**

The emotions experienced by the couple during the diagnosis and treatment of the infertility may not disappear immediately with conception, birth or another form of resolution. In their longitudinal three year study, Berg and Wilson (1991) found that most couples perceived their marital adjustment and sexual relationship as being adequate during their first year of infertility treatment but that partners had begun to experience the acute effects of stress associated with the early stage of treatment. In the second year, partners were managing stress adequately and maintained levels of healthy psychological functioning. The third year proved to be the most difficult year for couples during which couples reported increased psychological strain, depression, marital strain, and increased levels of hostility, anxiety, obsessive-compulsive behaviours. Regardless of the manner of resolution, the grief and anxiety related to childlessness does not disappear easily.

The following section discusses the impact of conception after infertility treatment.

### **2.13 Pregnancy after Infertility Treatment**

Patients' infertility history has an impact on the way they live through pregnancy and child-rearing. Infertility creates a crisis at the individual, relational and social levels. The transition from infertile patient to pregnant patient may be influenced by the individual fertility history of each patient, the way they have dealt with their infertility problem in the past, their sociocultural environment and the kind of treatment they have had (Baetens, 2002). Infertile patients have had to go through tremendous efforts in order to have a child (Dooley, 2006). The pregnancy represents an enormous investment of time, emotions, energy and often money. During the treatment patients focus on becoming pregnant and when pregnant, they have to deal with the possibility of complications and the risk of losing the pregnancy (Cooper-Hillbert, 1998, Leiblum & Greenfeld, 1997). This is especially problematic if they already have experience with reproductive loss. Clinical experience shows that anxiety and stress are increased during the pregnancy after infertility treatment. (Baetens, 2002).

Two extreme reactions in relation to the pregnancy might appear in some patients. Denial might occur in women who are not capable of developing an attachment to the foetus because of the anticipation or fear of negative events during pregnancy (e.g. miscarriage). Others may develop an exaggerated worry about each 'normal' physical

event in the pregnancy (Covington, 1987). The fact that pregnant patients do not feel extremely happy about their pregnancy, as they feel they should, produces feelings of guilt and shame, which further reinforce feelings that they may have developed when the infertility problem was first discovered (Domar, 1995; Dooley, 2006).

Being pregnant introduces issues concerning the welfare and especially the health of the baby to be born. The patients' inability to conceive may have already produced a lack of confidence in their bodies and therefore might decrease the belief in their bodies' competence during pregnancy and delivery. Higher anxiety levels during the pregnancy are related to the IVF mother's concern for the well-being of the baby and her fear of being separated from her baby after the birthing process (McMahon, Ungerer, Beaurepaire, Tennant & Saunders, 1997).

Moreover, infertility patients have to deal with a lot of uncertainty about the quality of their future parent-child relationship and child-rearing practices (Leiblum, 1997b). Becoming a parent has lost all its naturalness. Parents often have the feeling that they have to prove that they will be worthy parents. Sometimes they even feel that they are not competent to be parents. Most couples overestimate their chances before treatment and face extreme disappointment when treatment fails (Johnston, 1993; Johnston, Shaw & Bird, 1987). The woman may go through the characteristic emotions and stages of grief: shock, denial, anger, rage, isolation, feelings of guilt, depression and lastly adaptation and acceptance (Hirsch & Hirsch, 1989).

#### **2.1.4 Conclusion**

With the increase of the incidence of infertility rates and the rapid development in reproductive technology, more research is needed to understand the unique experiences of women in the midst of physiology and technology. This chapter aimed to balance the medical and psychological perspectives of infertility by examining the medical causes and psychological effects of infertility. The following chapter will explore the paradigms of positive psychology and psychofortology, which forms the theoretical context for this study.

## Chapter 3

### Positive Psychology and Psychofortology

#### 3.0 Introduction

The present study is focussed on exploring and describing the coping (i.e., the coping resources and the sense of coherence) and the subjective well-being (i.e., concepts of satisfaction with life and happiness) of women currently undergoing infertility treatment at a privately managed health care unit. Together these sub-constructs, for the purposes of this particular study, constitute the construct of psychofortology. This study has a fortigenic orientation, as it places particular emphasis on the inherent psychological strengths and resources of the participants. This chapter provides a contrasting description of the traditional pathogenic paradigm and the positive psychology movement, and also includes a focus on the salutogenic and fortigenic orientations that provide the theoretical milieu from which the above-mentioned concepts have arisen.

#### 3.1 Defining Positive Psychology

The positive psychology movement, founded partially by Martin Seligman (1998), was born out of a realisation that “psychology is not just the study of pathology, weakness, and damage;” but also the scientific study of “strength and virtue”(Seligman & Csikszentmihalyi, 2000, p.7; Sheldon & King, 2001). In general terms, positive psychology uses psychological theory, research, and intervention techniques to understand the positive, the adaptive, the creative, and the emotionally fulfilling elements of human behaviour (Compton, 2005).

Positive psychology, according to Seligman and Csikszentmihalyi (2000) focuses predominantly on three areas of the human experience that provides guidelines for the paradigm.

1. At a subjective level, positive psychology looks at positive subjective states such as happiness, joy, satisfaction with life, relaxation, love, intimacy and contentment.
2. At the level of the individual, it places emphasis on studying positive individual traits and more enduring behavioural patterns developed over a span of time such as courage, honesty, persistence and wisdom.
3. At the level of groups and society, it focuses on the development, creation and maintenance of positive institutions such as healthy families and positive communities



and work environments. These qualities include responsibility, nurturance, altruism, civility, moderation, tolerance and a diligent work ethic.

In summary, positive psychology seeks to explore and foster the factors that allow individuals, families, communities, and societies to flourish (Fredrickson, 2001; Seligman & Csikszentmihalyi, 2000).

A key question of the paradigm, as noted by Sheldon and King (2001) begs answer, "...how can psychologists explain the fact that, despite all difficulties, the majority of people live with dignity and purpose?" (p.216). Positive psychology encourages the consideration of the ordinary person and a closer examination of the manner in which the ordinary person employs learned skills to maintain and optimise an already efficient lifestyle (Sheldon & King, 2001).

A major theme of the paradigm is finding answers to the question of "What is the good life?" (Compton, 2005). It is a question that has been the focus of attention of the earliest thinkers (Diener, 2000; Strack, Argyle & Schwarz, 1991). While many people equate "the good life" with extreme wealth, power, prestige and beauty, the idea stems from philosophical speculations about what holds the greatest value in life or what is the nature of the highest and most important "good" (Compton, 2005). Within the positive psychology paradigm, the good life is considered to be a combination of three elements: (a) positive connections to others, (b) positive individual traits, and (c) life regulative qualities (Compton, 2005). Building positive connections to others includes the ability to love, the presence of altruistic concerns, the ability to forgive, and the presence of spiritual connections to foster a sense of deeper meaning and purpose in life. Positive individual traits include a sense of integrity, the ability to play and be creative, and the presence of virtues such as courage and humility. Life regulation qualities are those that promote the regulation of day-to-day behaviour in a way that allows for the realisation of goals while helping to enrich the people and institutions encountered along the path to these goals (Compton, 2005). These qualities include a sense of individuality and autonomy, a degree of self-control, and the presence of wisdom as a guide to behaviour (Compton, 2005). Qualities also thought to help define the good life are those that enrich our lives, make life worth living and those that serve to foster strong character (Compton, 2005). Seligman (2002) suggested that the good life is concerned with "using your signature strengths everyday to produce authentic happiness and abundant gratification" (p.13). These human strengths act as buffers against mental illness and

includes, amongst others, positive individual traits such as courage, future mindedness, optimism, faith, work ethic, hope, honesty and interpersonal skills. Individuals are empowered by these traits and qualities and allow the enhancement of coping resources that in turn allows for greater resilience and hardiness (Kobasa, 1979).

Seligman and Csikszentmihalyi (2000) further expanded the understanding and boundaries of psychology by stating that it is more than a branch of medicine that is focussed on illness or health but is concerned with “work, education, insight, love, growth and play” (p.7). Meichenbaum (1994) noted in his work with traumatised individuals, how, despite the trauma experienced or the pain they have endured, people survived the experience and supposed that there existed within each individual an inner strength, a remarkable endurance and some degree of resiliency. It is these qualities, as argued by Abi-Hashem (2001), that can too easily be overlooked and overshadowed by agony, despair and defeat. Furthermore, research indicates that the majority of the human population achieve a state of thriving and perceive themselves to be happy and satisfied with their lives (Meyers, 2000). Seligman and Csikszentmihalyi (2000) have remarked on a gradual shift from the dominant view of viewing individuals as passive, helpless victims who respond merely to drives and stimuli to a view which provides a space for individuals to be “decision makers with choices, preferences and the possibility of becoming masterful, [and] efficacious” (p.8). These researchers have also urged that this new field of psychology be a science of human strengths and virtues that can be inculcated in young people and future generations. Accordingly, a major development in this field has been the development of the Character Strengths and Values (CSV), a classification of strengths that aims to provide insight into human strengths as opposed to deficit and pathology (Linley & Harrington, 2005). Positive psychology, as succinctly stated by Linley and Joseph (2004), is the scientific attempt to promote optimal functioning across the spectrum of human ability, moving away from a perspective of distress and disorder to one of health and fulfillment. The movement to positive psychology was a reaction to the inadequacy of the pathogenic paradigm to provide explanations and theory to encompass the full range of human potential. The following section considers the historical context of positive psychology by exploring the pathogenic, salutogenic and fortigenic paradigms.

### 3.2 The Pathogenic Paradigm

The 20<sup>th</sup> century heralded an era in which the causality of illness was thought to have been isolated in a specific disease-causing organism or pathogen. This understanding, based on the biomedical model of health, resulted in technological advances in the field of medicine and a proliferation in the development of synthetic drugs and treatments- all of which engendered an optimism that many diseases and infections could be cured (Brannon & Feist, 1997; Sarafino, 2002). Traditionally the dominant view in medicine, the biomedical model defines health exclusively in terms of the absence of health and, as such, is more disease focussed (Brannon & Feist, 1997). The model is based on a number of assumptions. The first being mind-body dualism or the idea that the mind and body can be treated separately (Nettleton & Gustafsson, 2002). A second assumption is that the body can be repaired in a similar way to that of a machine. This mechanical metaphor implies that doctors and medical practitioners act as engineers who are able to fix and repair the broken down or dysfunctional body (Nettleton & Gustafsson, 2002). Medical and health problems are then resolved via the technological imperative (i.e., technologies such as drugs or invasive machinery penetrate the anatomical structure in order to restore and repair the damage). The concept of homeostasis as introduced by Canon (1939) embodies the mechanistic view of health and is considered to be a central concept in the pathogenic paradigm and the biomedical model. It supposes that the normal, functional state of the human organism is relatively stable and constant. This constant state is maintained by various complex, systemic regulatory mechanisms and is disrupted by pathogens and stressors. The failure of the regulatory mechanisms to adapt and restore the homeostatic balance results in disease and pathology.

Medical knowledge is presumed to be an objective science, based on rational empirical evidence and presumed to be neutral in its explorations and findings. Of primary focus is the hunt for a specific identifiable agent, whether parasite, virus, bacterium or gene as a potential cause of disease, contributes to the reductionism of the paradigm (Nettleton & Gustafsson, 2002). The pathogenic model has promoted a focus by researchers, practitioners and policy-makers to identify the specific disease being caused, the identification of high-risk individuals and groups, and the prevention of disease (Antonovsky, 1987, 1996; Barnard, 1994; Strümpfer, 1993; 2001; Witmer & Sweeney, 1992).

According to Seligman and Csikszentmihalyi (2000), the field of psychology's purpose before the Second World War was to cure mental illness, to make the lives of all people more productive and fulfilling, and to identify and nurture high talent. After World War II, however, the field of psychology aligned itself very strongly with the science of healing, and by implication, the science of repairing that which is damaged or diseased (Seligman & Csikszentmihalyi, 2000). As in the field of medicine, psychology's engagement with the biomedical model resulted in considerable advancement in the understanding and treatment of mental illness (Seligman & Csikszentmihalyi, 2000). This orientation, however, led to "an obsessive proclivity for 'deficit detecting' " (Barnard, 1994, p.136) as the focus of psychology shifted to assessing and curing suffering (Seligman & Csikszentmihalyi, 2000). Influenced by a Western culture "obsessed with, and fascinated by, psychopathology, victimology, abnormality, and moral and interpersonal aberrations" (Saleebey, 1997, p.4), practitioners treated the mental illness of patients within the framework of disease and dysfunction. This emphasis on the pathological, objectified and defined the human being as a passive, helpless creature at the mercy of the various internal drives and external stimuli (Seligman & Csikszentmihalyi, 2000). Sheldon and King (2001) argued that the predominant negative bias prevalent in traditional psychology has resulted in a considerable gap in the theoretical understanding of health.

This paradigm's reductionistic explanation, of and solutions to, disease found almost exclusively within a biological and physical context is limited as it neglects the possibility and potential of influence of psychological and social factors (Nettleton and Gustafsson, 2002). It could be argued that the biomedical model is itself a sociological construct, a model created in order to privilege a particular view of health in relation to illness (Kelly & Field, 1994). The extent to which our bodies are influenced by ideas remains debatable. While some social scientists draw on the work of Foucault (1976) and suggest that ideas about disease and the body are constructions of discourse and effects of practices, activities and communities of language (Arney & Bergen, 1984; Bunton & Petersen, 1997), others maintain that knowledge of the body, of illness and health are related to the social relations through, and in which knowledge is created (Annandale, 1998). The latter argument is particularly pertinent if one considers the power relation existing between medical knowledge and women's bodies and the manner in which certain patriarchal discursive relations are reinforced

and perpetuated through a disease and medical framework (Martin, 1989; Stacey, 1988).

Towards the late 1970's it had become increasingly clear that the problem-orientated biomedical model could not satisfactorily account for normal functioning or optimal functioning of the ordinary person (Sheldon & King, 2001; Strümpfer, 1993). The pathological focus had become problematic as it had excluded and discounted the possibility that a human being could maintain a sense of integrity despite severe suffering and possess various qualities such as courage, future mindedness, optimism and faith that act as a protective barrier against mental illness (Seligman & Csikszentmihalyi, 2000). Abi-Hashem (2001) commented that some theorists and therapists had had a tendency to be preoccupied with what was wrong, damaged, broken, and pathological to the extent that the discovery of what was healthy, the strengthening of what existing qualities and traits, the fortification of what existed before and beyond the pathology and the exploration of ways in which to instil meaning and realistic hope were not deemed as important. While research has led to a greater understanding of how people survive in conditions of adversity (Benjamin, 1992; Koch & Leary, 1985; Smith, 1997), the exclusive focus on pathology has resulted in psychologists having very little knowledge of what makes life worth living or about how people flourish under benign and ordinary conditions (Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001).

Seligman and Csikszentmihalyi (2000) suggested that the main aim of positive psychology is to “begin to catalyse a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building positive qualities” (p.5). It is an attempt to encourage psychologists and researchers to adopt a more open and appreciative perspective regarding human potential, motives and capacities (Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001). Abi-Hashem (2001) called on social scientists to focus more on what is good, right, normal, well and healthy rather than allow the abnormal psychology and psychopathology to guide and inform psychological practice. The orientation rethinks the idea of treatment as being more than “fixing what is broken” but also as a process of “nurturing what is best” (Seligman & Csikszentmihalyi, 2000, p.7). The awareness of a need for psychology to look beyond the confines of pathology and deficit prompted a change during the 1980's as a “new” paradigm- one focussed on making “appreciative assumptions and attributions about health, motivation and capacities,

potential and social functioning”- began emerging (Strümpfer, 2005, p.4). The following section of this chapter will explore the significance of the movement towards a psychology of health and the history of related concepts.

### **3.3 Health Psychology**

The term “health”, until a few decades ago, was hardly mentioned in medical forums and the term did not even appear in the index of many standard medical texts (Caplan, Engelhardt & McCartney, 1981). Health was traditionally viewed as a state in relation to, and not separate from, illness (Sarafino, 1990). George Stone (1987) wrote that definitions concerning health fall into two primary categories. The first category holds that health is an ideal state and the second implies that health is a movement in a positive direction. The first definition suggests that any disease or injury is a deviation from good health and that the ideal state of health can be restored by removing the disease and disability (Brannon & Feist, 1997). The second definition considers health as a direction on a continuum and implies that movement toward greater health is better than movement in the opposite direction (Brannon & Feist, 1997). This distinction and continuing debate regarding the conceptualisation of health became increasingly apparent as professionals and theorists began to regard health as a dynamic process that is somehow more than merely the absence of disease. The World Health Organisation, in 1947, defined health as physical, mental, and social well-being, not merely the absence of disease and infirmity (World Health Organization, 1948). In recent years, the concept of “spiritual well-being” was added to the definition (Brannon & Feist, 1997). The following section will explore the emergence of salutogenic orientation, related concepts and the growing importance of its place in scientific research and everyday life.

### **3.4 The Salutogenic Orientation**

Strümpfer (1993), in acknowledging the influence of ancient sages and modern theorists in the development of the paradigm of positive psychology, noted that what today seems like a “new paradigm” is an old one that is just becoming evident in Western Psychology. The paradigm has formed as a result of a “Zeitgeist”, a climate of opinion or habits of thought that help define and characterize the culture of the period and that encourages the development of concepts and particular discoveries (Strümpfer, 1990; 1993). Largely overshadowed by the pathogenic paradigm, an

alternative focus on health, strengths and positive characteristics of the human existence has been severely marginalised. The result has been a relative obscurity of relevant insights and discoveries in the field of health psychology (Sheldon & King, 2001).

According to Strümpfer (1993) Antonovsky is the clearest proponent of the salutogenic orientation. The word “salutogenesis” is derived from the Latin word “salus” meaning “health” and the Greek word “genesis” meaning “origin”. Antonovsky (1979; 1987) introduced the construct of salutogenesis as an alternative orientation intended to facilitate a greater understanding of health rather than illness. Antonovsky (1979) pondered the ubiquity of pathogens; whether microbiological, chemical, physical, psychological, social or cultural; and asked the question as to why, despite the regular onslaught of a pathogenic environment, everyone does not fall prey and become ill. Antonovsky (1979; 1987) argued that the mystery of health is not only concerned with the pathogenic origin of disease but is crucially related to the question of “Why do people stay healthy?” Antonovsky (1993) noted that the pathogenic paradigm limits the understanding of health in six ways. Firstly, the pathogenic paradigm encourages a dichotomous view of people as either healthy or diseased. Secondly, it promotes a focus of a specific pathogenic entity and investigation of specific immunities and cures. The idea that stressors are endemic to human living is incompatible with the paradigm and thirdly, limits explorations of generalised capacities for coping with the pathogenic stressors. The fourth limitation is that stressors are assumed to be negative or bad. Drawing on the work of Dubos (1960) to illustrate the fifth limitation, Antonovsky (1993) commented that the idea of a specific cure for a specific pathogen, a so-called “magic bullet”, contributes to an idea that modern medicine moves ever closer to utopia of a cure for every ailment (p.203). Finally, pathogenesis places high priority on the “high-risk group” and places less emphasis on possible “deviant cases” (Antonovsky, 1993, p.203) that exhibit signs and symptoms of wellness. These deviant cases are those individuals who successfully overcome the difficulties that are posed to them in life (Antonovsky, 1984). In relation to the present study, the question could be posed: “What enables women who are undergoing infertility treatment and experiencing all the accompanying stressors, to cope and find a sense of subjective well-being?”

Antonovsky (1993) showed the value of thinking salutogenically by highlighting the following six values. Firstly, rather than viewing people and their health as a

binary, salutogenesis provides the possibility of viewing health on a continuum. Antonovsky (1979; 1993) described this continuum as the “health ease-dis-ease” upon which any individual may find himself or herself placed at any one time. This implies that people are all somewhere between two imaginary poles of total wellness and total illness. The salutogenic paradigm therefore pays close attention to and explores the reasons why people are located towards the positive end of the continuum and what promotes the movement from illness to wellness. (Antonovsky, 1979; 1984; 1987).

Secondly, salutogenic thinking allows for the exploration of generalised factors involved in movement along the continuum rather than factors specifically related to a specific pathogen. A third value is related to the assumption that stressors are ubiquitous and part of daily living. Therefore, research and practice steer away from finding the “cure” for the pathogen and focus on discovering the resources available to cope with a wide variety of stressors and pathogens. Antonovsky (1993) commented that the study of health should look beyond the stressor and concentrate on what can be learnt from the experience of the stressor in order to live and live well, ultimately turning the existence of the stressor into an advantage.

Fourthly, Antonovsky (1993) wrote that salutogenesis avoids “hysteria” about stressors (p.204). Fifth, salutogenesis focuses more on the overall problem of adaptation and sources that facilitate avoidance of negative entropy. The paradigm, rather than placing health in the hands of the medical profession, opens the possibility of multidisciplinary research and cooperation. Sixthly, salutogenesis continuously seeks out the ‘deviant’ case or those who, despite the risk and odds posed by human existence, manage to live well. Salutogenesis puts forward the argument that researchers should study the survivors of adversity or illness rather than those who succumbed to disease (Kickbusch, 1996).

Following Antonovsky’s (1979) conclusion that stressors are omnipresent in human existence and that the human condition is inherently stressful, it became a question of how individuals managed this stress. It later became clear that individuals gained strength from their resources to cope with these continuous challenges and led to what was later termed generalised resistance resources (GRRs) (Antonovsky, 1996). The concept of GRRs is discussed in greater detail in Chapter 4.



### **3.4.1 The Sense of Coherence**

Antonovsky (1979) developed the construct of the sense of coherence to provide an explanation as to why people stay well despite the propensity of high stressor loads. The sense of coherence, by influencing the quality of the individual's cognitive and emotional appraisal of the stressor, acts as a buffer that ameliorates the harmful effect of the stressor (Antonovsky, 1979). If the individual has a strong sense of coherence, stimuli and stressors from the environment may be perceived as being comprehensible, manageable and meaningful or relevant to the individual's situation (Antonovsky, 1993). The sense of coherence will be discussed in greater detail in Chapter 4.

### **3.4.2 The Fortigenic Orientation**

Strümpfer (1995) argued that Antonovsky was struggling with a far more encompassing problem than merely salutogenesis. He posited that the concept be broadened to, and conceptualised as, 'fortigenesis' an orientation to the origins of psychological strength. The term is derived from the Latin word "fortis" meaning 'strong' and the Greek word, "genesis" meaning 'origin' (Strümpfer, 1995, p.82). Using Antonovsky's own writings, Strümpfer (1995) posited that the attempt to unravel the mystery of health was also an exploration of the origins of strength. He claimed that the findings of his research went beyond the conceptualisation of health and also covered the strength to deal with general concerns such as finances, growing old, security conditions in the country, and satisfaction with family roles (Strümpfer, 1995). Strümpfer (1995; 1993) has commented that, on the basis of Antonovsky's work and with reference to other constructs expressing aspects of health, strengths or wellness, a new orientation appears emergent. This correlates with a growing awareness of the need for a more urgent focus in psychology and related fields to resilience, strengths, resources and capacities of people (e.g., Barnard, 1994; Basic Behavioral Science Task Force, 1996).

Wissing and Van Eeden (1997) further suggested a new sub-discipline of psychofortology, with the aim of studying the nature and manifestations of psychological well-being and to develop human capacities. Pretorius (1997) further added to the value of this orientation by introducing the construct of fortitude as an indication of "the strength to manage stress and stay well" (p.174). This strength is derived from a self-appraisal, appraisals from the family, and as obtained from

support from others (Pretorius, 1997). It is believed that a greater understanding of why and how some individuals find the strength to endure and overcome pressures and why others do not, is more likely to lead to ways of increasing the numbers of those who do (Strümpfer, 1995).

The English words, fortify and fortitude, bear the meanings of imparted physical strength, vigour, endurance, to strengthen mentally or morally and suggest strength and courage in adversity or pain (Strümpfer, 1995). Fortigenesis reflects a particular philosophy of life and an orientation that is particularly pertinent to the South African context. It is interesting to note that in Sub-Saharan Africa, wellness or good health is equated with strength, and while good health is believed largely to be inherited, it is maintained by health promoting behaviours such as eating well, avoiding exposure to the harsh environmental elements and managing grief (Doyle, Hanks & MacDonald, 2001). Considering the daily hardships and conditions of living faced by the vast majority of South Africans, one is faced with a question of what enables people to cope and endure daily struggles and function efficiently. Strümpfer (1995) argued that it is a philosophy of strength or fortitude that provides people with what is needed to deal with conditions ranging from the daily stressors to the moments of extreme adversity.

### **3.5 Positive Psychology and Related Concepts**

While the development of theories about health, positive psychological and social functioning is a relatively new endeavour (Strümpfer, 2001), it is important to note that the fundamental theoretical underpinnings of the paradigm span a time frame that can be traced back to ancient texts (Strümpfer, 2005). Similarly, Walsh (2001), referring to non-Western psychologies, commented that “researchers of positive psychology have a practical and theoretical goldmine of more than 2,000 years of exploration of positive psychology on which to draw” (p.7). Three basic assumptions stem from the emerging paradigm of positive psychology. The first assumption, although not unique to the paradigm, is of central importance: that stressors, adversity and other inordinate demands are inherent to the human condition. The second assumption is that, despite these stressors and adversity, there are also strengths through which this condition can be endured and even transcended. Saleebey (1997) termed this the “strengths perspective”. The third assumption notes that physical,

emotional and social trials and tribulations can, for many, be beneficial in terms of stimulating continuous growth and strengthening virtues (Strümpfer, 2001).

Strümpfer (1993) found strains of salutogenic thought and related ideas in various works of psychological theory. The development and refinement of these ideas provided the theoretical milieu in which the paradigm of positive psychology was cultivated. At the heart of these ideas was an exploration and examination of the potential inherent in human beings and their capabilities despite hardship and adversity. These ideas and some related fortological constructs, which have been added to the growing body of research in positive psychology, are tabulated below.

Table 2

Positive Psychology and Related Concepts

<b>Concept</b>	<b>Researcher</b>	<b>Definition</b>
Hygiology	Super (1955)	As opposed to psychopathology, hygiology was concerned with counselling and exploring the normalities of even abnormal persons
Actualising tendency and the fully functioning personality	Rogers (1951)	Rogers' proposed that the organism has a "basic tendency...to actualize, maintain, and enhance the experiencing organism" (1959, p. 487). Well-being occurs proportionate to the extent that individuals can freely express their inherent potential.
Effective Drive	White (1959)	Effective interaction with the environment led to the attainment of competence and was accompanied by a sense of efficacy.
Intrinsic Motivation	Deci (1975; 1980)	There is an inherent human tendency to be self-motivated. To seek out challenges and novelty implied a sense of competence and self-determination.
Learned Optimism	Seligman (2006)	Learned optimism is a

		<p> coping style and a personality pattern whereby the individual ascribes good events to internal, permanent and pervasive factors. Bad events are ascribed to factors that are external and temporary.</p>
Hardiness	Kobasa (1979)	<p>Hardiness is a personality style that has three constituent components i.e. a) a liking of a challenge b) a sense of commitment and c) a sense of control</p>
Dispositional optimism	Scheier and Carver (1987)	<p>A generalized expectancy of favourable outcomes, or an inclination to believe that good rather than bad things will happen to one.</p>
Self-efficacy	Bandura (1977)	<p>A coping style whereby a person confronted by a situation that is threatening or induces tension, believes that they have the ability to behave in the way that is required for the favourable outcome.</p>
Positive Illusions	Taylor and Brown (1988)	<p>In the absence of threat, normal human perception reveals evidence of modest degrees of aggrandizement, an illusion of control and unrealistic optimism.</p>
Subjective Vitality	Ryan and Frederick (1997)	<p>A specific, continuous, subjective experience of possessing energy, enthusiasm and aliveness, which is considered to be a reflection of both organismic and psychological wellness.</p>

### 3.6 Positive Psychology and Prevention of Illness

The understanding of the importance of preventative measures in terms of disease and illness has been documented in classical writings and ancient medical texts

(Strümpfer, 2005). Work on primary prevention has, in the past few decades, become of increased importance and relevance (Jaffe, Albee, & Kelly, 1984; Seeman, 1989). Supporters of the movement towards primary prevention advocate, firstly, a model of health that provides an alternative to the illness/ disease model, and secondly, one that is concerned with building adaptive strengths and coping resources in people (Seeman, 1989). Seligman and Csikszentmihalyi (2000) envisioned that the task of prevention in the new century will place emphasis on the creation of a “science of human strength”, the mission of which would be the understanding and fostering of positive virtues in young people (p.7). While the field of positive psychology is a relatively new area of psychology, findings from research are already playing a role in interventions that help people to enhance their strengths and develop their potentials for a greater happiness and satisfaction with life (Compton, 2005). It is anticipated that the adoption of the positive psychology paradigm may have a direct effect in preventing many major mental disorders and helping, in turn, to make the lives of clients physically healthier and encouraging the actualisation of high human potential (Carr, 2004; Compton, 2005)

### **3.7 Research in the Field of Positive Psychology**

Since the emergence of the positive psychology movement, local and international researchers have heeded the insistence of Seligman and Csikszentmihalyi (2000) to begin building a body of theory that explores the positive aspects of the human experience. Seligman, considered internationally to be the father of positive psychology, together with Csikszentmihalyi are at the forefront of encouraging the movement away from psychopathology to mental health. Diener (2000) and Myers (2000) have focussed their efforts on subjective well-being, happiness and satisfaction with life while Buss (2000) has concentrated on the evolutionary aspects of happiness. In South Africa, Wissing and Van Eeden (1997) conducted research into psychological well-being and provided important empirical information. Strümpfer (2001), as mentioned before has contributed to the field by proposing the term psychofortology as a conceptualisation of the science of strengths.

Research in this field completed by postgraduate students at the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth has contributed to the body of a local foundation of knowledge in positive psychology. Cairns (2001) explored the coping resources and sense of coherence of cancer patients while Vorster (2002)

examined the subjective well-being and purpose of life of elderly men and women in a residence for the aged. Brown (2002) conducted research into the biopsychosocial coping and adjustment of medical professional women and van der Walt (2002) explored the general health and subjective well-being of stroke survivors. Kirsten (2003) conducted research into the psychofortology of female nurses while Hatuell (2004) examined the subjective well-being and coping resources of overweight adults. Gal (2004) researched the subjective well-being and anxiety levels of full-time employed married mothers and Smith (2006) explored the psychofortology of post-graduate learners in the Faculty of Health Sciences at the NMMU. In a similar study, Ferreira (2007) explored the psychofortology of men and women undergoing infertility treatment. These researchers, together with many others not mentioned here, are contributing to the growing body of research and providing valuable insight into the everyday successes over daily stressors in the lives of people.

### **3.8 Conclusion**

This chapter has considered the theoretical context of the relatively new field of positive psychology and has provided a discussion of this field's unique focus on strengths, resources and inherent human ability to overcome and persevere through challenges. The pathogenic paradigm was discussed and the concepts of salutogenesis and fortigenesis were explored in greater detail. Positive psychology has a powerful role to play in the understanding of what helps people maintain strength and integrity in the face of stress, whether the stress is the hassles of daily living, or a life altering event.

For the purposes of this study, the psychofortogenic constructs of coping (i.e., coping resources and the sense of coherence) and subjective well-being (i.e., satisfaction with life and happiness) were explored and will be discussed. The following chapter provides a discussion of the concepts of stress, coping, coping resources and sense of coherence.

## **Chapter 4**

### **Stress and Coping**

#### **4.0 Introduction**

The high demands and fast pace of the modern lifestyle has, over the last few decades, placed the spotlight of research on the field of stress and coping. The need to understand the impact of stress on physical and psychological health and knowledge of what helps individuals cope with stress has become increasingly important. Positive psychology seeks to understand the manner in which stress affects individuals, the personal characteristics that promote successful coping, and the reasons why some individuals experience and perceive the same stressor differently to others. This chapter considers the theoretical context of some core concepts in the field of health research. Various models of coping are presented to illustrate the growth in the scientific understanding of these concepts. This chapter also explores the role of coping and coping resources in the promotion of wellness and its importance in mediating the stress response. Hammer and Marting's (1988) model of coping resources, which was adopted for the purposes of this study, is reviewed and other models of coping resources are briefly explored. Antonovsky's (1988) salutogenic construct of the sense of coherence is explored in depth.

#### **4.1 The Concept of Stress**

The substantial amount of research in recent years devoted to the subject of stress has highlighted the fact that stress has a profound effect on the lives of people (Hobfall, 1989). Literature reviews have also pointed to the fact that stress may contribute to problems affecting physical and mental health. One of the more renowned figures in stress research, Hans Selye, described the dilemma of finding a suitable definition for the concept of stress as being somewhat like "relativity... a scientific concept which has suffered the mixed blessing of being too well known and too little understood" (1976, p.7). The word 'stress' has become a part of everyday language and while most people would have a general understanding of the meaning of the term, it may mean a variety of things at different times to the same person (Dore, 1990). It is perhaps this expansive quality that, despite the widespread use of the word stress in colloquial and academic references, researchers have found difficulty in reaching a consensus regarding a definition of the term (Monat & Lazarus, 1977; Romano, 1992; Sheridan & Radmacher, 1992). The difficulty in

providing an all-encompassing definition for stress makes it beneficial to briefly describe the earlier approaches to stress as a historical context for more widely accepted modern theories.

#### 4.1.1. Selye's Response-based Theory

Selye (1982) defined stress as the “non-specific results of any demand upon the body, be the effect mental or somatic” (p.7). He regarded stress as being a general physical response caused by any number of environmental stressors and therefore as being primarily the body's physiological response to a stimulus. Selye's response theory of stress, called the general adaptation syndrome, consists of three stages: alarm, resistance and exhaustion (Sutherland & Cooper, 1990; Weiten, Lloyd & Lashley, 1991). During the first stage, the body has an alarm reaction when it perceives the possibility of a threat to its integrity. If this threat continues or is prolonged, the organism progresses to the second stage of resistance. During the second stage, the body tries to cope with the threat by altering physiological responses in order to stabilise itself. If the stress is sustained or becomes chronic, the organism enters the third stage during which body's resources become depleted, resistance declines, physiological arousal declines and the organism becomes exhausted. This reduced state of resistance is termed the “disease of adaptation” (Weiten et al., 1991; Sheridan & Radmacher, 1992). This model is primarily conceptualised in physiological terms and stress is a dependant variable. Approaches using the response-based model tend to be preoccupied with the specification of the particular response or pattern of responses that provides evidence that the person is under pressure from a disturbing environment. The response-based model has received critique from Monat and Lazarus (1977) who stated that the same response pattern may arise from a variety of stimulus conditions, for example, an increased heart rate could be caused as a result of fright, prolonged exercise and cannot exclusively be attributed to stress. The following subsection introduces the Stimulus-based model.

#### 4.1.2 The Stimulus-based Model

This model is defined in terms of external stressors or a disturbing environment that is considered to be disruptive to the individual. Stress, in this particular model is a independent variable in terms of the stimulus causing stress. In terms of this model, an experience is deemed stressful if it leads to a stressful response such as accelerated



heartbeat, sudden shortness of breath and a state of anxiety (Mulhall, 1996). Critique levelled at this model is based on the fact that stress may not be objectively defined as the effect of the environmental conditions without taking the personal characteristics of the person into consideration. Secondly, what one individual considers to be stressful is not necessarily considered to be stressful by another (Lazarus & Folkman, 1984). This critique suggests the need for a model that introduces an aspect of a relational perspective that would suggest that each individual may respond differently to stressors depending upon their relationship and perception of the stressor (Lazarus & Folkman, 1984; Brannon & Feist, 1997). The following section discusses the cognitive interactional model.

#### 4.1.3 The Interactional Model of Stress

In contrast to Selye, Lazarus and Folkman (1984) defined psychological stress as being “a particular relationship between the person and environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (p.19). Their transactional stance, that is their belief that stress occurs in the context of a relationship between person and environment (Brannon & Feist, 1997), places a decided emphasis on psychological rather than physiological factors. In other words and in terms of this model, stress is a subjective perceptual phenomena that is grounded in psychological processes (Smith, 2006). Stress and health, therefore have a reciprocal influence on the individual, with stress having the potential to affect health and in converse, that health may influence the individual’s resistance or coping ability. The effect that a stressful situation may have on an individual is more dependant on the individual’s perception of the psychological situation (Brannon & Feist, 1997; Palmer & Dryden, 1995) than the environmental event or the person’s somatic response. This system could be seen as a cyclic interaction rather than a cause and effect linear relationship since there is continuous feedback during and throughout the appraisal. Stress is thus the resulting imbalance between the appraised demands and the appraised resources (Lazarus & Folkman, 1984)

Rice (1992) highlights the importance of this theory. Firstly, the same environmental event may be interpreted as stressful by one person and not by someone else, thus suggesting that it is a personal cognitive appraisal that makes an event stressful or not. Secondly, the same person may interpret an event as being stressful on one occasion and not on another, which may be due to a variety of

possible changes in personal or physical circumstances. The actual internal or environmental demand placed on the individual may be termed the “stressor” (Sheridan & Radmacher, 1992). According to this theory, the effect of the stressor is mediated by the individual’s appraisal of the stressor in relation to the risk perceived by the person and the perception of the ability to cope with the stressor. This model has become the most widely used approach for stress research but has been criticised by Hobfall (1989). Hobfall’s conservation of resources model is presented in the following sub-section.

#### 4.1.4 The Conservation of Resources Model

Hobfall’s (1989) conservation of resources model suggests that people possess resources that are important to them and they therefore strive to retain, protect and build on their coping resources. Hobfall stated further that the focus of all stress models should be concentrated on the understanding of the resources the individual wishes to conserve. Examples of these resources are (a) material objects such as a home or business, (b) condition resources such as status, seniority, power or marriage, (c) personal characteristics such as self-efficacy and self-esteem, or the (d) means of attaining them such as knowledge or time. Hobfall argued that the individual uses many methods to counteract the possibility of this loss of resources, the most direct method being replacement of resources. Psychological stress, according to Hobfall and Freedy (1993), occurs when resources are threatened, when there is a real or perceived loss of resources, or when there is a lack of anticipated gain after the resources have been invested. In other words, stress is conceptualised in terms of the potential loss of coping resources as experienced in a stressful situation. Although not a model of stress, the following section considers the salutogenic perspective of stress.

#### 4.1.5 The Salutogenic Perspective of Stress

Antonovsky’s conceptualisation of stress and health challenged the traditional perception of stress and its effects. Both lay people and professionals tended to equate stress with unusual, negative or extreme circumstances but Antonovsky (1987) proposed that stressors were an unavoidable part of daily living. Antonovsky (1987) discovered that the experience of stress was not limited to those subjected to oppressive circumstances, but found that people living in relatively benign, sheltered and comfortable circumstances also experienced fairly continuous and serious

stressors (e.g., accidents, physical trauma and psychosocial stressors) in everyday situations. Antonovsky (1987, p.130) stated:

Whether the source of stressors is the internal or external environment, whether they are daily hassles, acute or chronic and endemic, whether they are imposed on us or freely chosen, our lives are replete with stimuli to which we have no automatic, adequate adaptive response and in the face of which we must respond.

Antonovsky, although not formally using the term, was describing social heterostasis, an idea that contrasted with Canon's ideal of social homeostasis (Strümpfer, 1993). A core assumption of this paradigm is "of heterostasis, disorder, and pressure toward increasing entropy" of the living organism (Antonovsky, 1987, p.2). These everyday stressors are not necessarily viewed as negative and could even be considered as potential opportunities to produce positive outcomes, even furthering opportunities for growth (Antonovsky, 1987; 1993).

#### 4.2 Towards an all-encompassing definition of stress

The above discussion of the various models and perspectives of stress highlights the complexity in providing an all-encompassing definition of stress. Schafer (2000) pointed out that no definition of stress is incorrect but that they serve to further clarify and delineate the scope of this field of research. Drawing on the work of Lazarus and Selye, Schafer defined stress as being an "arousal of mind and body in response to the demands made on them" (p.6). This researcher provides three advantages of the above definition. Firstly, the definition implies that stress is an everpresent, universal and inevitable part of living. Secondly, the definition suggests the multifaceted nature of stress in terms of the fact that the stress-response elicits the involvement of virtually every system of the body. In this manner, "body influences mind and mind influences body" (Schafer, 2000, p.6). Thirdly, the definition is significantly neutral and alludes to the wide range of experiences and affects of stress, whether positive, negative or neutral (Schafer, 2000).

Rice (1992) drawing on a wealth of definitions, distinguished between three distinct and possible meanings of stress in contemporary literature. In the first instance, stress may refer to any event or environmental stimulus that causes a person to feel tense or aroused and is located externally to the person. Secondly, stress may refer to a subjective response that is then regarded as the internal, mental state of

arousal. Thirdly, stress may be the body's physiological reaction to demands or damaging intrusions.

In whatever manner stress is defined, it is important to note that, in contradiction to the popular perception of what stress is, it is not exclusively a negative phenomenon. It is the "way in which an individual reacts physiologically, psychologically, emotionally and behaviourally in order to adapt, change and regain equilibrium in response to internal and external pressure" (van der Merwe, 2001, p.1) and therefore may be positive or negative depending on the individual's subjective response. Selye (1976) distinguished between two variants of stress. Eustress refers to the positive stress or arousal, a kind of excitement, energy and enthusiasm that facilitates a healthy level of functioning, creativity and a desire to work, excel and strive towards growth and fulfillment (Klarreich, 1990; van der Merwe, 2001). Conversely, distress refers to excessive, debilitating stress (Everly & Rosenfeld, 1983; Selye, 1976). Stress can also be considered as being neutral or as being neither positive nor negative (Schafer, 2000). Although there is a lack of agreement about a specific definition or conceptualization of stress, recent research into the treatment of stress has focussed on the cognitive-motivational-relational concepts of appraisal and coping (Lazarus, 2000). According to this approach, if the individual changes his or thinking patterns or appraisal of a stressor, this would necessarily influence how the individual relates to that stressor and the resultant behaviour will also change (Lazarus, 2000).

### **4.3 Stress and Illness**

The link between stress and illness has been the focus of many years of theoretical investigation. A number of studies have highlighted the tendency of psychological stress to precipitate a varied range of illnesses from headaches and mouth ulcers to viral illnesses and cancers (Azar, 1999; Ben-Eliyahu et al., 1991; Cairns, 2001 Kiecolt-Glaser & Glaser, 1989). It is thought that stress may lead to illness in three main ways (Friedman, 1989; Monat & Lazarus, 1977). The first is related to the disruption of tissue function through the release of powerful hormones during times of stress. These hormones cause systemic physiological changes, which typically affect the nervous, immune and endocrine systems. The relatively new field of psychoneuroimmunology (PNI), weaves medical science and psychology together in order to investigate the interaction among behaviour, the nervous, immune and endocrine systems (Brannon & Feist, 2000). Psychosocial factors have been shown to

have an influence on the individual's susceptibility and predisposition to disease (Edelman & Kidman, 1997; Kiecolt-Glaser, Marucha, Malarkey, Mercado & Glaser, 1995).

The second group of factors playing a role in the dynamic between stress, coping and health are thought to be psychological in nature (Edelman & Kidman, 1997; Rice, 1992). The idea is that it is not so much the stressful event or situation which is the causal factor of the resultant illness but that the individual's attitudes or coping responses might play a role in the onset of illness. These psychological factors include, for example, the individual's personality type, personal information processing, perception of levels of stress, primary cognitive appraisals, secondary cognitive appraisals, personal attributions as well as belief systems (Rice, 1992).

Thirdly, the social systems in which the individual is embedded have been found to play a discernable role in the interaction between stress, coping and health (Rice, 1992). These social factors include family, work/ school environment, environmental stressors and availability of resources to the individual. Social support is linked to lower rates of mortality (Berkman, 1986), an increased resistance to infectious diseases (Cohen, 1988) and a lower prevalence to heart disease (Seeman, 1989). Research has provided evidence that those individuals with fewer psychosocial resources appear to have a greater susceptibility to mental disturbances and illness when faced with a higher level of stress than individuals who have a relatively high level of social support (Niven & Carroll, 1993; Salovey, Rothman, Detweiler & Steward, 2000).

Whether experiencing positive, negative or neutral stress, the individual needs to be able to manage and cope with the stressors or stressful situation in which he/she finds him/herself. The following section explores the important concepts of coping, coping responses and coping resources.

#### **4.4 Coping**

Eckenrode (1991) remarked that the concept of coping is not unlike that of stress in that both concepts cannot easily be defined. Coping as a construct, then, should preferably be considered as a "metaconstruct under which a number of phenomena are embedded" (Eckenrode, 1991, p.1). The various definitions and conceptualisations of coping have a few similarities that provide a foundation of thought upon which further research may build (Appley & Trumbull, 1986). To begin with, coping is

process-orientated rather than trait-orientated, a process that spans a period of time and not aimed at the finality of mastery (Appley & Trumbull, 1986; Kleinke, 1991; Lazarus & Folkman, 1984). Furthermore, the process of coping includes both behavioural and cognitive acts (Appley & Trumbull, 1986; Rice, 1992). It is not considered to be a 'natural' or automatic process, but a learned pattern of responding to situations that are perceived to be stressful (Brannon & Feist, 1997; 2000). The ultimate purpose of coping is to remove an experienced imbalance between demands and capacities (Appley & Trumbull, 1986). This process, although an active one, may not at times be consciously employed by the individual, and the outcome may not always culminate in a positive, satisfactory outcome (Lazarus & Folkman, 1984; Kleinke, 1991).

Lazarus and Folkman (1984) have defined coping as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p.141). In other words, it is the effort to overcome, relieve or diminish the negative consequences of internal or external demands. Their model of stress and coping places emphasis on the individual's appraisal in determining whether demands become stressors or not. This model has been widely accepted by researchers in the field (Hobfoll, 1989; Matheny, Aycock, Pugh, Curlette & Canella, 1986; Schafer, 2000). Lazarus and Folkman (1984) differentiated between two distinct coping styles: problem-focussed coping and emotion-focussed or palliative coping. Problem-focussed coping refers to the attempt to understand and define a problem and then consider logical, possible solutions. Emotion-based or palliative coping is concerned with the management of emotional distress. Both methods are usually simultaneously employed when a person experiences a stressful situation. These two processes may work together to increase the likelihood of a constructive outcome, or work against each other to hamper the coping process. Lazarus and Folkman (1984) have also outlined two processes that occur when an individual experiences a stressor. These are appraisal and coping.

The appraisal involves an evaluation of the “personal significance of the encounter” (primary appraisal) and an evaluation of the “options for coping”, termed secondary appraisal (Folkman, 1991, p.5). Both the psychological and physical well-being of the individual is taken into account during the primary appraisal (Cairns, 2001) and the question “what can I do?” is asked while the person evaluates the resources available (Evans & Hubbs-Tait, 1991; Lazarus & Folkman, 1984; 1991).

These appraisals are moderated by situational and personal characteristics (Folkman, 1991). For instance, the personal significance of the encounter is largely dependant on the pattern of motivation, values, commitments, goals, beliefs about the world and oneself. If, after the primary appraisal, the demand is perceived as threatening, the process of secondary appraisal begins. During this process, the individual weighs up the perceived threat against a cache of personal resources in an attempt to reduce the emotional and physiological tension. These personal resources may include financial means, social skills, problem solving skills, energy and level of health and well-being (Folkman, 1991). This diverse range of factors and the potential for variance in these factors from individual to individual is the reason for why one person may perceive a particular situation or event as threatening and another appraising the same situation as neutral or challenging.

Coping is the third phase and includes actions, a change in thinking, redefinition of the situation or anything that the individual deems appropriate after the primary and secondary appraisals (Lazarus & Folkman, 1984). The choice of strategy depends largely on the variety of personal and environmental coping resources that are potentially available to the person at the given time (Schafer, 1996; 2000).

The abovementioned section discussed the concept of coping in general. The following section looks at different types of coping.

#### 4.4.1 Coping Types

Coping has two primary functions, namely to manage or alter the problem that is causing distress, and to regulate the individual's emotional response to the problem. According to Lazarus and Folkman (1984), the first function can be referred to as problem-focused coping while the second can be termed emotion-focused coping. Research has shown that the problem-orientated coping style is either unrelated to or plays a role in improved mental health. In contrast, the emotion-focused coping style has been linked to increased state of distress (Parker & Endler, 1996).

##### 4.4.1.1 Problem-focused Coping

Problem-focused types of coping are used when situations are appraised as having the potential to change. The purpose then of this type of coping is to resolve the problem or to do something that will change the source of stress (Lazarus & Folkman, 1984). The person will try to define the problem and make an attempt at seeking

possible solutions (Bishop, 1994). Examples of problem-focused coping include methods of cognitive problem-solving and decision-making. This method of coping directs efforts towards a process of defining the problem, generating alternative solutions, weighing the alternatives in terms of a cost-benefit analysis, choosing the most viable option and acting upon the decision made (Hatuell, 2004). Problem-focused coping is chosen when people feel that they can constructively change the situation by means of an active engagement with the stressor (Lazarus & Folkman, 1984).

#### 4.4.1.2 Emotion-focused Coping

Emotion-focused type of coping includes cognitive processes but these are directed at diminishing emotional distress and are used when situations do not appear to have the potential to change (Bishop, 1994). This type of coping is used when people feel that the stressor is something that must be endured (Folkman & Lazarus, 1980). The behavioural aspect of emotion-focused coping includes engaging in physical exercise, meditation and seeking out emotional support (Lazarus & Folkman, 1984). Emotion-focused coping, which often entails avoidance-orientated coping (e.g., denial, avoidance and selective attention) has been associated with general distress, depression and the amplification of future problems (Mitchell, Cronkite & Moos, 1983).

This subsection discussed the two primary styles of coping, namely problem-focused coping and emotion focused coping. The following section briefly explores coping style.

#### 4.4.2 Coping Style

Coping style has been defined by Olf, Brosschot and Godaert (1993) as the use of similar behaviour across situations. This view suggests that individuals do not face the each coping context or situation with a fresh way of coping, but rather superimposes a preferred set of coping strategies that remains relatively fixed across time and circumstances (Cairns, 2001; Carver, Scheier & Weintraub, 1989). The idea that coping styles are stable and fixed is controversial and in contract to the ideas of Lazarus and Folkman (1984) who comment that the coping process is dynamic in nature, changing form situation to situation and moving from stage to stage. Folkman (1991) stated that although there has to be some manner of stability in coping



processes in order to have an effective outcome on psychological wellbeing, physical health and social functioning, the process is not a stable one.

Another idea related to individual differences and coping is related to personality dimensions. Carver, Scheier and Weintraub (1989) suggested that certain personality characteristics predispose people to cope in a pattern of ways. These patterns are preferred coping strategies and are used in a variety of situations. Their study also found links between coping strategies and more traditional personality variables such as optimism, self-control, self-esteem and hardiness. The next section examines the types of coping responses.

#### 4.4.3 Coping Responses

Coping with a stressor does not automatically mean that the coping strategy used is constructive. Coping behaviour or responses may be positive or negative, active or avoidant, direct or indirect and may include seeking help, gaining information or diverting attention (Rice, 1992). Weiten, Lloyd and Lashley (1991) divided coping into two groups, namely: (a) maladaptive or with limited values, and (b) constructive-adaptive. Coping processes that are of limited value include giving up, lashing out at others, indulging in self-blame and defensive coping. Costa and McCrae (1986) noted the most effective coping responses as seeking help, communication, using humour, self-confidence, a feeling of control, maintaining faith and drawing strength and meaning from adversity. The least effective coping responses, by contrast, includes hostility, indecisiveness, self-blame, avoidance, and withdrawal from the experience. Weiten et al. (1991) defined constructive coping as “those efforts to deal with stressful events that are judged to be relatively healthy” (p.103). Constructive coping, however, does not guarantee a successful or desired outcome (Kleinke, 1991; Weiten et al., 1991). Weiten et al. (1991) documented the following guidelines as applicable to constructive coping:

1. Constructive coping confronts problems directly.
2. Constructive coping involves realistic appraisals of the stressors and coping resources.
3. Constructive coping seeks to recognise and occasionally inhibit potentially disruptive emotional reactions to stress.
4. Constructive coping seeks to exert control over potentially harmful or destructive habitual behaviours.

The abovementioned section considered the coping responses available to an individual and also looked at what constitutes constructive coping. The following section explores the psychofortigenic construct of coping resources.

#### 4.4.4 Coping Resources

Coping resources, as a construct falls within the salutogenic and positive psychology paradigm. A number of coping responses are available to the individual during the coping process and the construct attempts to explore the health and healthy behaviours rather than disease. Many researchers have explored and defined coping resources in various ways (Schafer, 1996). Hobfall (2001) noted that the role of coping resources is the mediation of the stress response and the promotion of wellness. Although the understandings and conceptualisations of other researchers will be explored in the following section, Hammer and Marting's (1988) definition of coping resources will be used for the purposes of this study.

##### 4.4.4.1 Models of Coping Resources

Literature reviews on the topic of stress and coping reveals a decided emphasis on the role of the individual's subjective appraisal of the situation, the stressor, and the perceived ability to cope with the context in which individuals find themselves (Matheny, Aycock, Curlette & Junker, 1993). Lazarus and Folkman (1984) as the major proponents of this view, regarded stress to be as the result of an imbalance between appraised demands and appraised resources.

Hobfall (1989) proposed a model detailing the conservation of resources to be of utmost importance in the coping process and placed emphasis on the potential loss of resources as a central factor considered by the individual when faced with threat (Rice, 1992). Hobfall (2001) defined an event as demanding, based on whether the person's coping ability is adequate to meet the demand. According to this model, resources are the most effective units for understanding the dynamic relationship between stress and coping. This researcher further stated that people constantly strive to retain, protect and build up coping resources, and threat is perceived as loss or the possibility of potential loss of these resources. Hobfall (1989) defined resources as "those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions or energies" (p.516). Examples of these resources, as

described by Hofall (1989) include self-esteem, learned resourcefulness, socio-economic status, self-mastery and employment.

Rice (1992) stated that “resources are the basic supplies of coping strategies” (p.272) and that these resources may be personal, physical or social. Personal resources include self-esteem, self-denigration, perception of control and self-efficacy. Physical resources may include the following: satisfactory health and energy to meet the demands of the situation; and practical resources such as housing and money. Social support is considered to be a central coping resource as it provides protection from the detrimental effects of stress and is directly valuable and beneficial in itself (Rice, 1992).

Lazarus and Folkman (1984) added to the list of coping resources by stating that health and energy, positive belief, problem-solving skills, social support and material resources are of the most important resources an individual would need in order for an individual to cope with a perceived stressful situation. Their research placed great emphasis on the individual’s belief about resources. The implication is that the person’s perception of believing themselves to be capable of managing or changing a stressful situation, and thereby experiencing a sense of mastery in terms of their own emotional distress, are the most important means of coping.

Hammer and Marting (1988), whose model of coping resources was adopted for the purposes of this study, posited that people make use of coping resources to facilitate more effective management of stressors. Their research defined coping resources as “those resources inherent in individuals that enable them to handle stressors more effectively, to experience fewer or less intense symptoms upon exposure to a stressor or to recover faster form exposure” (p.2). Their model further provides a comprehensive structure in which five domains of functioning are assessed: cognitive, social, emotional, spiritual/philosophical and physical.

The cognitive domain investigates the extent to which an individual maintains a positive sense of self-worth including a positive outlook towards others and a general optimism regarding life. The social domain explores the degree to which the individual is embedded and operated within social networks that would be able to provide support during times of stress. The emotional domain examines the degree to which an individual is able to express and accept a range of affect, based on the assumption that a range of emotional responses is instrumental in diminishing the long-term negative consequences of stress. The spiritual/philosophical domain is

concerned with exploring the degree to which an individual's actions are guided by stable and consistent values derived from religious, familial or cultural traditions or from personal philosophy. Lastly, the physical domain investigates the degree to which individuals, in taking responsibility for their own well-being, adopt and enact health-promoting behaviours to contribute to increased physical well-being.

There are two different models concerning the impact of psychosocial coping. The first, termed the direct-effect model assumes that these resources have a beneficial effect on psychological health, regardless of whether the stress is present (Cassel, 1976). Secondly, the buffering model posits that coping resources may have a moderating influence on the negative influence of stressors on health (Cobb, 1976; Cohen & Willis, 1985). Despite theoretical controversies surrounding these two models, research has found there to be enough empirical evidence to support these models (Cairns, 2001).

The previous section contained a broad overview of the concept of coping resources. The questions surrounding the factors that facilitate positive appraisal of stressful situations have encouraged research into why some individuals in certain situations cope well, overcome adversity and move to a state of health and wellbeing, and why others, facing the same set of circumstances become hopeless, despondent and unwell. The following section of this chapter will explain Aaron Antonovsky's concept of the sense of coherence, a concept that has tried to find answers to some of these questions. For the purposes of this study, the sense of coherence and coping resources have been conceptualised as sub-constructs of the construct of coping.

#### **4.5 The Sense of Coherence**

Remembering that important developments and advancement in any field of study hardly occur in isolation but rather rises from a fertile history of preceding research, it is necessary to refer back to the third chapter of this study. Chapter 3 explored the paradigms of the traditional biomedical model, which was pathogenic in focus, the emergence of health psychology, Antonovsky's (1979; 1987) salutogenic model and the growing new field of positive psychology. Bearing these four contexts in mind, the concept of the Sense of Coherence (SOC) is discussed.

Antonovsky's (1979; 1987) developed the construct of the SOC in an attempt to explain how and why the human system can cope successfully with stressors and move towards a positive state of health. The formulation of the SOC also endeavoured

to explore the reasons why, despite the exposure to a constant stream of stressors, some individuals maintained their state of health and why others who were exposed to the same circumstances and levels of stress, succumbed to illness and a state of being unwell (Levert, Lucas & Ortlepp, 2000). The following section examines the understanding of generalised resistance resources.

#### 4.5.1 Generalised Resistance Resources (GRRs)

Van Niekerk et al. (2000) commented that an individual's position and direction of movement along Antonovsky's (1979; 1993) health-ease-dis-ease continuum are determined by an interplay of the opposing forces of environmental threat, their resistance resources and the strength of their SOC. Antonovsky (1987) differentiates between two types of these resistance resources. The first is called specific resources, which refer to a particular resource found to be helpful in a specific situation (Van Niekerk, et al. (2000) and the second is termed generalised resistance resources (GRRs). These GRRs refer to broad categories or resources that serve to assist people to manage stress in any stressful situation (van Niekerk, et al., 2000). In an early definition, Antonovsky (1979) termed GRRs to be "any characteristic of the person the group, or the environment that can facilitate effective tension management" (p.99). He later refined this definition by eventually defining GRR's as a "property of a person, collective or situation which as evidence or logic has indicated, has facilitated successful coping with the inherent stressors of human existence" (Antonovsky, 1996, p.15). As described by Antonovsky (1979), GRRs include the following:

- Physical and biochemical GRRs that include immunosuppressors.
- Artefactual material GRRs that refers particularly to money, a resource that not only buys material goods but is also instrumental in gaining power, status and services.
- Cognitive GRRs including in particular knowledge and intelligence.
- Ego integrity and ego strength.
- A mastery of flexible, rational and far-sighted coping strategies.
- Interpersonal relational GRRs such as social support and commitment to one's social group.
- Cultural stability.

- The macrosociocultural GRRs that includes a stable set of values and beliefs derived from one's philosophy or religion.
- A preventative health orientation.

#### 4.5.2 The Components of the SOC

Antonovsky (1987) viewed all GRRs as having the common quality to allow the individual who is constantly assaulted with numerous stressors, the ability to make sense of the experience. The repetition of these situations and the repeated reliance on GRRs in time generates a stronger sense of coherence. The SOC construct attempts to explain the facilitation of successful, functional coping in the face of a multitude of complex stressors confronting the individual in everyday living towards a sense of health and well-being (Antonovsky, 1984; Antonovsky & Sagy, 1986; Levert et al., 2000). The definition of the SOC was first formulated in 1979 and later redefined in Antonovsky (1987) to be read as follows:

The sense of coherence is a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (a) the stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable; (b) the resources are available to one to meet the demands posed by these stimuli; and (c) these demands are challenges, worthy of investment and engagement. (p.19)

Antonovsky (1987; 1993; 1996), deriving the three components of comprehensibility, manageability and meaningfulness from this definition, defined these components in the following way:

1. Comprehensibility refers to the extent to which the individual perceives internal and external stimuli as being clear, ordered, structured and consistent. The individual feels that the information perceived makes sense on a cognitive level. There is also an expectation that the stimuli encountered in the future will also be structured, ordered, in a sense predictable and therefore explicable.
2. Manageability refers to the extent to which the individual believes that the resources needed to meet the demands of the stimuli are readily available. These resources may include the previously discussed personal GRRs or those resources that are controlled by others. An individual with a high sense of

manageability tends not to feel victimised by events or of having the sense of being treated unfairly.

3. Meaningfulness is regarded as the emotional counterpart to comprehensibility and refers to the perception that the demands dictated by one's environment are challenges worthy of the investment of interest and energy. People with a high sense of meaningfulness regard the daily hassles as challenges rather than inconvenient experiences or unwelcome burdens.

These three components have been found to be “strongly interrelated” (Feldt, Kinnunen & Mauno, 2000, p.462) and inextricably intertwined (Antonovsky, 1987).

#### 4.5.3 The Sense of Coherence and Coping

It is important to note that the SOC is not to be considered as a coping style (Schwellnus, 2001). A strong SOC is essential for coping with the potentially stressful situations that form part of everyday life. It also facilitates the efficient mobilisation of effective coping resources (Antonovsky, 1987; 1996; Levert et al., 2000).

The strength of the individual's SOC is paramount to the regulation of the ongoing tension generated by constant stressors. An individual with a strong/high SOC are able to cope more efficiently with stress and are less likely to succumb to illness (Hittner, 2000). The stronger the SOC, the smaller the likelihood of the individual perceiving situations as threatening or dangerous (Antonovsky, 1993) and the greater the likelihood that the individual will engage in health promoting behaviours. People who consider life to be meaningful, who believe themselves to have adequate resources, and who perceive their lives to be ordered and understandable, also believe that it is worth investing time and energy in health promoting behaviours. Individuals with a high SOC have been found to enjoy a more positive outlook in terms of their future and had a greater sense of optimism, which in turn, helps them to successfully meet daily challenges (McSherry & Holm, 1994). Even if the person with the strong SOC appraises the stimulus as a stressor, he/she is more likely to diminish the effect of it by perceiving it as being relatively harmless or manageable. This ability would then prevent the transformation of tension into stress and because this tension is managed effectively, the outcome of the experience will be either neutral or salutary.

Antonovsky (1987) also professes that the person with the strong SOC is particularly adept at selecting a particular coping strategy that seems to be the most appropriate to deal with the particular stressor in the particular moment. These

individuals are also more capable of combining a range of coping responses and resources from their cache of specific and generalized resistance resources. Having made this selection and combination, the person with the strong SOC is better equipped to cope with the stressor at hand (Sheridan & Radmacher, 1992). In this sense, the SOC could also be understood in terms of the individual's ability and readiness to co-ordinate, mobilise and use personal resources to their maximum level of functionality. This readiness can be regarded as separate and independent of the level and type of resources available to the individual (Suominen, Blomberg, Helenius & Koskenvuo, 1999).

The person with a strong SOC however, does not necessarily view their entire world as being comprehensible, manageable or meaningful, but may set personal boundaries that may be flexible, wide or narrow but what happens outside these boundaries does not cause them any distress (Cairns, 2001). Antonovsky (1987) emphasised that there are four aspects that cannot be excluded if a person is to develop and maintain a strong sense of coherence. These are:

1. Their own feelings.
2. Immediate interpersonal relations.
3. The major sphere of activity (usually work).
4. The existential issues of death, inevitable failures, shortcomings, conflict and isolation.

A person with a weak SOC, by contrast, would perceive internal and external stimuli as incomprehensible disorder rather than meaningful information. They would feel victimized by the unfairness of life events that appear uncontrollable. Little in life would appear meaningful or having purpose and their lives would be perceived as being filled with relentless onslaught of difficult demands and unwelcome burdens (Antonovsky, 1987). The unavoidable stimuli will be perceived as negative, threatening or dangerous, leading to a state of mental paralysis and negative self-fulfilling prophecies; they are more likely to give up without investing effort in finding resources or developing coping strategies (Antonovsky, 1993). Individuals with a low SOC are more likely to experience psychological distress prior to stressful situation and maintain these high levels of distress after the experience (McSherry &



Holm, 1994). According to Antonovsky (1993), people with a low SOC also lack the “motivational and cognitive basis for the active coping, positive or negative” to avoid a threat (p.207). The SOC is considered to be a central construct in determining the individual’s wellness in terms of the individual’s location and movement on the health-ease-dis-ease continuum (Wolff & Ratner, 1999).

#### 4.5.4 The Development of the SOC in the individual

Antonovsky (1993) stated that the SOC is an orientation that emerges out of childhood, adolescence, and early adulthood, at the end of which the individual has become located at some point on the SOC continuum. It develops as a function of the experiences of those early years of life and as a result of the person’s ability to use and develop the GRRs available to them (Antonovsky, 1987). The relationship between the SOC and the GRRs maybe viewed as reciprocal and dynamic as the individual’s positive perception of the GRRs strengthens their SOC (Wolff & Ratner, 1999). If there are deficits in an individual’s GRRs, the person will not cope effectively. These deficits were termed by Antonovsky (1987) as Generalised Resistance Deficits (GRDs).

In addition to the factors of GRRs and GRDs, Antonovsky (1987) discussed three types of life experiences that serve to shape the development and strength of the SOC. These include:

1. Consistency: This refers to a person’s need for consistent, stable and predictable, structured behaviours in different contexts and contributes to the cognitive component of the SOC, that being comprehensibility.
2. Load Balance: This refers to the perceived availability of resources to meet the demands placed on the individual. If a person perceives the amount of available resources as being inadequate to meet the amount of demands, the situation is seen as overload. Alternatively, someone experiencing an underload, may feel that there is a lack of opportunity to use all their resources, actualise their potential and explore their capabilities.
3. Participation in valued decision making: This factor plays a role in forming the emotional and motivational aspects of the meaningfulness component of the SOC. Participation involves choosing to understand an experience, deciding whether or not the rules of the game are legitimate, and fitting with the individual’s value system and then solving the problems and tasks posed by the experiences.

The extent and intensity of these life experiences are largely determined by the individual's culture, position in the social structure, the kind of work that they do, family structure and the input from factors as diverse as gender, ethnicity, and genetic factors (Antonovsky, 1996). It is thought that the SOC more or less crystallises at the age of 30 (Antonovsky, 1979).

#### 4.5.5 The Research Value of the Sense of Coherence

Antonovsky (1987) developed a 29-item Sense of Coherence Questionnaire (SOC-29) that has already been translated into a number of different languages in order to provide the means to measure this concept (Frenz, Carey & Jorgensen, 1993). Many studies have been conducted worldwide (e.g., Frenz et al., 1993; McSherry & Holm, 1994; Smith & Myers, 1997; Suominen et al.1999; Wolff & Ratner, 1999). The conclusions reached by many of these researchers is that a strong SOC heightens the probability of distress resistance. A number of South African studies have confirmed these results for a South African population (e.g., Carstens, 1995; Munnik, 1997; Wissing & van Eeden, 1997). The SOC is considered to be a universal construct that is meaningful across barriers of gender, social class, region and culture (Antonovsky, 1996; Levert et al., 2000), making it a valuable and appropriate construct in the context of research in South Africa. South African researchers, Wissing and Van Eeden (1997), investigated the validity and cross-cultural applicability of the measure and found it to have an adequate validity and some of these studies also confirmed the universal applicability and validity of the construct across gender, age and culture.

The measure has been used successfully in research conducted at the University of Port Elizabeth (now the Nelson Mandela Metropolitan University) and the studies have confirmed the reliability and validity of the scale (Brown, 2000; Cairns, 2001; Madhoo, 1999; Smith; 2006).

#### 4.5.6 Coping Resources and the Sense of Coherence

Matheny, Aycock, Pugh, Curlette and Canella (1986) remarked "increasing one's resources should positively affect the equation between perceived demands and resources at the appraisal stage" (p.553). It follows that an individual with a perceived adequate or high level of resources should be less likely to appraise a situation as negative or threatening. It appears then, that resources serve to facilitate the appraisal process even to the point that demands are not even appraised as stressors (Cairns,

2001). From these results and conclusions drawn by Matheny et al. (1986), it is possible to note remarkable parallels between the coping resources and the SOC. An individual with a strong SOC more readily draws on the GRRs available to him/her that in turn leads to a more positive appraisal of their situation and a perception of manageability. Research conducted by McSherry and Holm (1994) suggested a strong link between the SOC and cognitive appraisals with subjects who reported a low SOC feeling less confident to cope with the situation than those with a high SOC. Those with a high SOC also reported significantly higher levels of perceived coping resources.

#### **4.6 Conclusion**

Chapter 4 provided a discussion of stress, coping, coping resources and the sense of coherence. Various theories and models were presented and the value of studying fortigenic concepts like coping resources and the sense of coherence were highlighted. Hammer and Marting's model of coping resources was adopted for the purposes of this study as it represents a biopsychosocial conceptualisation that is relevant to the present study and its exploration of the description of the coping resources of women undergoing infertility treatment. It is a field that continues to receive academic attention as it is becoming increasingly important to understand how people manage to stay well and find meaning despite daily stressors and hardships. For the purposes of this study, the concept of coping (i.e., coping resources and sense of coherence) together with the construct of subjective well-being (i.e., satisfaction with life and happiness) constitute the construct of psychofortology. The following chapter considers the construct of subjective well-being in greater detail.

## **Chapter 5**

### **Subjective Well-Being**

#### **5.0 Introduction**

The last two decades have seen a dramatic shift in the focus of psychology from a prime focus in the cause and symptomology of psychopathology, to an exploration of the antecedents and consequences of happiness, self-esteem, optimism, and other indicators of positive well-being (Lucas, Diener & Suh, 1996; Seligman & Csikszentmihalyi, 2000). Scientific research in the area of subjective well-being has partially developed and been cultivated in response and reaction to the overwhelming focus on negative states in psychology (Diener et al. 1999). Eysenck (1990) noted that psychology textbooks over the past century devoted as much as twice literary space to unpleasant emotions as positive emotions. Happiness has been recognised as psychologically important for many aspects in the lives of human beings. It has, therefore, become a field of research that has attracted interest from many fields of psychology. The field promotes an interdisciplinary approach and draws on research from diverse areas of the social sciences and psychology. The conditions of happiness and satisfaction with life have been studied, for example, within the realms of clinical psychology, cross-cultural psychology, social psychology, industrial/ organisational psychology and personality psychology (Strack, Argyle & Schwarz, 1991). The exploration of psychological well-being and its influencing and contributing factors is an area of research that can be placed under the paradigm of positive psychology. This chapter reviews the theory and research in the area of subjective well-being with a specific focus on satisfaction with life and happiness.

#### **5.1 Defining Subjective Well-being**

Diener (1984) noted that definitions of subjective well-being can be grouped into three general categories. Firstly, well-being has been defined by external criteria such as virtue or holiness. Diener (1984) noted that normative definitions imply that happiness is subject to the possession of a desirable quality, rather than it being a subjective state. For example, Diener (1984) noted that Aristotle's concept of eudaimonia, believed to have been achieved by leading a virtuous life, does not mean that virtue leads to joy. Instead, Aristotle had been prescribing virtue as the normative standard against which the lives of people could be judged. An individual could then only be happy if and when subscribing to the norm. Diener (1984) then concluded that

eudaimonia could not be equated to the modern definitions of happiness because it is a judgement made from a desirable value framework rather than a subjective state. Secondly, social scientists have focussed on the question of what leads people to evaluate their lives in positive terms (Diener, 1984). This definition of subjective well-being has come to be labelled satisfaction with life and relies on the standards of the individual to provide their definition of the good life (Compton, 2005). Thirdly, scientists have considered subjective well-being in terms of the extent to which positive emotion has a higher incidence than negative emotion. The emphasis is on pleasant emotional experience and is termed happiness (Diener, 1984).

Definitions and conceptualisations of the construct of subjective well-being are often not explicit in the literature (Diener, 1994). Diener et al. (1999) understood subjective well-being as a general area of scientific interest rather than being a single specific construct and provide a definition of subjective well-being as being an individual's evaluation of their own lives (Diener, 2000). According to Diener (1984) there are three important areas in subjective well-being:

1. It is subjective, meaning that it resides within the experience of the individual. The person's perception of his/her own life is therefore privileged and the individual's beliefs and emotions concerning their well-being are of highest importance.
2. Subjective well-being focuses on positive measures, (e.g., satisfaction with life) as well as the absence of negative factors.
3. Subjective well-being measures offer a global assessment of all facets of a person's life and provides the possibility of gaining an integrated judgement of the person's life.

Subjective well-being has been found to be characterised by temporal stability and cross-situational consistency which suggests that a person's experience of well-being tends to remain stable in a variety of conditions across time (Diener, 1994; Diener & Larsen, 1993; Larsen & Diener, 1984). Although the person's emotional state may fluctuate in response to varying situations, the person eventually adapts and returns to an individual baseline of emotion in time (Diener, 1994). The above section explored the definition of subjective well-being. The components of subjective well-being are considered in the following section.

## 5.2 The Components of Subjective Well-being

Many past researchers have regarded subjective well-being as a unified construct, but it has become increasingly apparent that there are separate components that exhibit unique patterns of relations with different variables (Diener, Suh, Lucas & Smith, 1999). Researchers recommend that each of the specific constructs be understood and explored in their own right but notes that the components appear to correlate substantially which suggests the need for a higher order factor (Diener et al., 1999; Stones & Kozma, 1985). Subjective well-being is a broad category of phenomena that includes people's emotional responses, domains satisfactions, and global judgements of life satisfaction (Diener et al., 1999). Myers and Diener (1995) described a high sense of subjective well-being as having "frequent positive affect, infrequent negative affect, and a global sense of satisfaction with life" (p.10). As is evident from this statement, the construct of subjective well-being is understood in terms of two aspects. The first is an affective or emotional component in which subjective well-being is related to the experience of pleasant emotions and the relative absence of negative emotions. Secondly, subjective well-being includes a cognitive appraisal of an individual's experience that provides a gauge of a global sense of satisfaction with life (Diener, 2000).

While a substantial amount of research has been channelled into investigating the separability of positive and negative affect (e.g., Diener, 1984; Diener et al., 1985; Watson & Clark, 1997), the distinction between the affective components of subjective wellbeing and the cognitive evaluation of satisfaction with life have not been subjected to in-depth investigations. Research conducted by Andrews and Withey (1976) found that satisfaction with life formed a separate factor from happiness.

Individuals with low levels of subjective well-being perceive their life circumstances and lives as inadequate or undesirable and would therefore display a predominance of negative affect such as anxiety, depression and anger (Diener, 1994; Diener & Suh, 1997). The life satisfaction component of subjective well-being has generally received less attention in research (Diener, Emmons, Larsen, & Griffin, 1985a). This section examined the components of subjective well-being and explored the extent to which these components are separable. The following section explores in greater depth two of these components, namely satisfaction with life and happiness.

### 5.2.1 Satisfaction with Life (SWL)

Satisfaction with life indicates the way in which individuals view their quality of life, based on their own, unique criteria (Pavot & Diener, 1993). The individual compares personal life circumstances with self-imposed standards, and the degree by which these standards are met. Veenhoven (1991) defined satisfaction with life as “the degree to which an individual judges the overall quality of his life-as-a-whole favourably” (p.10). Life satisfaction is considered to be a general factor related to many areas of the individual’s life that includes family life, housing, work circumstances, income, education, health and social security (Strack, Argyle & Schwarz, 1991). Satisfaction with life is thus the conscious and cognitive judgemental process of the person’s life that is not based on externally sourced criteria (Diener, Emmons, Larsen & Griffin, 1985). The individual judges him or herself by comparing what they think they deserve or expect with what they have in reality. A minor discrepancy results in satisfaction while a larger discrepancy results in greater dissatisfaction with life (Diener et al., 1985). Social comparison has been defined as “the process of thinking about information concerning one or more people in relation to the self” (Woods, 1996, p.250). Social comparison can have an effect on the individual’s satisfaction with life and subjective well-being (Diener & Fujita, 1997). Although satisfaction with life in itself contains an element of pleasure, it is considered to be a construct that is to be differentiated from that of happiness, which is associated with a spontaneous “lift-of-the-spirits” (Campbell, 1981, p.16). The constructs have been found to be non-identical despite evidence of intercorrelation (Andrews & Withey, 1976; Diener, 1994; Lucas et al., 1996).

This section introduced the construct of satisfaction with life. The construct of happiness is discussed in the following section.

### 5.2.2 Happiness

The question of what results in human happiness has plagued great thinkers for centuries. Veenhoven (1991) traced the longstanding theme of happiness and Western thought to three periods: Antique Greek philosophy; Post-Enlightenment West-European moral philosophy, and current Quality-of Life research in the rich welfare states (Veenhoven, 1991, p.7). While philosophers such as Seneca and Plato have contemplated the possibility of happiness, other thinkers have focused on criteria such

as loving others, pleasure, or self- insight (Diener, 2000; Strack, Argyle & Schwarz, 1991).

The ancient Greek philosopher, Aristotle, claimed that there are at least three kinds of happiness. On the first, and most rudimentary level, “ordinary people have the simple idea that pleasure brings happiness” (Eysenck, 1990, p.3). On a higher and more refined level, people equate happiness with success. The third form of happiness, and regarded by Aristotle as the highest level of all, was produced by the “contemplative life” (Eysenck, 1990, p.3).

According to Compton (2005), researchers asking people to report on their happiness, are asking them to report on their emotional state, how they feel about the world and themselves. Happiness can then be referred to as the positive judgement outcome when the individual weighs up negative versus positive affects (Hatuell, 2004; Smith, 2006). Happy people are more likely to experience a greater number of desirable events and have the tendency to interpret and recall ambiguous events as good or positive (Hatuell, 2004).

Seligman (2002) classified positive emotions into three categories: those associated with the past, the present and the future. Emotions associated with the future include optimism, hope, confidence, faith and trust. The past is associated with positive emotions such as satisfaction, contentment, fulfilment, pride and serenity. The emotions associated with the present are differentiated into two distinct classes, namely momentary pleasures and more enduring gratifications (Seligman, 2002). Momentary pleasures include bodily pleasures obtained through the physical senses and include feelings derived through sexual intercourse and physical intimacy, pleasurable perfumes and flavoursome foods. The higher pleasures are considered to have more complex origins and include the feelings such as glee, bliss, comfort and ecstasy (Carr, 2004).

Research has provided evidence that positive affectivity is correlated with the personality trait of extraversion while negative affectivity has shown a correlation with neuroticism (Costa & McCrae, 1980; Watson, 2002). Positive affectivity is considered to temporally stable after the age of 30 (Carr, 2004). It is associated with positive health behaviours such as physical exercise, adequate sleep, maintaining positive social relationships, and working through positive goals (Watson, 2002). Watson (2002) further posited that both positive and negative affectivity originate from experiential components that evolved to address various evolutionary tasks. For



instance, negative affectivity is considered to be a function of the avoidance-orientated behavioural inhibition system to keep the individual or organism from situations that may be dangerous, painful and lead to punishment. Positive affectivity, conversely, is considered to be part of the behavioural facilitation system that promotes the movement of the individual or organism toward potentially rewarding and pleasurable situations (Carr, 2004).

While negative affect gears the individual to sharp action, critical thinking and quick decision making, positive affect is instrumental in facilitating creativity, broadening momentary thought-action repertoires to explore and broaden personal resources and open the potential for learning and growth (Fredrickson, 2001; 2002). Pleasant emotions are more prevalent than unpleasant ones (Diener, Fujita & Sandvik, 1994; Diener, Smith & Fujita, 1995; Seidlitz & Diener, 1993). A study conducted by Walker, Skowronski and Thompson (2003) found that emotion associated with pleasant events decreases in intensity at a lesser rate than the emotion associated with unpleasant events (an effect that the researchers termed the fading affect bias). Autobiographical memory tends to be biased in favour of pleasant emotion (Seidlitz & Diener, 1993; Walker, Skowronski & Thompson, 2003).

Seligman (2002) introduced the term authentic happiness, which he described as finding one's fundamental strengths and using them everyday. These strengths could then, over time, become identifiable positive character traits for the individual. Compton (2005) stated that authentic happiness is the combination of a hedonic focus on positive emotions and a eudemonic focus on virtues and personal growth. Seligman (2002) provides six principles of authentic happiness. These are presented below and include the following:

1. Everyone benefits: Authentically happy people encourage an "everybody wins" strategy.
2. Savouring success: Authentically happy people tap into past successes to deal with problems in the present as well as having the ability to savour success in the present.
3. Social intelligence: Authentically happy people know which strengths to use and which to avoid depending on the person or circumstance.
4. Opening doors: Authentically happy people see opportunities or "open doors" when others see closed doors or focus on lost opportunities.

5. Strengths in couples: Authentically happy people thrive in romantic relationships and see strength in their union.
6. Finding meaning: Authentically happy people derive meaning from life and leave a mark or imprint of their being in the world.

Happy people are healthier, considered to be more successful and socially engaged, and studies have shown that happiness has many other benefits other than merely feeling good (Seligman & Steen 2005). It has been argued that happiness is not merely the events of an individual's life that results in happiness, but rather related to the manner in which the event is interpreted by the individual (Compton, 2005).

This section introduced the construct of happiness. The following section explores the various theories related to the field of subjective well-being.

### 5.3 Theories of Subjective Well-being

A number of psychological theories of subjective well-being have been developed and refined in the past few decades in the hope of creating a theoretical base from which further research could be conducted (Diener et al. 1999). A summary of some of these theories is tabulated in Table 3 below.

Table 3

Theories of Subjective well-being

<b>Theory</b>	<b>Researcher(s)</b>	<b>Description</b>
Bottom-up Theories	Wilson (1967)	Subjective well-being is dependant on external events or situations. Subjective well-being is derived from a summation of positive or pleasurable moments or negative non-pleasurable moments.
Top-Down Theories	Diener (1984)	Individuals are predisposed to experiences and react to events and circumstances in positive or negative ways. Subjective well-being is ultimately determined by global dimensions of personality.

Discrepancy theories	Michalos (1985)	Individuals compare themselves to multiple standards including other people, past conditions, aspirations, levels of satisfaction, needs and goals. Judgements are based on the discrepancies between current conditions and these standards. In an upward comparison, where the standard is higher, subjective well-being is lower. Downward comparisons (where the standard is lower) increases subjective well-being.
Dynamic Equilibrium Model	Heady & Wearing (1989)	Each person has a normal or equilibrium pattern of life events and a normal equilibrium of subjective well-being. Life events may have varying influences on subjective well-being but after a period of time, the person adapts and returns to their baseline of subjective well-being.
Telic theories	Diener (1984); Diener & Fujita (1995)	Different levels of subjective well-being are connected to the goals that people create for themselves. People involved in goal-orientated activities that they believe to be important, are more likely to experience increased levels of subjective well-being.
Pleasure and Pain theories	Diener (1984)	These theories presume that an individual only formulate goals to contend with a perceived lack in that person's life. The majority of goal and need formulations presume, therefore, that a lack or deprivation is a natural and necessary forerunner of happiness. Thus, an inversely proportional relationship exists between deprivation and happiness. These theories also suggest that if the individual's needs are

		completely satisfied, the propensity for happiness greatly diminishes
Evolutionary theories	Buss (2000)	Current biological and mental mechanisms are the end products of a selective evolutionary process. Feelings of happiness are genetically designed to evaporate after a short period in order to prompt the individual to re-enact those behaviours that caused the original feelings of happiness (e.g. feelings associated with copulation and eating)
Autotelic Theories	Csikszentmihalyi (1975)	Activity theories maintain that happiness is a by-product of human activity.

Table 3 presented a summary of the theories of subjective well-being research. The following section explores the predictors of subjective well-being.

#### **5.4 Predictors of Subjective Well-being**

International research has indicated that a number of variables and traits have an influence on subjective well-being. A general consensus regarding the strongest predictors of subjective well-being in Western cultures has been reached (Argyle, 1987; Compton, 2005; Diener et al., 1999; Myers, 1993). Some of these predictors will be briefly explored below:

1. Positive self-esteem.
2. Sense of perceived control.
3. Extroversion.
4. Optimism.
5. Positive social relationships.
6. A sense of meaning and purpose to life.
7. Resolution of inner conflicts or low neuroticism.

##### **5.4.1 Positive Self- esteem**

Positive self-esteem is considered to be an important trait to both happiness and life satisfaction (Diener & Diener, 1995). This trait is associated with adaptive

functioning in nearly every area of life and research has indicated that it is associated with less delinquency, greater anger control, greater intimacy and relationship satisfaction, the increased ability to nurture and care for others, and enhanced capacity for creativity and productive work (Compton, 2005; Hoyle, Kernis, Leary & Baldwin, 1999). High self-esteem provides people with a sense of meaning and value, is important for interpersonal relationships, and is a result of personal growth (Ryan & Deci, 2000). While this is true for Westernised countries, in the East where society is largely collectivist in nature, emphasis is placed on the needs of the community rather than on the needs of the individual (Carr, 2004).

#### 5.4.2 Sense of Perceived Control

This predictive factor refers to the belief that one has some measure of control over possible life events that are considered to be personally important (Compton, 2005). This predictor has in the past, been referred and measured as the locus of control, a concept measured on a continuum from internal to external (Compton, 2005; Rotter, 1966). It was suggested that an individual with an internal locus of control tends to regard outcomes as a result of self-directed efforts rather than attributing the outcomes to external efforts and chance. The individual with the external locus of control has the belief that outcomes are the result of factors outside of the person's internal and immediate control. A third factor, that of chance, is the belief that no internal or external factor is responsible for any outcome. This predictor of subjective well-being has, of late, been refined to be understood as a sense of personal control (Compton, 2005). Peterson (1999) defined the sense of personal control as being the "individual's belief that he or she can behave in ways that maximize good outcomes and/ or minimize bad outcomes" (p.288). Implicit in the concept is the belief that it is possible for the individual to interact with the environment in order to achieve the best possible outcome. It is a dynamic and transactional process, involving the mutual influence of person and environment, and involves cognitive processes such as beliefs and expectations, making choices, working with the consequences of those choices and finally finding meaning through reflection on the process (Compton, 2005; Peterson & Stunkard, 1989). It has been found that the religious belief in a higher or divine power that has control over the life of the individual has a positive effect on subjective well-being (Compton, 2005). Rothbaum, Weisz and Snyder (1982) termed this manner of thinking secondary control. Secondary control allows people to

perceive a sense of control by association with a person, philosophy, or belief system that they personally believe to be more powerful than themselves. The sense of control is heightened by the understanding that the relinquishment of this power to the higher power or the divine was of the individual's own choice and free will.

#### 5.4.3 Extroversion

A person who is considered to be an extrovert is one who is interested in things outside him or herself, for example, physical and social environments, and is primarily orientated to the world exterior to the self (Compton, 2005). A strong correlation between extroverts and higher levels of subjective well-being has been reported in numerous research studies (Diener et. al, 1999; Fujita, 1991; Steel & Ones, 2002). Studies conducted to ascertain the specific way in which subjective well-being and extroversion are linked initially yielded the possibility that the component of sociability was most related to happiness (Bradburn, 1969). Research had also implied a link between well-being and number of friends (Okun, Stock, Haring, & Witter, 1984) as it seemed that the more sociable an individual, the greater the opportunity to foster positive relations and gain positive feedback about themselves. Recent studies, however, have discovered that extroverts do not necessarily spend more time with friends than introverts (Pavot, Diener & Fujita, 1990), yet appeared to be happier than introverts when spending time by themselves (Diener, Larsen & Emmons, 1984). With sociability seemingly not a factor, research has attributed the higher levels of subjective well-being to the extrovert's innate sensitivity to positive rewards (Rusting & Larsen, 1998). They may also have a greater predisposition to experience positive emotions (Lucas, Diener, Grob, Suh & Shao, 2000) that will be mentally recorded and recalled as happy memories. Extroverts may report higher levels of subjective well-being because they are more likely to consider social situations as being more pleasurable and stimulating (Moskowitz & Cote, 1995).

#### 5.4.4 Optimism

Generally, people who are more optimistic about their lives and future, report a greater sense of happiness and satisfaction with life (Diener et al., 1999; Scheier & Carver, 1992). Optimism is considered to be a generalised tendency to expect the best and most favourable outcomes in life and has been linked to perceived health status in that optimistic people report less health related problems (Scheier & Carver, 1992).

Optimism allows for the a positive evaluation of the self, a perception of being in some measure of control in terms of future plans and outcomes, a tendency to successfully interact with others and regard the future with hope and positive expectation (Compton, 2005). Not only does this enhance subjective well-being but also promotes better coping skills and strategies when the individual is under stress. Optimism can be differentiated into a number of understandings. Dispositional optimism refers to the global expectation that things will turn out well in the future (Scheier & Carver, 1992). It is seen as hope, or the belief that one's actions and perseverance will allow goals to be achieved (Snyder, 1994). Optimism may also be viewed as an explanatory style in terms of the way in which people explain the causes of events for themselves (Compton, 2005; Peterson, 2000). Learned optimism, as proposed by Seligman (1990), refers to the process by which people can learn to be more optimistic by paying attention to the manner in which they explain life events to themselves. Schneider (2001) posited that realistic optimism refers to an optimism that does not result in unrealistic or idealistic thinking. It involves the honest recognition that there may be opportunities for positive growth and learning experiences in even the most dire and difficult situations. Schneider (2001) commented that realistic optimism is necessary for enhanced well-being. While the construct of optimism remains an important one for future research for positive psychology, Peterson (2000) cautioned researchers to be responsible in their endeavours and approach the field in an even-handed manner.

#### 5.4.5 Positive Relationships

Positive relationships are seen to be one the strongest predictors of subjective well-being (Diener et al., 1999; Myers, 2000) and serve an important function in the social, psychological and behavioural domains across the life span (Uchino, Cacioppo & Kiecolt-Glaser, 1996). The need for social relationships is considered to be innate and important for human beings (Compton, 2005). It has been found universally across cultures that a positive relationship exists between high subjective well-being and satisfaction with family (Diener, Oishi, & Lucas, 2003). From an evolutionary perspective, it is thought that human beings are designed to derive happiness from a kinship network (Argyle, 2001; Buss, 2000). The two primary aspects related to positive relationships are social support and emotional intimacy (Compton, 2005). Sarason, Sarason and Pierce (1990) have studied the positive impact that social

support can have on subjective well-being. Close relationships between parents and children, between siblings and between extended family members enhance the sense of a broad but close network of social support (Carr, 2004). Having a few close friends or confidantes has been found to correlate positively with happiness and subjective well-being (Argyle, 2000,2001). Friendships and happiness may be associated for the following reasons (Carr, 2004). Firstly, happy people are more often selected as friends as they are more socially attractive than unhappy or miserable people. Second, confiding relationships meet needs for affiliation and enhance the feeling of happiness and satisfaction. Thirdly, close friendships provide social support. The perception of being in a good social relationship is thought to enhance positive self-esteem, successful coping, better health and fewer psychological problems (Compton, 2005). One study showed that the action of seeking out positive social support had a positive ripple-effect on self-esteem, optimism, and perceived control (Aspinwall & Taylor, 1992; Compton, 2005).

In terms of emotional intimacy, studies have shown that being involved in intimate social relationships is a strong predictor of life satisfaction (Compton, 2005; Cummins, 1996) to the extent that this predictor outweighed others such as those of material well-being, health, and leisure satisfaction.

#### 5.4.6 A Sense of Meaning and Purpose

Baumeister (1991) suggested that the creation of meaning is a process of finding a way for our lives to make sense and be understandable. Baumeister (1991) asserted that having a sense of meaning is necessary for four reasons. The first reason is to help find a purpose in life, and thereby establish goals that take cognisance of present place, past achievements and future plans. Secondly, a sense of meaning provides a sense of efficacy or control. Thirdly, it provides a means of justifying actions that in turn facilitates, in turn, the establishment of a foundation for values, morality and ethics. A fourth reason for having a sense of meaning and purpose in life is that it fosters a sense of self-worth through the sharing of similar values amongst a community of like-minded people. Having a sense of meaning and purpose in life is an important predictor of subjective well-being and studies have shown that many people find this in religion (Myers, 2000). Belonging to a religious faith, besides contributing to the individual's sense of purpose, also plays a role in extending the individual's sense of social support, self-esteem and creates a perception of sharing a



common value among a community of people. Regular attendance and ritualistic acts of faith contribute to the sense of social support and belonging while nurturing the meaning and purpose derived from serving beyond the self. Religion also provides a coherent belief system that allows people to find hope for the future (Seligman, 2002) and provides an explanatory framework for life events such as illness and death. Compton (2005) noted that religion also helps to alleviate existential fears of death and allows for a sense of optimism related to the afterlife in which hardship and adversity will be resolved or no longer exist (Carr, 2004). Involvement in religion is often associated with a physically and psychologically healthier lifestyle that is characterised by marital fidelity, altruism, moderation in eating and drinking, a commitment to hard work and the opportunity to reflect on self and others in prayer and meditation (Carr, 2004). It is necessary to note that a sense of meaning and purpose is not exclusively linked to religion and religious beliefs (McGregor & Little, 1998; Compton, 2000, 2005). Research has found that subjective well-being is increased when people are focussed on the active pursuit of a goal that has meaning for them (Oishi, Diener, Suh, & Lucas, 1999).

#### 5.4.7 Resolution of Inner Conflicts or Low Neuroticism

Compton (2005) reported that the third most important predictor of subjective well-being in the inverse relationship with negative emotionality and neuroticism (i.e., the less neuroticism, the higher the subjective well-being). According to research conducted by Donahue, Robins, Roberts and John (1993), the less fragmented the self or the greater the integration and coherence amongst all parts of the self-system, the greater the enhancement of the person's subjective well-being.

Personality studies related to happiness shows that happy and unhappy people have distinctive personality profiles (Diener et al, 1999). In the western and predominantly individualistic cultures, happy people are extraverted, optimistic and have high self-esteem and an internal locus of control (Carr, 2004). Unhappy people, in contrast, tend to have high levels of neuroticism. Carr (2004) noted that extraversion correlates about 0.7 with happiness or positive affectivity while neuroticism correlates above 0.9 with negative affectivity. There is evidence that extraversion and neuroticism predisposes people to experience more positive and negative events respectively. Happier people tend to have more social relationships and are usually more extroverted. This way of relating to the world is mutually reinforcing since the

manner in which the positive individual represent him or herself to the world results in a positive reaction from others and reinforces that persons self-esteem (Compton, 2005).

Traits related to subjective well-being seem to tap into both social interactions and personal characteristics (Compton, 2005). Compton further noted that individuals who have achieved an emotional balance between high self-esteem, perceived control, optimism, sense of meaning, and a few inner conflicts will believe that this balance is permanent. Studies have shown that as much as 50% of the variance on major personality traits such as extraversion and neuroticism may be attributed to genetic factors (Carr, 2004; Pajeris, 2001; Riemann et al., 1997). Optimism, self-esteem and locus of control are considered to be personality traits that correlate positively with subjective well-being but the manner in which genetic and environmental factors contribute to the development of these traits is not known in its entirety (Compton, 2005).

It must be noted that these trends are not universal. Research has found that cultural values play a role in partially determining personality traits that affect subjective well-being. In eastern societies where the culture is predominantly collectivist in nature, the above-mentioned factors do not correlate strongly with subjective well-being (Carr, 2004).

This section explored the seven most important predictors of subjective well-being. The next section provides a brief description of other influential research variables in terms of subjective well-being.

## **5.5 Subjective Well-being and Other Influential Variables**

### **5.5.1 Age**

Research indicates that older persons tend to be more satisfied with life and happier than younger people and that their satisfaction with life tends to increase with age (Argyle, 1999; Horley & Lavery, 1995; Stock, Okun, Haring, & Witter, 1985). Satisfaction with life has been found not to decrease with age (Inglehart, 1990). In a South African study, Vorster (2002) found that most of the participants in the sample, which consisted of retired elderly living in a residence for the aged, experienced levels of satisfaction with life that ranged from slightly satisfied to extremely satisfied. Older people tend to have a smaller discrepancy between their life goals and aspirations and their actual achievements in life (Campbell, Converse & Rodgers,

1976; Compton, 2005). It appears that the more realistic the desires, the more satisfied the individual, and conversely, greater satisfaction results in the promulgation of more realistic desires (Solberg, Diener, Wirtz, Lucas, & Oishi, 2002). Evidence from studies conducted have suggested that people readjust their goals as they age (Campbell, Converse, & Rodgers, 1976; Rapkin & Fischer, 1992) and that, as a result, older adults have less of a discrepancy between their ideal and actual self-perceptions (Ryff, 1995). Argyle (1999), however, has noted that the health problems associated with increasing age tends to have a negative impact on subjective well-being. In comparison to young people, older people tend to be more satisfied with their past achievements but less satisfied with their futures (Argyle, 1999).

### 5.5.2 Gender

Despite the fact that women experience and express more negative internally focussed emotions such as depression and anxiety (Myers & Diener, 1995; Nolen-Hoeksema & Rusting, 1999), studies have found no significant differences between men and women in self-reported life satisfaction or happiness (Nolen-Hoeksema & Rusting, 1999; Compton, 2005). Women, however, report experiencing and expressing all emotions more frequently and more intensely than men (Compton, 2005). For example, women are more likely to experience intense feelings of happiness or joy than men (Fujita, Diener & Sandvik, 1991). A South African study conducted by Wissing and Van Eeden (1997) found significant differences between the subjective well-being of males and females. The researchers argued that the males' higher scores might not be related to a biological cause but may be attributed to cultural, social and role patterns constructed for men and women in the South African society at the time of the study.

### 5.5.3 Race and Culture

Research conducted by Myers and Diener (1995) suggested that knowing the race, culture or ethnic group provides very little information regarding the individual's subjective well-being. Afro-Americans, for example, reported a similar level of happiness as European- Americans and noted that African- Americans may be less vulnerable to depression (Diener, Sandvik, Seidlitz & Diener, 1993; Robins & Regier, 1991; Stock, Okun, Haring, & Witter, 1985). Triandis (2000), has however, noted that specific cultural and socio-political factors have been found to play an important role

in determining happiness. Studies across cultures have consistently found that positive associations between subjective well-being and living in a stable democracy without the turmoil of warring factions, political oppression and military conflict. Levels of subjective well-being are also greater in individualist cultures rather than collectivist cultures. The relationship between the citizens and those who govern them also appears to bear importance of well-being. Carr (2004) noted that studies have shown that subjective well-being is higher in welfare states and in places where matters of state are managed efficiently.

In terms of South African research, a study conducted by Møller in 1982 and 1983 found that Whites, Indians and Coloureds scored considerably higher than Blacks on a composite index of subjective well-being (Møller, 1988). The findings of this research indicated that, at the time, being Black in South Africa, ranked among the 10 most important predictors of overall well-being for the total sample and had a negative influence on subjective well-being. Similarly, Osche (1984) found that Blacks scored significantly lower than Afrikaans and English-speaking Whites on a measure of well-being. Subsequent studies of similar nature consistently gave evidence to reveal that the well-being of Black South Africans lags behind that of White South Africans (Møller, 1996). A possible contributing factor to these findings may be related to the difficult circumstances in which most Black South Africans lived during the Apartheid period (Mokgathe & Schoeman, 1998). Møller (1996) found that factors that influenced South African student's optimism included reform, democracy, racial harmony and national unity.

#### 5.5.4 Health

Subjective health ratings of personal health are influenced more by personality traits, coping strategies than by objective physical health. Diener et al. (1999) found that while subjective ratings of health correlate with happiness, objective health ratings made by health practitioners do not. For example, people with a high trait of neuroticism may complain of ill-health but may be considered healthy by their medical doctor. This trend is supported by evidence from other research studies (e.g., George & Landerman, 1984; Okun, Stock, Haring & Witter, 1984; Watten, Vassend, Myhrer & Syversen, 1997). Positive emotional states facilitate health behavioural practices, aids in psychological coping with health problems and enhances psychological and physical resilience (Salovey, Rothman, Detweiler & Steward,

2000). Weisenberg, Raz and Hener (1998) noted that positive emotions promote the increase of tolerance for pain. Odendaal (1999), in a South African study investigating the subjective well-being of a sample of cardiac patients, found that the participant's subjective well-being ranged from slightly dissatisfied to satisfied with life. Most people adapt to their health problem relatively quickly and develop self-perceptions of their health that correlates with their level of happiness (Carr, 2004). Research suggests that happiness may influence our health as a result of its positive effects on the immune system. The immune systems of people who are happy appear to be more effective than those of unhappier people (Kamen-Siegel, Rodin, Seligman & Dwyer 1991; Salovey et al., 2000; Segerstrom, Taylor, Kemeny & Fahey, 1998).

#### 5.5.5 Marriage and co-habitation

As mentioned previously, the development and maintenance of positive relationships is a strong indicator subjective well-being. In terms of specific types of relationships, research conducted by Myers (2000) has shown that married people are happier than unmarried (including the divorced, separated or never married). A similar relationship has been found in men, suggesting that married men and women obtain the same benefits from being married. Carr (2004) commented that possible reasons for this relationship include the possibility that more happy people are socially more attractive than unhappy people and are therefore more likely to get married than their unhappy counterparts. A second explanation suggests that marriage offers an attractive range of benefits to the couple that in turn makes them happy. These benefits include that it provides a social context within which to have children, a socially sanctioned role as parent and spouse and a context within which to affirm identity, values and posterity. Marriage, as an institution sanctioned both in religious and cultural practice, also provides psychological and physical intimacy (Carr, 2004). Relationships and marriages in which people communicate respectfully and demonstrate forgiveness of each other's faults provide indication of higher satisfaction with life (Harvey, 2002). The relationship between marital status and happiness has been found in 40 nations around the world regardless of whether the culture is individualist or collectivist and regardless of the divorce rate (Diener, et al., 1999).

### 5.5.6 Money, Income and Wealth

In predominantly capitalist driven societies, the primary message given to the consumer is that having more money can buy you more happiness. More money allows access to increased prestige, more power and more material possessions (Myers, 2000).

In a study conducted by Diener and Biswas-Diener (2002), it was found that there was a positive correlation between income and subjective well-being among various countries. On an individual level, studies have found small but relatively significant correlations between the level of income and subjective well-being. Generally, wealthy people have been consistently found to have higher levels of subjective well-being than poorer people but the differences is not as large as common sense would assume (Diener, 2000; Diener, Horwitz, & Emmons, 1995; Veenhoven, 1994). Studies have also shown that an increase in income appears to increase levels of subjective well-being for a short period before the individual reverts to his or her normal level of happiness (Diener, Sandvik, Seidlitz & Diener, 1993). This phenomenon was examined more closely in studies conducted with lottery winners (Argyle, 1999; Brickman, Coates & Janoff-Bulman, 1978). The elation and euphoria after winning the lottery did not last for a long period of time and it was found that winners, after time, reverted to their “pre-windfall” levels of happiness. Argyle (1999) commented that the levels of subjective well-being even decreased in some cases due to the unanticipated life changes and disruptions experienced by the winners.

Research suggests that once a sufficient amount of money is available to afford the basic needs such as physical shelter, food and clothing, but that an increase in wealth to supply things beyond these needs creates a slight difference in levels of happiness. A possible explanation for this occurrence is related to the adaptation level theory (Helson, 1947) that posits that people become accustomed to a certain level of stimulus and adapt to it very quickly. For the person to note a change, the stimulus would need to be increased. Diener and Lucas (2000) noted that the average human being adapts to a change in life within three months.

### 5.5.7 Intelligence and Education

Research has found that intelligence is not related to happiness unless it is low enough to hamper economic success and job opportunity (Carr, 2004; Sigelman, 1981; Watten, Syversen, & Myher, 1995; Wilson, 1967). Diener et al. (1993) found

that a small yet significant correlation exists between level of education and subjective well-being. People with a higher level of education tend to report positive experiences in their past and record emotions associated with pride and achievement (Campbell, 1981). Having a good level of education may inadvertently contribute to a greater sense of self-esteem, goal realisation and self-actualisation (Diener, et al., 1999). However, unrealistic academic expectations could hamper the individual's sense of well-being if there exists a lack of fit between the individual's aspirations and real ability (Clark & Oswald, 1994).

#### 5.5.8 Work

In a study conducted by Argyle (2001), it was found that employment status is related to happiness with the employed being happier than those who were without work. People in professional or skilled work were happier than those in unskilled jobs. Thus, job satisfaction has a moderate correlation with happiness (Diener, et al., 1999). It is suggested that the reason for this correlation may be that work is a potential source of optimal stimulation that the person may find pleasing or pleasurable (Diener, et al., 1999). Work also provides the opportunity to satisfy curiosity, facilitate further skills development. Work-related activity may play a role in extending the person's social support network and serves to foster a sense of identity and purpose (Warr, 1999; Carr, 2004). Jobs that are found to be satisfying are characterised by a good person-environment fit (Warr, 1999) in which the person is required to operate and fulfil functions in work environments tailored to their skills, talents and preferences. Satisfying jobs are also characterised by a modicum of autonomy and a degree of authority in terms of making decisions rather than needing regular directives from higher management (Carr, 2004). Carr (2004) further noted that since happy people are considered to be productive people, and employed people are happy people, it may be said that the relationship between happiness and productivity is bi-directional.

#### 5.5.9 Life events

Despite a copious amount of research conducted to investigate the relationship between life events and subjective well-being, no conclusive results have been reached (Suh, Diener, & Fujita, 1996). In the two year longitudinal study conducted by Suh, Diener and Fujita (1996) in which the effect of good and bad transitory life

events on subjective well-being were investigated, they found that only life events that occurred during the preceding three months influenced the life satisfaction and happiness of individuals. Similar longitudinal studies corroborate the aforementioned findings and suggest that life events or changes do not have a significant effect on subjective well-being over a long period of time, such as 10 years (Costa, McCrae, & Zonderman, 1987; Diener, Sandvik, Pavot & Fujita, 1992; Steel & Ones, 2002). One study, however, found that the life events of marriage and widowhood still produced heightened and lowered subjective well-being respectively as much as six to eight months after the experience (Winter, Lawton, Casten & Sando, 1999).

#### 5.5.10 Physical Attractiveness

While society would hope to put forward that physical appearance and attractiveness are of relative low importance to happiness and satisfaction with one's life, studies show that physical attractiveness appears to be a powerful resource in the Western society (Diener, Wolsic & Fujita, 1995). Attractive people are perceived to be more sociable, dominant, sexually warm, mentally healthy, intelligent, and socially skilled than unattractive people (Feingold, 1992). Research conducted by Diener, Wolsic and Fujita (1995) with the aim of investigating the relationship between physical attractiveness and subjective well-being amongst college students, found a small relation between the two constructs. The researchers postulated that a possible cause for the small correlation be attributed to the adaptation theory of subjective well-being or to the possibility that external variables have less of an impact on subjective well-being than initially thought (Diener, Wolsic, & Fujita, 1995). In a South African study, Hatuell (2004) found that the overweight adults in the sample were generally satisfied with their lives.

#### 5.5.11 Pet ownership

Studies have revealed that owning or caring for pets play a role in enhancing health and increasing longevity (Danner et al., 2001; Keil, 1998; Siegel, 1993). The presence of animals or pets has been shown to enrich an environment (Savishinsky, 1992) and research has shown that animals have a therapeutic value in enhancing happiness, health and sociability (Cusack, 1988). However, not all research studies have cast a positive light on pet ownership and well-being. Brasic (1988), who examined the psychological and physiological effects of pets, found that while it may



prove beneficial for some people, it held adverse effects for others. These findings were supported by research conducted by Taggart (1997) who commented that the relationship between happiness and pet ownership is largely dependant on socioeconomic status. The study showed that greater levels of happiness were reported from those of higher socioeconomic backgrounds, and that those who were less affluent reported less happiness.

This section examined the variables that have been found to have had an influence on subjective well-being and play an important role in understanding what enhances and detracts from subjective well-being.

## **5.6 Conclusion**

The present chapter provided a discussion of the construct of subjective well-being, its components of satisfaction with life and happiness. The theories concerning subjective well-being that have been derived from numerous research studies were also discussed and the strongest predictors and influential variables were explored. While research findings often differ regarding the impact of variables on subjective well-being, the field of subjective well-being and positive psychology has provided a space for dialogue and discovery as researchers and practitioners seek to reveal those factors, which enhance and add joy to the lives of individuals. Most of the research studies cited in this chapter are international and there exists a need for more investigation in the field of subjective well-being in order to closer examine the variables that interact with and influence the individual in the South African context. A number of South African researchers have recently recognised this need and have ventured into the field of subjective well-being (e.g., Hatuell, 2004; Kirsten, 2003; Odendaal, 1999; Vorster, 2002; Wissing & Van Eeden, 1997). The following chapter provides details of the research design and methodology used for this study.

## Chapter 6

### Research Design and Methodology

#### 6.0 Introduction

This chapter provides an overview and description of the research design and methodology employed in the study. The primary aims are outlined, followed by a description of the research design, participants and sampling method used in this study. The biographical questionnaire and four measures used in this study are then briefly described. A discussion of the research procedure and method of data analysis follows and the chapter concludes with a review of ethical complexities considered for the purposes of the study.

#### 6.1 Primary Aims of the Research

This study aimed to explore and describe the coping resources, sense of coherence, satisfaction with life and happiness of women who have undergone infertility treatment at a privately managed health care unit. These four above-mentioned constructs constitute, for the purposes of this study, the very basic construct of psychofortology. The primary aims of the research were:

1. To explore and describe the coping of women undergoing infertility treatment.

This aim specifically entailed the following:

To explore and describe the **coping resources** of women undergoing infertility treatment.

To explore and describe the **sense of coherence** of women undergoing infertility treatment.

2. To explore and describe the subjective well-being of women undergoing infertility treatment. This aim specifically entailed the following:

To explore and describe the **satisfaction with life** experienced by women undergoing infertility treatment.

To explore and describe the **life happiness** of women undergoing infertility treatment.

3. To explore and describe the patterns of coping resources, sense of coherence, satisfaction with life and happiness of women undergoing infertility treatment at a privately managed health care unit.

This study was exploratory-descriptive in nature, thus no hypotheses were stated. The aims outlined above were used to guide the method of the study. The following section provides a discussion of the research design and methodology.

## **6.2 Research Design and Methodology**

### **6.2.1 Research Design**

The research design is a detailed plan of how the research study should be conducted and should be carefully considered and thoughtfully chosen (Thyer, 1993). This study employed a quantitative, exploratory-descriptive research method, in which respondents were asked to complete self-report, survey-type questionnaires. Exploratory research is valuable when attempting to examine a new field of interest or a research field that has not been exhausted and provides an indication of possible future avenues of research (Babbie, 1990; 1992). The exploratory focus provides the opportunity to gather and analyse new data and investigate emergent patterns (Mouton, 1996). In this manner, exploratory research provides an indication of possible areas of further research and serves to expand a field of study (Babbie, 1990; Neuman, 1997).

Descriptive research aims to describe behaviour in its most comprehensive expression (Mitchell & Jolley, 1996). It provides a firsthand opportunity for the researcher to become familiar with new fields of study and phenomena and, in this manner, provides a foundation for future research (Barker, Pistrang & Elliot, 1994). This design allows the researcher to summarise and describe relatively large sets of data (Van Lill & Grieve, 1994) while aiming to portray a detailed profile of a specific individual, group, situation or event (De Vos, 1998; Neuman, 1997). The exploratory-descriptive design also serves to document and describe various processes and relevant factors that affect the phenomena being studied (De Vos, 1998; Neuman, 1997). The advantages provided by an exploratory-descriptive research design lies primarily in its provision of an opportunity to increase the depth of understanding in a field of study, and allows for the development of new theory (Mouton & Marais, 1994). Exploratory research is conducted with the goal of gaining fresh insights into a particular phenomena or field of study and to highlight possible areas of future research. The descriptive design, in turn, allows for a detailed and in-depth description of a specific phenomenon or behaviour (Van Lill & Grieve, 1994). A major disadvantage of an exploratory-descriptive study is that there is no method of

controlling extraneous variables. Cause and effect conclusions cannot be drawn from exploratory- descriptive studies (Burns & Grove, 1993).

The data for this study were collected by using the survey method as each respondent was issued with a biographical and four self-report questionnaires. Studies have established that it is possible to obtain valid and reliable data from respondents using self-completion questionnaires (Bailey, 1987). Survey methods are especially useful when information is subjective and comes directly from the respondent as it provides the researcher with an indication and a measurement of subjective states, attitudes and emotions of the participants (Fink & Kosecoff, 1998; Taylor, Peplau & Sears, 1997). Advantages of the survey method included saving time and money, the possibility of obtaining accurate results, and the fact that it affords the participants a greater sense of anonymity, privacy and control (Bailey, 1987; Dane, 1990; Mitchell & Jolley, 2007; Salkind, 1997). A further advantage is that the hazard of interviewer interference and bias is avoided as all respondents receive and complete identically worded self-report measures (Bailey, 1987).

The disadvantages of the survey method include the possibility that respondents may have misunderstood items, left out items or not completed the questionnaire in its entirety (Dane, 1990). Furthermore, Kerlinger (1996) noted that there is a propensity for faking when self-report measures and techniques are used. Another disadvantage of the survey method is that the researcher has very little control of the testing environment. The sensitive nature of the topic and the participants' need for a high level of confidentiality and privacy were important factors considered when determining the research design and method of data collection. In this respect, the researcher decided that, despite the disadvantages mentioned above, the survey method was considered to be the most appropriate method to use for the purposes of this study. The researcher provided the respondents with two telephonic contact numbers at which the researcher could be reached in order to clarify or explain any unclear or misunderstood items. The aforementioned section introduced the research design and methodology. The following sections describe the participants and sampling method used for this study.

### 6.2.2 Participants and Sampling

The sample for this study consisted of women over the age of 30 years who had been diagnosed with infertility and had undergone infertility treatment at a privately

managed health care unit in Port Elizabeth (now known as the Nelson Mandela Metropole). Sampling procedures are usually divided into the two categories of probability and non-probability sampling (Leedy, 1989). A probability sample is selected by means of an objective method and it is possible to determine each individual's chances of selection (Struwig & Stead, 2001). The non-probability sampling method, in contrast, takes less effort to ensure that the sample is an accurate representation of population (Leedy, 1989; Struwig & Stead, 2001). Non-probability sampling does not make it possible to specify the probability that any person will be included in the sample (Robson, 2002).

The participants for this study were chosen by the researcher by means of the of a non-probability purposive sampling procedure. This method was considered advantageous as it proved to be less complicated and more economical in terms of financial cost and time (Struwig & Stead, 2001). Its primary disadvantage was that it did not allow for a statistical generalisation to any population beyond the sample surveyed (Robson, 2002). In purposive methods, the chance of a member of a research population being chosen is not equal and is sometimes unknown (Walsh, 2001). The principle of selection in purposive sampling is the researcher's judgement as to typicality or interest and a sample is built up which enables the researcher to satisfy the specific needs in a project (Robson, 2002). This type of non-probability purposive sampling procedure involves the selection of cases in order to gain insight into the specific experiences that are being investigated (De Vos, 1998). The researcher is thus able to collect "information-rich cases" for in-depth study (Patton, 1990).

Bailey (1987) stated that, although general rules about the sample size are hard to make, 30 participants are considered a minimum in terms of sample size. Every effort was made to obtain a significant sample and subsequent to the necessary elimination of incomplete questionnaires and those who fell outside of the scope of the study, resulted in a final sample of 61 women who had undergone infertility treatment at a local privately managed health care unit in the Nelson Mandela Metropole. Relevant biographical data such as age, infertility diagnosis and type of infertility treatment were gathered. For the purposes of this research study, the primary criterion was that the women had received some form of infertility treatment in the past two years at the health care unit. This criterion ensured that the cases were sufficiently information-rich to gain valuable insight into the psychofortology of women undergoing infertility

treatment. Participants included in this study, irrespective of race, culture or marital status, were women above the age of 30. Sagy, Antonovsky and Adler (1990) indicated that the SOC is crystallized around the age of 30 years and for this reason, only women aged 30 and above were selected to complete the questionnaires. It was also necessary for participants to have had at least a Grade 10 level of proficiency in reading and understanding English to improve the possibility of obtaining valid responses to the questionnaires. Participants were excluded on the basis of having an age below 30 years and having had their last infertility treatment more than 2 years ago.

The following subsections of this chapter present the sample's biographical details obtained from the brief biographical questionnaire (Appendix C) administered to each participant. The biographical data serves to provide a demographic context from which valuable insight regarding the sample can be obtained.

### **6.3 Biographical Details**

The biographical variables discussed in this section were sourced from the information obtained from the biographical questionnaire completed by the 61 participants. While the small sample of 61 participants disallows the investigation of possible relationships between the biographical variables and the results of the measures (Huysamen, 1994), the biographical details nevertheless provide important insight into the demographics of the sample and a context for the results of the measures.

#### **6.3.1 Age**

The age of the participants ranged between 30 and 45 years of age with an average age of 34.52. Age below 30 years was an exclusion criterion for this study the sense of coherence construct is believed to crystallise only after the age of 30 years (Antonovsky, 1993; Sagy, Antonovsky, & Adler, 1990). Women under the age of 30 years were therefore excluded from the study. The age distribution is presented in Table 4 and all percentages were rounded off to the nearest decimal.

Table 4  
Age Distribution of the Sample

<b>Age in Years</b>	<b>Frequency</b>	<b>Percentage</b>
30-34	35	57.4%
35-39	19	31.1%
40-44	7	11.5%
<b>Total</b>	<b>61</b>	<b>100%</b>

### 6.3.2 Home Language

As presented in Table 5, 62% of the participants were English speaking while 33% of participants noted Afrikaans as their home language. Only 3% of participants for this study were Xhosa speaking and 2% (representing one participant) indicated that Dutch was her home language. The frequency distributions of the biographical data for the home language of participants are presented in Table 5

Table 5  
Frequency Table: Home Language of Participants

<b>Language</b>	<b>n</b>	<b>Percentage</b>
English	38	62%
Afrikaans	20	33%
Xhosa	2	3%
Dutch	1	2%
<b>Total</b>	<b>61</b>	<b>100%</b>

It was necessary, as the questionnaires were printed in English, for the participants to have at least a Grade 10 level of proficiency in reading in English. If English was not their primary language, it was required that the participant be able to understand the question sufficiently to provide an answer.

### 6.3.3 Employment Status and Job Description

The results presented in Table 6, indicates that 85% of the sample were employed while 15% of the sample indicated that they were unemployed. Research has shown that employment may contribute to increased levels of subjective well-being as it provides intellectual and social stimulation, social networking and provides a sense of purpose and meaning in life (Diener et al., 1999). Working outside the home may also decrease the likelihood of experiencing psychological health problems such as anxiety or depression (Mathiesen et al., 1999). The frequency distribution of the employment status of the participants of this study is presented in Table 6.

Table 6

#### Frequency Distribution: Employment Status of Participants

<b>Category</b>	<b>n</b>	<b>Percentage</b>
Employed	52	85%
Unemployed	9	15%
<b>Total</b>	<b>61</b>	<b>100%</b>

Participants were requested in the biographical questionnaire to indicate their job description if employed. The 52 participants who indicated that they were employed had a variety of occupations. These various occupations were grouped into broad categories as indicated in Table 7, which presents a frequency distribution of the 52 women who noted that they were employed. The exploratory-descriptive nature of this study does not permit the researcher to draw any conclusions between the job description of the women of the sample and their experience of infertility.

Table 7

#### Job Description of the Employed Participants in the Sample

<b>Category</b>	<b>n</b>	<b>Percentage</b>
Business/ Commercial (e.g., managerial positions, accountants, clerks, credit controllers, receptionists, property and sales	24	46.15%



representatives and book-keepers)		
Education (e.g., lecturers at tertiary institutions and teachers)	11	21.15%
Health/ Social (e.g., nursing sisters, caregivers, psychologists, pharmacists, lawyers and social workers)	14	26.92%
Self-employed (e.g., graphic designers, work-from-home employment)	3	5.77%
<b>Total</b>	<b>52</b>	<b>100%</b>

#### 6.3.4 Medical Reason for Infertility

As discussed in Chapter 2, the reasons ascribed to the diagnosis of infertility are numerous. Table 8 presents the frequency distribution of medical reason provided by the individual's medical practitioner upon diagnosis of infertility. This reason was noted on the biographical questionnaire that was completed by the participant.

Table 8

#### Frequency Distribution: Medical Reason for Infertility

<b>Medical Reason for Infertility</b>	<b>n</b>	<b>Percentage</b>
Male Factor	15	24.59%
Female Factor	23	37.70%
Combined Male & Female Factors	6	9.84%
Unknown	17	27.87%
<b>Total</b>	<b>61</b>	<b>100%</b>

As is evident from Table 8, 24.59% of the sample's infertility diagnoses were attributed to male factors while 37.70% were attributed to female factors. Combined

male and female factors, (i.e., the diagnosis is linked to a combination of male and female factors) accounted for 9.84% of the sample. A significant percentage of 27.87% of the sample indicated that there was no known medical cause that could have resulted in the diagnosis of infertility. The diagnosis of unspecified infertility is a particularly frustrating diagnosis for both couples and the medical practitioner as the best course of treatment is not always immediately clear (Cooper-Hillbert, 1998).

### 6.3.5 Psychiatric Condition

This question of whether the participant had experienced or had been diagnosed with a psychiatric condition was included in the brief biographical questionnaire in order to take cognisance of the fact that a psychological condition may in some way influence the subjective wellbeing and coping of the individuals of the sample. As the focus of the study is psychofortological, emphasis was not placed on this dimension of the participant's life. Table 9 presents the frequency distribution of the results obtained from the brief biographical questionnaire. The indication of an experience of a psychiatric condition was provided by the participant and not by the medical practitioner or health practitioner.

Table 9  
Frequency Distribution: Psychiatric Condition Experienced

Category	n	Percentage
None	50	81.97%
Depression/Mood related	7	11.48%
Anxiety	2	3.28%
Not specified	2	3.28%
<b>Total</b>	<b>61</b>	<b>100%</b>

The majority of the sample (i.e., n= 50 or 81.97%) indicated that they had not experienced a psychiatric condition in the past 2 years, while 11 participants or 18.03% of the sample indicated that they had experienced a psychiatric condition. Depression or mood related disorders were indicated as having been experienced by 11.48% of the sample, while 3.28% indicated that they had experienced an anxiety

related condition. A small percentage, 3.28% did not specify whether they had or had not experienced a psychiatric condition.

#### 6.3.5.1 Indication of the Time Period since Psychiatric Condition was experienced

The participants who had indicated that they had experienced a psychiatric condition were also asked to indicate amount of time since the condition was experienced. The frequency distribution as presented in Table 10 displays the length of time as indicated by the participants since the psychiatric condition was experienced.

Table 10

#### Frequency Distribution: Time Period Since Psychiatric Condition was experienced

<b>Time since experience of Psychiatric Condition</b>	<b>n</b>	<b>Percentage</b>
0-5months	2	18.18%
6-11months	1	9.09%
1 year-1 year 11 months	3	27.27%
2 years or more	5	45.45%
<b>Total</b>	<b>11</b>	<b>100.00%</b>

The above table indicates that 2 participants (18.18%) out of the 11 who indicated an experience of a psychiatric condition as displayed in Table 7, had experienced this condition less than 6 months prior to data collection. The majority (45.45%) indicated that they had last had the experience of a psychiatric condition more than two years ago. Due to the psychofortigenic focus of the study and the small sample size, no conclusions can be drawn from these demographics. These results are displayed to demonstrate that cognisance of the potential effect of psychiatric conditions on subjective well-being was taken.

#### 6.3.6 Method of Treatment for Infertility by means of Assisted Reproductive Technology (ART)

Women who enter the ART programmes may have struggled with infertility for a considerable amount of time. The experience of infertility treatment has been found to be extremely stressful in both a physical and emotional sense (Berg & Wilson, 1990; Cwikel, Gidron & Sheiner, 2004; Doyal, 1995). Table 11 presents the frequency distribution for the method of ART received by the participant.

Table 11

Method of Assisted Reproductive Technology (ART)

<b>Category</b>	<b>n</b>	<b>Percentage</b>
IVF	30	49.18%
GIFT	1	1.64%
IVF+GIFT	8	13.11%
Combined Male and Female Treatment	22	36.07%
<b>Total</b>	<b>61</b>	<b>100%</b>

As is evident from Table 11, the majority of the women in the sample (49.18%) have been treated for infertility by means of IVF. One individual (1.64%) was treated by means of the GIFT procedure only, while 13.11% of the sample were treated by means of both the IVF and GIFT procedure. The second highest percentage, 36.07% of the sample was treated using a combination of female related treatment, for example, hormone treatment, IVF or GIFT, and male related treatments such as hormone treatment or artificial insemination.

6.3.6.1 Length of Time for which ART was received

Participants were asked to indicate the length of time for which they had received ART on the biographical questionnaire. Prolonged fertility treatment could have a detrimental effect on subjective well-being and could lead to increased depressive symptoms amongst women who continually experience failure of treatment (Domar et al., 1992; Litt et al., 1992). It appears that women become accustomed to their status after six years and reach a level of acceptance that affords protection against depressive symptoms (Domar et al., 1992). Table 12 presents the frequency distribution of the length of time that the 61 women of this sample had received ART.

Table 12

Frequency Distribution: Length of Time for which ART was received

<b>Length of Time</b>	<b>n</b>	<b>Percentage</b>
Immediate pregnancy (once off)	9	15%
Currently	10	16%
At least six months	8	13%
At least 12 months	11	18%
More than 2 years	23	38%
<b>Total</b>	<b>61</b>	<b>100%</b>

Table 12 shows that 15% of the women had conceived after a single cycle of ART, while the majority of the sample (38%) had been receiving ART for more than 2 years. The small sample size does not allow for conclusions to be drawn from these results.

The above section presented and discussed the biographical data of the sample obtained from the biographical questionnaire. As this study has a small sample size and is exploratory-descriptive in nature, no cause and effect inferences or conclusions could be made regarding the biographical variables and their relationship to the measures. The following section provides a description and a discussion of the biographical and standardised measures used in this study.

#### **6.4 Research Measures**

Data were collected using a biographical questionnaire and standardised paper and pencil measures that invited the participant to self-report on their thoughts, feelings and actions. Taylor, Peplau and Sears (1997) noted that an advantage of self-report measures is that it provides the researcher with a measurement of subjective states, attitudes and emotions. As cautioned in literature (De Vos, 1998; Taylor, Peplau & Sears, 1997) the researcher was aware that the use of self-report questionnaires lends itself to the possibility of faking.

The advantage of using a standardised measure in research allows for objective assessment, comparable results, and yields data that can be statistically analysed (Elkonin, Foxcroft, Roodt & Astbury, 2001). Disadvantages of using standardised measures are related to the design of the measure and its suitability of measurement in

a culture different for which it had been originally standardised (Elkonin, et al., 2001). Each of the measures used in this study are briefly discussed below.

#### 6.4.1 Biographical Questionnaire

A brief, non-standardised biographical questionnaire (Appendix C) was constructed by the researcher to obtain demographic information about the participants. This information was used to provide a more meaningful interpretation of the results. The questionnaire consisted of closed-ended questions and included variables such as age, marital status, employment status, and the time period during which the participant had been treated at a privately managed health care unit. The incidence of a psychiatric condition could influence the manner in which questionnaires were answered, therefore, participants were requested to indicate the presence of a previous or current episode of a psychiatric condition as well as to specify the type of psychiatric condition, for example, a major depressive episode or an anxiety disorder. Participants were not excluded from the study on the basis of indicating the experience of a psychiatric condition or episode. As discussed in Chapter 2, women who are experiencing infertility or undergoing infertility treatment, may experience depression and anxiety as a result of the uncertainty and stress associated with the diagnosis and treatment of infertility (Domar, et al., 1985; Dunkel-Schetter & Lobel, 1991).

#### 6.4.2 The Coping Resources Inventory (CRI)

The Coping Resources Inventory (CRI) was constructed by Hammer and Marting (1988) with the aim of identifying resources currently available to the individual for managing the effects of stress. A primary emphasis of the inventory is on the resources rather than deficits and the manner in which the individual is dealing with subjective feelings of stress. According to Hammer and Marting (1988), an individual's self-esteem can be enhanced by identifying and acknowledging competencies and resources as well as their deficits and impairments. The questionnaire consists of 60 items 'tapping' resources in five domains. The participant is asked to use a four point rating scale (never or rarely; sometimes, often and almost or almost always) to indicate how often they have engaged in the particular item in the past 6 months. The test is hand scored using a template. According to Hammer

and Marting (1988), the estimated time to complete the inventory is approximately 10 minutes. The five domains are:

1. Cognitive (COG): This domain measures the extent to which individuals maintain a sense of self-worth, a positive outlook towards others and a general optimism about life. An example of the items in this domain is, “I feel as worthwhile as anyone else”.
2. Social (SOC): The items in this domain assess the degree to which individuals are surrounded by, and embedded in, social networks that are able to provide support in times of stress. Examples of items in this domain are, “I enjoy being with people”.
3. Emotional (EMO): This domain measures the degree to which individuals are able to accept and express a range of affect. The ability to express a range of affect is believed to be important in softening the long term effects of stress. Items in this domain include “ I am happy” and “I can cry when I am sad”.
4. Spiritual/ Philosophical: (SPI/PHI): Items in this domain are intent of measuring the degree to which actions and individuals are guided by stable and consistent values derived from religious, familial, cultural tradition or from personal philosophy. These discourses may be instrumental in allowing the individual to frame life-events in a certain way. Examples of the items in this domain include “I pray or meditate” and “I can make sense out of my world”.
5. Physical (PHY): This domain measures the extent to which individuals enact health promoting behaviours believed to contribute significantly to increased physical well-being. Examples of items in this domain are “I do stretching exercises” and “ I eat junk food”.

Respondents are asked to indicate how often they have engaged in the behaviour described in the item over the past six months by using a 4-point scale that provides the option to answer: never, sometimes, often or always. The questionnaire is scored using a 4-point Likkert scale system where the sum of the item responses for each scale constitutes the scaled scores. The CRI may be scored by hand with the use of a standardised test template provided by the test developers. The number of items on each scale differs and it is not possible to make direct inter-scale comparisons based on the raw scores. The raw scores, therefore, need to be converted to standard scores that have a mean of 50 and a standard deviation of 10 scaled points. The total resource

score is then calculated by adding the five individual scale scores. The higher the scale score, the higher the perceived resources (Hammer & Marting, 1988). The conversion of raw scores to standard scores is done by using tables provided in the CRI manual. Due to gender differences in coping resources, separate conversion tables are provided for men and women (Hammer & Marting, 1988). Hammer and Marting (1988) stated that approximately 95 percent of people are expected to have a standard score between 30 and 70 points.

The validity and reliability of the CRI has been investigated on a variety of subjects. With regards to validity, the CRI has been found to have scale intercorrelations, as well as predictive, convergent, divergent, discriminant and concurrent validity. In terms of the reliability of the CRI, it was found that: (a) the measure achieved fair homogeneity of item content per scale, (b) in terms of the internal consistency (as measured by Cronbach's alpha at 0.93), the CRI scales reliably tap the constructs, and (c) test-retest reliability, investigated over a six week period indicate that the CRI scores are relatively stable over time (Hammer & Marting, 1988). Although this measure was developed in the United States of America and was not normed for a South African sample, a number of studies have been conducted at the Nelson Mandela Metropolitan University or the former University of Port Elizabeth (e.g., Brown, 2002; Cairns, 2001; Ferreira, 2007; Hatuell, 2004; Madhoo, 1999; Otto; 2002; Smith 2006).

#### 6.4.3 The Orientation to Life Questionnaire (SOC-29)

Antonovsky (1987) developed the 29-item English version of the SOC scale. It is constructed around the formal definition of the Sense of Coherence and the three implied components of comprehensibility, manageability, and meaningfulness. Respondents are asked to rate each of the statements on a seven-point Likert scale that has two anchoring phrases at each end of the scale. For example, in response to an item presented as an incomplete statement "When you do something that gives you a good feeling..." the participant may choose between the range of 1 (it's certain that you'll go on feeling good) to 7 (it's certain that something will happen to spoil the feeling). Scores range from 29 to 203, with a higher score indicative of a stronger SOC and by implication, a more successful ability of coping. Thirteen of the items on the scale are negatively formulated and are therefore reverse scored (Antonovsky, 1993).



Although there are 11 items pertaining to the component of comprehensibility, 10 to manageability and eight items to meaningfulness, Antonovsky (1993) cautioned that the SOC scale was constructed to measure the global orientation and should not particularly be used to assess these individual components. Various studies have supported the SOC scale as a one-dimensional instrument with a single global factor that measures SOC (Frenz, Carey & Jorgensen, 1993; Holm, Ehde, Lamberty, Dix & Thompson, 1988). Frenz, Carey and Jorgensen (1993) found the SOC- 29 to have a high level of internal consistency with the Cronbach alpha at 0.93. There is also considerable evidence that confirms content validity and face validity, with further indications of good construct validity and criterion validity (Antonovsky, 1993). The SOC construct has also been found to have consistently high correlations with trait anxiety, hardiness and a variety of well-being and health measures.

Antonovsky (1993) stated that the SOC construct is universal, crossing boundaries of gender, social class and culture. The questionnaire has been used in a variety of different countries and has been found to be reliable and valid in many studies. Antonovsky (1993) noted that the measure has been used in 14 different languages. South African researchers, Wissing and Van Eeden (1997), investigated the validity and cross-cultural applicability of the SOC-29 for South Africa and found it to have an adequate validity and also confirmed the universal applicability and validity of the construct across gender, age and culture.

The measure has been used successfully in research conducted at the University of Port Elizabeth, now known as the Nelson Mandela Metropolitan University (Brown, 2000; Cairns, 2001; Ferreira, 2007; Katalan, 2003; Kirsten, 2003; Madhoo, 1999; Smith, 2006).

#### 6.4.4 The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale, (Diener, Emmons, Larsen & Griffin, 1985), is a five item scale that provides a measurement of global life satisfaction where global satisfaction refers to a cognitive, judgemental process in which the individual assesses the quality of life based on the individual's own, unique set of criteria (Diener et al., 1985; Pavot & Diener, 1993). The premise of the SWLS is that the respondent is in a unique and privileged position to report subjectively on their personal experience of well-being (Hatuell, 2004).

The measure, which takes approximately two minutes to complete, assesses the individual's judgement of personal global life satisfaction by means of a five-item scale (Pavot & Diener, 1993). Participants are asked to use a seven-point Likkert scale, ranging from 1- strongly disagree to 7- strongly agree, to indicate a general sense of life satisfaction. Each of the items is scored from 1 to 7, implying a possible range of total scores from 5 (extremely dissatisfied with life) to 35 (extremely satisfied with life). Scores on the SWLS can be interpreted as absolute or in terms of relative life satisfaction (Pavot & Diener, 1993). Table 13 presents the range of scores and corresponding categories of the SWLS as described by Pavot and Diener (1993).

Table 13

Range of Scores and Categories of the SWLS

Range of Score	Category
5-9	Extremely dissatisfied
10-14	Dissatisfied
15-19	Slightly dissatisfied
20	Neutral point (equally dissatisfied and satisfied with life)
21-25	Slightly satisfied
26-30	Satisfied
31-35	Extremely satisfied

The brief format and the speed with which it may be completed is an advantage of this scale and it may easily be incorporated into an assessment battery with minimal cost and time expenditure (Hatuell, 2004).

The SWLS has been shown to be a valid and reliable measure of life satisfaction (Diener, et al. 1985; Pavot & Diener, 1993) and it has been used in studies conducted in South Africa (Wissing & Van Eeden, 1997) where it was shown that the standard deviations and mean scores were similar to those found by Pavot and Diener (1993). Pavot and Diener (1993) had established the mean score of the SWLS to be 23.5, with a standard deviation of 6.43. It has been found that commonly researched groups, such as adult populations and the elderly, fell in the range of scores between 23 and 28 (Pavot & Diener, 1993). In terms of its reliability, Diener et al. (1985) reported a two-month test-retest reliability coefficient of 0.82 and an alpha-reliability coefficient

of 0.87, while Pavot and Diener (1993) supported the established psychometric qualities of the scale. In a research study conducted at the University of Port Elizabeth (now the Nelson Mandela Metropolitan University), Hatuell (2004) investigated the satisfaction with life of overweight adults and obtained a mean score of 24.66 with a standard deviation of 6.59. Other studies conducted at the Nelson Mandela Metropolitan university or the former University of Port Elizabeth (e.g., Ferreira, 2007; Gal, 2004; Odendaal, 1999; Vorster, 2002; Smith, 2006) have had similar standard deviation and mean scores as those found by Pavot and Diener (1993).

The SWLS can be considered to be an assessment tool that focuses on the positive aspects of the respondent's experiences rather than placing emphasis on negative emotion. It has also been shown to be a valuable instrument to measure the change or fluctuations in subjective well-being for the purposes of intervention and measuring therapeutic outcomes (Pavot & Diener, 1993). The SWLS does not claim to measure all aspects of subjective well-being, but is rather intended to assess the cognitive rather than affective component of the construct (Pavot & Diener, 1993). The following section focuses on the Affectometer-2, the second measure of subjective well-being used for the purposes of this study.

#### 6.4.5 The Affectometer-2 Scale (AFM-2)

The Affectometer-2 Scale (AFM-2) is a 40-item scale that was designed to measure general happiness or sense of well-being by determining the balance of positive and negative feelings in recent experience (Kammann & Flett, 1983). It is a measure of quality of life experienced on an affective or emotional level while the overall level of well-being is conceptualised as the extent to which positive feelings predominate over negative feelings (Kammann & Flett, 1983).

The instructions request that the subjects report their feelings "over the past few weeks". This 'time frame' reflects a compromise between measuring the sense of well-being in its most global meaning and a time period suitable to a reasonable measure of accurate recall (Kammann & Flett, 1983). Respondents are invited to provide a response concerning how often the feeling was experienced, as graded on a 5-point Likert scale that ranges from 'not at all' to 'all the time'. The AFM-2 measure Positive Affect (PA), Negative Affect (NA) and Positive- Negative Affect balance (PA-NA) (Wissing & Van Eeden, 1997).

The 40 items are subdivided into 2 subscales with 20 items in each subscale and includes 10 positive and 10 negative items each. Positive and negative items are represented alternately in order to reduce the possibility of the negative effect of response styles (Kammann & Flett, 1983). The 40 items for this scale were empirically selected from a pool of 435 possible adjectives and sentences. The items can be grouped into the following 10 categories: (a) confluence, (b) optimism, (c) self-esteem, (d) self-efficacy, (e) social support, (f) social interest, (g) freedom, (h) energy, (i) cheerfulness, and (j) thought clarity (Kammann & Flett, 1983). From each of these 'characteristics of happiness', four items were identified with one derived from each of the following groupings:

1. Positive sentences (e.g., I feel loved and trusted; My life is on the right track).
2. Negative sentences (e.g., I feel there must be something wrong with me, My thoughts go round in useless circles).
3. Positive Adjectives (e.g., Satisfied, Optimism).
4. Negative Adjectives (e.g., Confused, Depressed).

Possible scores on the AFM-2 range from 0 to 80 with a score of 40 representing a neutral point in the scale. Higher scores indicate positive subjective well-being while conversely; lower scores indicate more negative subjective well-being.

Kammann and Flett (1983) reported a Cronbach alpha co-efficient of 0.95 for the AFM-2 and research has supported the validity of the scale. The AFM2 has been used internationally and several South African researchers (Ferreira, 2007; Gal, 2004; Odendaal, 1999; Smith, 2006; Vorster, 2002; Wissing & Van Eeden, 1997) have also used the measure successfully.

The above subsections gave a brief description of the measures used for this study. In the following section a description of the procedure and process used for the study is given.

## **6.5 Procedure**

A meeting was held with the research co-ordinator at the privately managed health care unit from which the researcher obtained the sample. This meeting was held to assess the viability of the study, the possibility of obtaining a sample of more than 30 participants, and to gain a greater understanding of how this study could be of benefit to their unit. Once the research co-ordinator at the health care unit provided the

necessary approval, the proposal was forwarded to the Advanced Degrees Committee (ADC) at the Nelson Mandela Metropolitan University (NMMU) for their approval. Thereafter it was sent to the Human Ethics Committee at the NMMU for approval to proceed. The research co-ordinator at the private managed health care unit was then contacted in order to provide further information regarding the approved study. The ethical parameters and confidentiality of medical records containing details of possible participants provided a challenge for the researcher. It was decided that the research co-ordinator of the health care unit would contact the possible participants to obtain their permission for the release of their names and contact telephone numbers to the researcher. Once this permission was obtained, the researcher contacted the interested participants, provided information of the nature, purpose and procedure of the study and arranged a suitable time for the administration of the questionnaires. Each participant was provided with an envelope containing the following: an information letter (Appendix A) concerning the nature, purpose and procedure of the study, a voluntary consent form (Appendix B), a brief biographical questionnaire (Appendix C), the Coping Resource Inventory (CRI), the Orientation to Life (SOC-29) questionnaire, the Satisfaction with Life Scale (SWLS) and the Affectometer-2 (AFM-2) scale. A clear description of how to complete the questionnaire was provided with each questionnaire. Once the questionnaires were completed, participants returned them to the researcher or the research co-ordinator at the health care unit in sealed envelopes to ensure confidentiality. Although participants were not required to provide their names for the purposes of the research, they were required to complete a detailed consent form. Names and contact details were then only required from those participants who requested feedback regarding their personal results from the scored questionnaires.

The questionnaires were scored and re-scored by the researcher to eliminate the possibility of error. The data were analysed by a statistician who audited the data to enhance the accuracy of the results. Individual feedback was provided on request, and a summary report was made available to the research co-ordinator at the health care unit.

## **6.6 Data Analysis**

The data were analysed according to the three aims of the study. The researcher employed the services of an expert statistician to provide an analysis of the data

obtained during this study. Descriptive statistics were used to investigate the mean, ranges and standard deviations of the measures. These descriptive statistics served to elucidate the first two aims of the study, the first aim being to explore and describe the coping of women currently undergoing infertility treatment at a managed health care unit, and the second aim being to explore and describe the subjective well being of women currently undergoing infertility treatment at a managed health care unit. The mean is a measurement of central tendency and is the average calculated by adding up all the scores and dividing this number by the number of scores (Mitchell & Jolley, 2007). The standard deviation is a measure of variability that measures the average deviation of scores from the mean (Cozby; 1993; Struwig & Stead, 2001). The more that scores vary from each other, the larger the standard deviation, whereas if all the scores were identical to the mean, the standard deviation would be zero (Mitchell & Jolley, 2007). Cronbach alpha's were calculated for the four standardised measures used for the purposes of this study. The Cronbach alpha coefficient is an internal consistency index designed for use in measures that have no right or wrong answers (Mason & Bramble, 1989). According to Mason and Bramble (1989), the interpretation of the Cronbach alpha coefficient is the same as other internal consistency reliability coefficients (i.e., between 0.0 and 1.0, with a higher reliability approaching closer to 1.0).

The third aim of exploring and describing the patterns of coping resources, sense of coherence, satisfaction with life, and happiness of women undergoing infertility treatment at a managed health care unit was analysed using an exploratory-descriptive multivariate cluster analysis procedure to identify any possible patterns between the constructs. Cluster analysis is defined as a group of multivariate techniques whose primary aim is to group objects based on their similarities across several measures, so that cases within each group are more similar to each other than to other groups (Donnelly, 2007). A technique, known as the *k*-means clustering technique, was conducted to determine the number of clusters. Three clusters were identified and a single factor ANOVA was conducted to draw inferences about differences between the means of the clusters across the three dimensions of subjective well-being. An ANOVA is an analysis of variance where the groups are defined according to only one independent variable (Harris, 1998) Once it was ascertained that there were significant statistical differences between the means of the clusters, it was necessary to determine the extent of these differences. A post-hoc analysis using Scheffé tests

were used to determine how each cluster differed on each of the measurements from the other groups. The Scheffé test is a relatively conservative multiple comparison procedure that is easy to use and maintains stringent control (Howell, 1989). This test makes use of an F ratio to test for a significant difference between any two treatment conditions (Gravetter & Wallan, 2004). Thereafter, Cohen's d statistics were used to determine the practical significance of the differences between cluster means on each of the measures.

### **6.7 Ethical Considerations**

Grieve (2001), warned that all behavioural assessments allow for the possibility of invasion of privacy and remarked that there is a level of accountability for the way in which assessment measures are used, administered, interpreted and the manner in which results are obtained are provided to the client. De Vos (2000) cautioned researchers to take reasonable steps to avoid causing harm to their participants during a research study. To this end, ethical guidelines provide standards upon which the researcher should evaluate their personal and professional conduct (Smith, 2006; Vorster, 2002). Special care should be taken in the field of social science where the participation of human beings brings its unique array of ethical considerations (De Vos, 2000). A number of guidelines were followed for the duration of this study in order to protect the participants and to maintain the validity of the study. The research proposal for this study was submitted to and accepted by the Advanced Degrees Committee of the Faculty of Health Sciences and the Human Ethics Committee at the Nelson Mandela Metropolitan University (NMMU). After permission had been obtained from the research co-ordinator at the privately managed health care unit from which the participants were sampled, the researcher respected the confidentiality of the participant's medical records at the unit and liaised with the research co-ordinator at the Unit to obtain permission to contact them. Participants were informed, by means of an information letter, of the purpose and procedure of the study as well as of their right, as a voluntary participant, to withdraw themselves from the study at any time.

Confidentiality was maintained at all times and participants were provided with the researcher's contact numbers should they have experienced any concern regarding their participation in the study. As it was not ethically possible for the researcher to provide counselling for the participants, they were advised of their own responsibility

to seek counselling or psychological help should their participation in the study or the information provided in the report have caused them considerable distress.

## **6.8 Conclusion**

The research design and methodology as discussed in this chapter was chosen on the basis of the aims and purposes of the study. The research design was exploratory descriptive and a non-probability, purposive sampling was used to obtain a sample of 61 women undergoing infertility treatment at a privately managed health care unit. The data for the study were gathered using a brief biographical questionnaire, the CRI and SOC-29 as measures of coping and the SWLS and AFM-2 as measurements of subjective well-being. The data were statistically analysed by an expert statistician and descriptive statistics served to describe the mean and standard deviation of the results obtained from the questionnaires completed by the participants. The statistical procedure of a cluster analysis was used to explore and describe patterns of coping and subjective well being of the sample. A discussion of the results obtained from the statistical procedures is presented in the following chapter.



## **Chapter 7**

### **Results and Discussion**

#### **7.0 Introduction**

The results presented in this chapter are an exploration and description of the psychofortology (i.e., coping and subjective well-being) of a sample of 61 women who, at the time of data collection, were receiving infertility treatment at a privately managed health care facility. The first aim of this study was to explore and describe the coping of women undergoing infertility treatment. For the purposes of this study, the concept of coping was subdivided into an exploration and description of: (a) the coping resources of the women undergoing infertility treatment, and (b) the sense of coherence of the women undergoing infertility treatment. The measures used to gather data for the exploration of this aim was the Coping Resources Inventory (CRI) and the Sense of Coherence Scale (SOC-29) respectively.

The second aim of the study was to explore and describe the subjective well-being of women undergoing infertility treatment. The concept of subjective well-being, for the purposes of this study, was subdivided to facilitate the exploration and description of: (a) the satisfaction with life of women undergoing infertility treatment, and (b) the levels of happiness of women undergoing infertility treatment. The Satisfaction with Life Scale (SWLS) and the Affectometer-2 (AFM-2) respectively were the measures used to provide data for the exploration of this aim.

The third aim of this study was to investigate the patterns between the respondent's scores on the CRI, SOC-29, SWLS and AFM-2. The results obtained from the cluster analysis used to explore this aim is presented and discussed in this chapter.

The results of the four measures (i.e., the CRI, SOC-29, SWLS and AFM-2) are presented and discussed in accordance with the first two aims. Finally, the third aim is realised by the presentation and discussion of the patterns of coping and subjective well-being obtained by means of cluster analysis. All percentages were rounded off to the nearest decimal.

#### **7.1 Results of the Measures**

The results of the measures pertaining to the first and second aims of the study will be addressed in this section. The first two aims of the study are to explore and

describe the coping and subjective well-being, respectively, of a sample of 61 women who have undergone infertility treatment at a privately managed health care facility.

### **7.1.1 Coping**

The construct of coping was, for the purposes of this study, conceptualised in two ways: (a) coping resources, and (b) the sense of coherence. The Coping Resources Inventory (CRI) was used to measure the participants' coping resources while the 29 item Sense of Coherence scale (SOC-29) was used to measure the sense of coherence of the participants of the sample. The results from these measures are provided in the following subsections.

#### **7.1.1.1 Coping Resources**

Hammer and Marting's (1988) research defined coping resources as "those resources inherent in individuals that enable them to handle stressors more effectively, to experience fewer or less intense symptoms upon exposure to a stressor or to recover faster from exposure" (p.2). Individuals with few coping resources are considered to be constitutionally vulnerable and fragile while those with a higher level or a greater number of coping resources have been classified as being resilient (Kessler & Essex, 1982). Coping resources play a vital role in the paradigm of positive psychology and wellness by identifying and acknowledging individual competencies and resources (Hammer & Marting, 1988). Some resources are effective in helping individuals deal with stressors, while others may be important in preventing demands become stressors (Matheny, Aycock, Pugh, Curlette & Canella, 1986). Hobfall (2001) considered coping resources to be a means of mediating the stress response and believed it to have a role in the promotion of wellness.

Hammer and Marting's (1988) Coping Resource Inventory (CRI) examines the resource end of the demand-resource imbalance (Matheny, Aycock, Curlette, & Junker, 1993). Each of the five subscales of the CRI measures five different areas of coping resources but since each of these subscales have a differing number of items, it was not possible to make direct raw score based comparisons between the various subscales. In order to provide the possibility of a comparison between the five subscales, the raw scores were converted to standard scores with a mean of 50 and a standard deviation of 10 points. Table 14 provides the means and standard deviations obtained on the CRI for both the standard subscale scores and total standard scores.

The maximum and minimum standard score obtained by the sample of 61 participants is also indicated in Table 14.

Table 14  
Means and Standard Deviations of the Coping Resources Inventory (CRI)

Variable	n	Mean	Minimum	Maximum	Standard Deviation	Cronbach's alpha
Cognitive Standard Score	61	48.54	27.00	68.00	10.20	0.82
Social Standard Score	61	48.44	23.00	68.00	10.29	0.78
Emotional Standard Score	61	48.69	30.00	72.00	11.02	0.87
Spiritual/ Philosophical Standard Score	61	50.08	27.00	69.00	9.32	0.80
Physical Standard Score	61	46.59	29.00	71.00	8.76	0.68
Total	61	48.05	27.00	75.00	10.32	0.81

According to the research conducted by Hammer and Marting (1988), a mean value of 50 would be indicative of an average level of coping resources and approximately 95% of individuals will have a score ranging from 30 and 70. Scores below 30, therefore, are considered to be below average while scores above 70 are classified as above average. The total mean of the sample used for this study is 48.05, although slightly below the mean of 50, implies that the current sample still perceived themselves as having a relatively average level of coping resources. Ferreira (2007), in a study that explored the psychofortology of 31 males and 31 females undergoing infertility treatment, found that the women of that sample obtained a total mean score of 48.16 on the CRI. Antonovsky (1984) noted that well managed tension may diminish the effect of the stressor, causing it to become neutral or having a positive effect by developing, enhancing and rallying coping resources and responses. The relatively average level of coping resources as displayed by the current sample,

suggests that many of the participants have the capacity to perceive the stressors associated with the diagnosis and treatment of infertility from a positive perspective (Leiblum, 1997a). This capacity allows for the mobilisation of effective coping resources in times of perceived stress (Rice, 1992).

The mean scores of four of the five subscales, namely the cognitive, social, emotional and spiritual/philosophical subscales, were clustered closely around the mean of 50, but with a physical standard mean score of 46.59 and standard deviation of 8.76. The physical resources subscale scored the lowest and fell slightly below the mean. The physical domain provides an indication of the degree to which individuals enact health promoting behaviours that are believed to enhance physical well-being and health. Although the mean of this domain was the lowest of all the subscales, standard scores ranged from a minimum of 29 to a maximum of 71, suggesting that some participants may be incorporating and receiving benefit from aspects of physical coping resources. Ferreira (2005) commented that the experience of infertility creates a heightened awareness of the physical body, its functioning and lack of functioning. The slightly below average score on the physical scale could suggest that some participants of the sample do not perceive the physical coping resources as being reliable or do not engage in health enhancing physical activities for fear of disrupting their treatment.

The spiritual/philosophical subscale, with a mean score of 50.08 and standard deviation of 9.32, had the highest mean of the five subscales. This domain measures the degree to which the actions of individuals are guided by stable and consistent values from religion, tradition or personal philosophy (Hammer & Marting, 1988). The high mean suggests that spirituality or having a philosophy within in which to frame an experience is marginally the preferred coping resource for this sample of women. Religion and a sense of spirituality has been linked to coping responses and acts as framework or filter through which events and life experiences are placed in perspective (Bourjolly, 1998). As previously discussed in Chapter 5 of the present study, Compton (2005) and Myers (1992; 2000) found that having a sense of meaning or purpose in life is an important indicator of subjective well-being. These studies have noted that people who report greater religious faith and attend places of worship regularly have a greater sense of well-being. This study conceptualised the coping resources together with the sense of coherence as subconstructs of coping within the

framework of psychofortology. The following section explores the results obtained from the questionnaire that measured the sense of coherence for the current sample.

#### 7.1.1.2 The Sense of Coherence

The means and standard deviations procured from the Antonovsky's Sense of Coherence Questionnaire (SOC-29), also referred to as the Orientation to Life Questionnaire, are presented below in Table 15. This questionnaire was developed by Antonovsky (1987) and assesses the theoretical concept of the sense of coherence as a global life orientation.

Table 15

#### Means and Standard Deviations of the Orientation to Life Questionnaire (SOC-29)

<b>Variable</b>	<b>n</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Cronbach alpha</b>
SOC Total	61	135.21	26.14	66	184	0.92

Chapter 4 provided a discussion of Antonovsky's (1987) theory of the sense of coherence construct, which, in broad terms, was defined as a global, dispositional orientation that develops over the life span of the individual and crystallises in early adulthood. Sense of coherence is a personal resource that promotes better coping responses and helps to diminish the effects of stress (Anson, Carmel, Levenson, Bonne & Moaz, 1993). It is an affective and cognitive process that facilitates the individual's perception of an event or experience as having meaning, being understandable, and as being a situation that can be faced with perceived available resources (Post-White et al., 1996). A person with a strong sense of coherence is more likely to choose the most effective resources and coping strategies available and will face the stressor, while the person with a weak sense of coherence is more likely to focus on, and experience an overwhelming emotional response (Antonovsky, 1987). The ability of the person with the high sense of coherence to employ a resource or a variety of resources to confront a stressor is a strength that helps to reduce tension created by the stressor and improves the individual's quality of life (Cairns, 2001).

Table 15 presents the mean SOC score for the current sample of 61 women who were undergoing infertility treatment at a managed health care facility and provides a measure of information about the coping abilities of these women. Although Antonovsky (1987) did not specifically provide any standard scores or means for the

SOC-29, a number of published studies have been conducted on a variety of samples and the findings of these studies may be used as comparative data (Antonovsky, 1993). Research conducted by Ferriera (2007), which investigated the psychofortology of males and females undergoing infertility treatment, obtained a SOC score of 134.52 for the 31 females in the sample. This score, although obtained from a smaller sample than the 61 women used for the current study, is very similar to the average mean SOC score obtained for this study. A study conducted by Wissing and Van Eeden (1997) exploring the psychological wellbeing of a sample of 550 multicultural male and female South Africans, yielded a SOC mean of 136.52 with a standard deviation of 21.68. The study did not place emphasis on a particular life stressor and the sample consisted mainly of psychology students and the average lay person. The majority of the sample fell into the 18- 35 year old age group. It is important to consider that the present sample of 61 women who were undergoing treatment for infertility is much smaller than that of Wissing and Van Eeden's sample and that the individuals of the sample for the current study were, at the time of data collection, experiencing the major life stressor of infertility. It is for these reasons that only a cautious comparison be made between the results obtained from the present study and that of Wissing and Van Eeden. The statistics in this study will be compared to these norms since there are no specific norms for the SOC for South African women experiencing infertility or treatment for infertility.

The mean obtained for the current sample is 135.21 with a standard deviation of 26.14. This mean is only slightly lower than the mean of the sample used for Wissing and Van Eeden's study, which implies that the present sample has a relatively average sense of coherence. The Cronbach alpha coefficient is 0.92, which confirmed the reliability of the findings. The minimum total score obtained for this sample was 66 while the highest score was 184. The vast difference in scores suggests that, while the majority of the sample has an average sense of coherence, there are those in the sample with an above average sense of coherence and those with a well below average sense of coherence. While no definite conclusions may be drawn from these results, a possible reason for the large range in scores could be that some women (perhaps those who have been recently diagnosed, those who have had numerous unsuccessful infertility treatments or those who have just started infertility treatment) perceive the situation as being beyond their control and without meaning. The diagnosis of infertility could also result in an existential crisis as the woman

reconsiders and re-evaluates the ideological constructs of motherhood and womanhood (Doyal, 1995; Helman; 2001). Antonovsky (1987) noted that the SOC is influenced by existential issues such as failure and fear of death. Thus, some women in the current sample may perceive themselves as being defective or a failure in terms of conception and giving birth. These perceptions may, in turn, lead to a low SOC. However, the results also suggest that some participants may have conceptualised and perceived the diagnosis of infertility and the process of treatment as something manageable and an experience from which they may derive meaning.

A number of studies, as referred to in Chapter 4 have indicated that individuals with a high sense of coherence proclaim a better level of physical and mental health and are more capable of effectively dealing with life stressors. The results of the current study then imply that the majority of the respondents are able to cope at an average level with life stressors and experiences. According to Antonovsky (1987), a strong SOC is cultivated by life experiences and facilitate the development and enhancement of generalised resistance resources (GRR's).

Cairns (2001), in a South African study concerning the coping resources and sense of coherence of cancer patients, posed the question whether the level of sense of coherence may have changed in response to a major life event such as, in that study's case, cancer. Cairns found that the mean for the SOC of the 34 cancer patients used as a sample for the study was relatively high at 151.71. In another South African study conducted by Madhoo (1999), a sample of 35 patients in cardiac rehabilitation obtained a relatively high mean of 159 for the SOC. In both these studies, the individuals were faced with a chronic condition that was considered as a stressful experience. In a study conducted by Viney (1986) in which the emotions of people who were hospitalised with a severe chronic illness, it was found that the hospitalised patients reported significantly higher levels of positive emotion than the non-patient comparison group. The implication of these findings may be that an individual's sense of coherence may be strengthened by the experience of a significant, life-changing event or medical diagnosis. With reference to the present study, it appears that, while not true for all individuals, the majority of the sample of women experiencing infertility treatment have a relatively average ability to cope with the stressful life event of infertility.

The ability of an individual to find a sense of meaning and purpose in the midst of a stressful situation or circumstance appears to be the most important factor in

determining whether the experience of a stressful life event can produce a positive outcome (Taylor et al., 2000). The component of meaningfulness in the construct of the SOC has been found to be the most important part of the SOC, without which the neither comprehensibility nor manageability will persevere (Strang & Strang, 2001). Meaningfulness and the coping resource of spirituality has been found to be linked in a number of research studies (Ferraro & Kelley-Moore, 2000; Jenkins & Pargament, 1995; Johnson & Spilka, 1991). In the current study, it was found that the sample of 61 women who were undergoing infertility treatment scored highest on the coping resources scale of spirituality. It could be suggested therefore, that despite the vast range of scores on the SOC and the relatively average mean score, the majority of the sample perceived the diagnosis of infertility as being comprehensible, manageable and meaningful. This was possibly achieved by the capacity of the women of the sample to adopt a spiritual framework or personal philosophy within which they could contextualise and derive meaning from the experience of infertility.

The above section presented and discussed the results obtained for the construct of coping. The results of the CRI, which measured the coping resources of the sample and the SOC-29, which measured the sense of coherence of the sample were described.

## **7.2 Subjective Well-being**

This section addresses the second aim of the study, which was, to explore and describe the subjective well-being of women undergoing infertility treatment. For the purposes of this study, the concept of subjective well-being was subdivided to facilitate the exploration and description of: (a) the satisfaction with life of women undergoing infertility treatment, and (b) the levels of happiness of women undergoing infertility treatment. As discussed in Chapter 5, the construct of subjective well-being can be defined and explored on a cognitive and emotional level. For the objective of this study, subjective well-being was conceptualised on both the cognitive level, by measuring the global sense of satisfaction with life, and on the emotional level, by measuring the level of positive and negative affect. Researchers in the field of subjective well-being have advocated that the major components of subjective well-being be considered and explored separately in research so as to build up a broader picture of the construct of subjective well-being (Diener et al., 1999; Pavot & Diener, 1993). In the present study, the satisfaction with life of the sample was measured by



the SWLS, while the levels of happiness, that is, the existence of positive affect and the relative absence of negative affect, was measured by the AFM-2. The following subsections outline the results of the sample on these two measures.

### 7.2.1 The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) provides a measurement of global life satisfaction, a concept which refers to the cognitive, judgemental process in which individuals assess the quality of their own lives based on their own personal, unique set of criteria (Diener et al., 1985; Pavot & Diener, 1993; Veenhoven, 1991). Compton (2005) commented that satisfaction with life addresses an all-encompassing judgement about the acceptability of the person's life. This thought echoes that of Michalos (1985) who stated that the judgemental aspect of satisfaction with life involves the constant comparisons of the individual's perception of what they have with what they expect or think they deserve. Judgements are made upon a comparison of individual circumstances with what is thought to be an appropriate personal standard versus criteria deemed important by an external source. If there is a small discrepancy in this social comparison, the person may feel satisfied but if there is a large discrepancy, the person may feel dissatisfied with life (Diener et al., 1985). The concept of life satisfaction also refers to the individual's total estimate of quality of life in several areas of their life (e.g., family life, housing, income, health, social security and working life) (Strack et al., 1991). The process of answering the questions concerning satisfaction with life are more cognitive in nature and research has shown that the construct of satisfaction with life can be distinguished from the emotional aspects of positive and negative affect (Lucas, Diener & Suh, 1996). The categories of the satisfaction with life of the respondents of the sample for the present study are presented in Table 16.

Table 16  
Frequency Distribution and Levels of Satisfaction with Life

<b>Category of Satisfaction with Life</b>	<b>Range</b>	<b>Frequency</b>	<b>Percentage</b>
Extremely dissatisfied	5-9	0	0%
Dissatisfied	10-14	4	7%
Slightly dissatisfied	15-19	7	11%
Neutral point (equally dissatisfied and satisfied with life)	20	0	0%
Slightly satisfied	21-25	21	34%
Satisfied	26-30	19	31%
Extremely satisfied	31-35	10	16%
<b>Total</b>		<b>61</b>	<b>100%</b>

As reported in Table 16, the majority of the sample (81%) of the participants indicated that their levels of satisfaction with life ranged from slightly satisfied to extremely satisfied. More specifically, 34% of the sample described themselves as being slightly satisfied with life, 31% indicated that they were satisfied with life and 16% described themselves as being extremely satisfied with life. Most of the participants (65%) were slightly satisfied or satisfied with their lives. These findings are supported by research findings from an international study conducted by Pavot and Diener (1993), which found that most groups fell into the range of 23 to 28 points on the SWLS represented by the slightly satisfied to satisfied categories on the scale. Descriptive statistics relating to the SWLS scores of the current sample are presented in Table 17.

Table 17  
Mean and Standard Deviations of the Satisfaction with Life Scale (SWLS)

Variable	n	Mean	Standard Deviation	Minimum	Maximum	Cronbach Alpha
Satisfaction with Life	61	24.87	5.61	10	34	0.81

As indicated in Table 17, the satisfaction with life mean score of the sample of 61 women who were undergoing infertility treatment at a managed health care facility on the SWLS is 24.87 with a standard deviation of 5.61. The Cronbach alpha coefficient for the SWLS in the current study is 0.81, which confirmed the reliability of the findings. International studies conducted by Pavot and Diener (1993) found the mean score on the SWLS to be 23.5 with a standard deviation of 6.43. Ferreira (2007) obtained a SWLS score of 25.35 for the 31 females of the sample in the investigation of the psychofortology of males and females undergoing infertility. Research on well-being conducted in South Africa by Wissing and Van Eeden (1997), on a multicultural non-clinical sample of 550 males and females yielded a mean score of 23.45 and a standard deviation of 6.32. Odendaal (1999), in another South African study, explored the satisfaction with life of a clinical sample of cardiac patients in rehabilitation, the results of which indicated a mean of 25 and a standard deviation of 7. The satisfaction with life of the current sample recorded a higher mean than that of the non-clinical sample of Wissing and Van Eeden (1997) as well as that of the mean found by Pavot and Diener (1993). The mean of the current sample is marginally lower than that of Odendaal's clinical sample with a lower standard deviation. The implication is that the current sample perceives themselves as generally having a relatively average level of satisfaction with life. These results suggest that despite the recent life altering diagnosis of infertility and the stressful experience of infertility treatment, the majority of the women in this sample still consider themselves to have satisfaction with life.

Schaefer and Moos (1992) commented that a stressful experience could often act as a catalyst for the re-evaluation of life goals and priorities, and as an opportunity for the re-establishment of an individual's sense of self. Studies are providing and supporting a growing body of evidence that stressful experiences or stressful life events may induce positive psychological changes (Affleck & Tennen, 1996; Schaefer & Moos, 1992; Tedeschi & Calhoun, 1996). The SWLS provides a measurement of the cognitive aspect of subjective well-being and allows for the assessment of an individual's overall perception of life rather than only in one specific area of life (Diener, Emmons, Larson & Griffin, 1985). The sample's relatively average level of satisfaction with life suggests that, while the diagnosis and treatment of infertility may be traumatic, their overall evaluation of their lives is not confined solely to the aspect of infertility. It could also be speculated that, since the SWLS affords a cognitive

appraisal, that the women in this sample are able to understand their infertility in relation to other meaningful aspects of their lives.

As discussed previously, subjective well-being, for the purposes of this study, was conceptualised in terms of satisfaction with life and life happiness. The above section explored and described the results of the SWLS, which measured the cognitive component of subjective well-being of satisfaction with life. The following section presents the results of the Affectometer 2, which provides a measurement of the affective component of subjective well-being, namely life happiness.

### 7.2.2 The Affectometer 2 (AFM-2)

The Affectometer 2 (AFM-2) provides a measure of an individual's general happiness or sense of well-being by determining the balance between positive and negative affect in recent experience (Kammann & Flett, 1983). It is a brief, five minute inventory that assesses quality of life on an affective or emotional level, with the overall well-being of an individual determined by the predominance of positive feelings over negative feelings (Kammann & Flett, 1983). This measurement differs from that of the satisfaction with life as it is an affective and not a cognitive measurement of well-being. At an affective level, people who describe themselves as having high levels of subjective well-being mainly feel pleasant emotions, which are primarily due to the continuous appraisal of life events and their environment in general (Diener, 1994; Diener & Suh, 1997). Conversely, people who describe low levels of subjective well-being experience their life circumstances and events as undesirable. They therefore experience unpleasant emotions such as anxiety, depression and anger (Diener, 1994; Diener & Suh, 1997; Myers & Diener, 1995).

The AFM-2 scale is a 40 item scale that is subdivided in two subscales with 20 items each. Each of the two subscales contain 10 positive and 10 negative items to which the respondent is asked to provide an indication of how often they experienced the feeling. The responses are graded on a 5-point Likkert scale that ranges from 'not at all' to 'all the time'. Scores on the AFM-2 range between 0 and 80 with a score of 40 as the neutral point. The total score for general happiness is obtained by subtracting the subtotal for Negative Affect (NA) from the subtotal for Positive Affect (PA) (Wissing & Van Eeden, 1997). A total score of 40 then implies an equal ratio of positive and negative affect experienced by the individual during a recent experience. A total score above 40 on the Positive-Negative Balance scale indicates a higher level

of happiness. Conversely, scores lower than 40 suggest lower levels of happiness or higher levels of unhappiness (Kammann & Flett, 1983). Table 18 displays the participants' positive affect and negative affect and the positive-negative affect balance or the difference between these two variables.

Table 18  
Levels of Happiness of Participants

<b>Variable</b>	<b>n</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Cronbach alpha</b>
Positive Affect (PA)	61	52.67	12.88	28	80	0.96
Negative Affect (NA)	61	29.49	15.34	1	60	0.95
Positive-Negative Affect Balance (i.e., Global Happiness)	61	23.18	27.55	-32	79	0.97

In terms of the Positive Affect Scale, Table 18 indicates that individuals from this sample experienced a range from low levels to high levels of positive affect with a mean score of 52.67 and a standard deviation of 12.88. The lowest score obtained on this scale was 28, while the highest score was the maximum obtainable for the scale of 80. Results yielded by the Negative Affect Scale provided a mean score of 29.49 and a standard deviation of 15.34. In terms of the participants' levels of overall or global happiness, as measured by the Positive-Negative Affect Balance subscale ranged from -32 to 79, which suggests that, while some individuals experienced high levels of happiness, others experienced significantly low levels of global happiness. The mean score on the Positive-Negative Affect Balance (i.e., global happiness) of 23.18 is significantly below the neutral point of 40 and suggests that, generally, the participants experienced low levels of global happiness. In a study that investigated the psychofortology of 31 men and 31 women undergoing infertility treatment at a health care unit in the Nelson Mandela Metropole, Ferreira (2007) found a similar mean of 23.81 for the Positive-Negative Affect Balance for the sample of 31 women. Veenhoven (1994) defined happiness as the degree to which an individual positively evaluates the overall quality of his or her life. Taking cognisance of this definition, the results obtained by this sample suggest that the overall quality of life is not seen in a

positive light. While it is not possible to infer cause and effect with regards to this sample as the participant's level of happiness had not been measured prior to their diagnosis of, and treatment for infertility, the results may be related to the individual's unattained need to conceive and give birth to a child. As discussed in Chapter 2, Domar et al. (1992) found that depression levels were twice as high in infertile women as when compared with a control group of women. Women with a 2-3 year history of infertility had the highest level of depression in comparison to those who had experienced infertility for either less than one year or more than six years (Domar, et al., 1992). The effect of infertility treatment may also have a detrimental effect on levels of happiness. Domar (1992) noted that the effect of prolonged fertility treatments and the monthly cycles of hope and disappointment ultimately lead to increased depressive symptoms amongst women who experienced failure of treatment. It may be possible that the questionnaire for the AFM-2 had been completed at a time when the respondent had either returned for a repeat treatment or had received news of a failed treatment.

### **7.3 Conclusion**

In the above sections, the results of the standardised measures, namely, the CRI, the SOC, SWLS and AFM-2, have been presented and discussed. The findings have been linked to the theory and previous studies that have been reviewed in the literature chapters. The following section provides a description of the cluster analysis, which in keeping with the third aim of the study, was used to group the present sample with regards to their score on each of the different measures.

### **7.4 Cluster Analysis**

Cluster analysis is a descriptive technique that provides the researcher with the opportunity to group or classify people by looking for groupings that are highly similar on a set of psychologically meaningful variables while being dissimilar to other groups on the same set of variables (Everitt & Dunn, 1991; Hale & Glassman, 1986; Hatuell, 2004; Knoff, 1986). It therefore provides a classification of groups that are comparatively homogenous according to a set of classification characteristics (Hair et al., 1995; Hatuell, 2004) and a concise summary of the data that provides a clearer understanding of the results of the study (Everitt & Dunn, 1991).

Cluster analysis was performed in order to realise the third aim of the study, which was: To explore and describe the patterns of coping resources, sense of coherence, satisfaction with life and happiness of women currently undergoing infertility treatment at a privately managed health care unit. Each of the four measures used for this study had different methods of scoring, and in order to facilitate the fair interpretation and comparison of the results, the scores of each measure were converted into T-scores. It was then important to determine the number of clusters to use for the analysis that would yield the most statistically useful solution. By using the k-means clustering method, a three-cluster solution was found to provide the most significant information in terms of interpretation of the results. Table 19 presents the number and percentages of the participants who constituted each cluster. Cluster 2 consisted of 22 participants, while cluster 1 had the least participants (n=16) and cluster 3 the most participants (n=23).

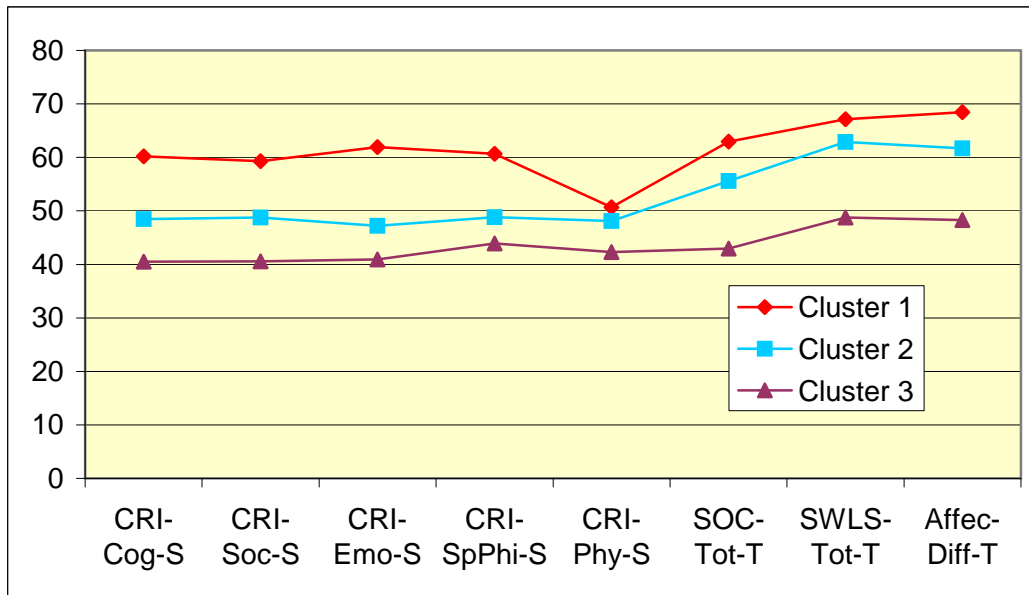
Table 19

Descriptive Statistics for Cluster Analysis

<b>Cluster</b>	<b>n</b>	<b>Percentage</b>
1	16	26.23%
2	22	36.07%
3	23	37.70%
<b>Total</b>	<b>61</b>	<b>100%</b>

Figure 3 provides a graphic representation of the three clusters. As mentioned previously, the cluster analysis was determined by converting the scores on the SOC, SWLS and AFM-2 to T-scores. The scores of the CRI had been converted to scaled scores as per the CRI manual when the measure had been scored. As is depicted on the graph, the participants in cluster 1 had the highest scores on the four measures while the participants in cluster 3 had the lowest scores on the measures.

Figure 3

Cluster Analysis of the Four Standardised Measures

An Analysis of Variance (ANOVA) was conducted in order to determine whether there were significant differences between the three clusters. The ANOVA is a statistical procedure that is used to test the difference between more than two population means (Donnelly, 2007). The ANOVA determined that the differences between the three clusters were statistically significant.

Table 20 presents the descriptive statistics for the three clusters. The CRI scores used for the cluster analysis were the scaled total scores for each subscale. It is important to note that the means and standard deviations have been converted to T-scores so that the four measures could be compared for a reasonable interpretation of the results. **The T-scores were standardised on a mean of 50 and a standard deviation of 10.**



Table 20  
Descriptive Statistics for the Three Clusters

Subscale	Cluster 1 (n=16)		Cluster 2 (n=22)		Cluster 3 (n=23)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
CRI-Cog-S	60.19	5.47	48.45	6.52	40.52	7.53
CRI-Soc-S	59.31	6.11	48.77	6.48	40.57	8.52
CRI-Emo-S	61.94	6.48	47.18	7.57	40.91	7.39
CRI-SpPhi-S	60.69	5.92	48.82	5.71	43.91	7.66
CRI-Phy-S	50.69	9.50	48.09	8.18	42.30	7.10
SOC-Tot-T	62.94	5.40	55.62	3.96	42.95	7.33
SWLS-Tot-T	67.16	5.93	62.88	4.50	48.76	7.51
Affec-Diff-T	68.47	5.88	61.68	5.75	48.30	5.13

These three clusters are discussed separately in the sections that follow.

#### 7.5.1 Cluster One

Cluster one proved to be the smallest cluster and consisted of 16 participants. In terms of the CRI, the cluster reflected above average means on the cognitive, social, emotional and spiritual-philosophical subscales. The mean of the physical subscale (50.69) clustered very closely to the average of 50 and was the lowest of the five subscales of the CRI measure. This suggests that the participants in this cluster place less emphasis on potential physical resources, an example of which would be exercise, to detract from the harmful effects of stress. Cluster one scored highest on the emotional subscale of the CRI with a mean score of 61.94 and a standard deviation of 6.48. This implies that the women in the cluster were more likely to rely on emotional coping resources in order to deal with stress. This subscale also provides a measure of the ability to accept and express a wide range of emotional responses, which could in turn lessen the detrimental effects of stress (Hammer & Marting, 1988).

Cluster one reflected an above average mean of 62.94 for the SOC-29, which suggests that the women in this group have a stronger SOC and are more likely to view their world as meaningful, comprehensible and manageable despite facing a stressor such as infertility. A strong SOC is also linked to a person's ability to discover and mobilise appropriate resources efficiently in order to effectively respond

to a stressor (Antonovsky, 1993). Taking the above average SOC into consideration in conjunction with the subscales of the CRI, all of which except the physical subscale were above average, the results for this cluster in terms of the construct of coping suggests that these 16 women tend to cope relatively well with potential and actual stressors.

The construct of subjective well-being was measured by the SWLS and the AFM-2. Cluster one, with a mean of 67.16 and a standard deviation of 5.93, reflected an above average score for the SWLS and implies that the women in this cluster experienced a high sense of satisfaction with life. The mean for the AFM-2 at 68.47 with a standard deviation of 5.88 is considered to be above average. The average score for this cluster in terms of positive affect was 65.88 while the negative affect reflected an average score of 15 for the women. It may be suggested that the women in this cluster have relatively high or above average levels of happiness.

#### 7.5.2 Cluster Two

The second cluster consisted of 22 participants. The mean scores of the five subscales on the CRI scale proved to fall slightly below the average score of  $T=50$  with the lowest scale being the Emotional scale ( $T=47.18$ ) and the highest, by a slight margin, being the Spiritual Philosophical scale ( $T=48.82$ ). In terms of the SOC scale, this cluster scored slightly above average with a score of  $T=55.62$  and a standard deviation of 3.96. This cluster had an above average score for subjective wellbeing with  $T=62.88$  for the SWLS measure and  $T=61.68$  for the AFM-2. In summary, the women in this cluster appear to have a relatively average ability to cope with life situations but an above average experience of subjective wellbeing. These results tend to contrast the slightly below average score obtained on the emotional scale of the CRI with the above average score on the AFM-2. This suggests that although the women in this cluster generally have an above average level of happiness, they are perhaps not as adept at expressing their emotions openly or not able to regulate their emotions effectively.

#### 7.5.3 Cluster Three

Cluster three was the largest cluster and consisted of 23 women of the sample. The T-scores obtained for this grouping were the lowest of the three clusters on both the coping and subjective well-being measures and all scores were considered to be below

average. The highest score obtained on the CRI was on the Spiritual/Philosophical scale (T=43.91) but still fell below the average of T=50. The score for the SOC was also considered to be below average (T=42.95). In terms of the subjective well-being of this cluster, the score on the SWLS (T=48.76) fell slightly below the average score of T=50 implying a lesser degree of satisfaction with life. Similarly, the score for the AFM-2 (T=48.30) fell slightly below average and suggests that the participants in this cluster favour an imbalance towards negative affect in terms of the positive-negative affect equation. This also suggests that the participants in this cluster are more likely to be unhappier than those in the other two clusters.

#### 7.5.4 Significance of Differences among the Clusters

An ANOVA was performed to determine the statistical significance of differences between the clusters in terms of the variables used from the measures. An ANOVA revealed that with the p-value < .05, there were highly significant differences between the three clusters with regards to the clustering variables. Because this study has focussed on the construct of psychofortology, it was thought to be beneficial to consider the first cluster as having above average psychofortology, the second cluster as having average to above average psychofortology and the third cluster as having below average psychofortology. The statistics for the ANOVA are presented in Table 21

Table 21

ANOVA results for between cluster differences with regard to clustering variables

<b>Variable</b>	<b>F-statistic</b>	<b>df</b>		<b>*p-value</b>
CRI-Cog-S	40.90	2	58	0.000
CRI-SOC-S	31.68	2	58	0.000
CRI-Emo-S	40.61	2	58	0.000
CRI-SpPhi-S	31.40	2	58	0.000
CRI-Phy-S	5.55	2	58	0.006
SOC-Tot_T	60.24	2	58	0.000
SWLS-T	50.25	2	58	0.000
AFM-Diff-T	68.06	2	58	0.000

\* significant p-value (p < .05)

#### 7.6 Summary of the Coping of the Sample

For the purposes of this study, the concept of coping was conceptualised in terms of the sub-constructs of coping resources (measured by the CRI) and the sense of

coherence (measured by the SOC-29). The results of the CRI suggested that, as a whole, the sample of 61 women undergoing infertility treatment had a relatively average level of coping. This conclusion was drawn after comparing the total mean score for the CRI (48.05) to the mean score of 50 as calculated by Hammer and Marting (1988). The results also suggested that the resources associated with the Spiritual/Philosophical domain was the favoured domain of coping resources, while the coping resources associated with the Physical domain were used the least effectively. It may be implied that religion or a spiritual/ personal philosophy was a very important coping resource to the women of the sample. The coping resources associated with the spiritual/philosophical domain serve to create a context in which, and through the perspective of which, stressful events may be interpreted and appraised (Compton, 2005).

In terms of the sense of coherence as measured by the SOC-29, the sample obtained a mean score of 135.21 and in cautious comparison with the mean of 136.52 obtained by Wissing and Van Eeden (1997), it may be concluded that the sample has a relatively average level of sense of coherence. The implication of these results is that the sample is able to view their infertility and other life stressors as comprehensible, manageable and meaningful. Looking at the results of the two sub-constructs of the coping resources and the sense of coherence, it appears that the women of the sample are able to appraise and perceive stressful events and experiences in a manner that allows them to derive meaning from the experience.

A cluster analysis of the measures revealed three differentiated clusters. Cluster one (n=16) displayed an above average level of coping as the women of the sample achieved above average level of coping resources and the SOC. Cluster Two (n=22) had a slightly below average mean score on the CRI and a slightly above average score on the SOC. The coping of this cluster could be described as ranging from a relatively average ability to cope to an above average to cope. Cluster three (n=23) displayed a below average score on both the CRI and SOC, suggesting a below average ability to cope with stressors and life events. Causal factors for the variance in the three clusters is difficult to ascertain as the nature of the study is exploratory-descriptive and the sample size is too small. Possible variables may include the type of ART, period of infertility, success rate of treatment, social support systems and personality traits.

### **7.7 Summary of the Subjective Well-being of the Sample**

For the purposes of this study, the concept of subjective well-being was conceptualised in terms of the satisfaction with life (measured by the SWLS) and life happiness (measured by the AFM-2).

The women who participated in this study obtained a mean score of 24.87 on the SWLS. In a cautious comparison with the results of South African research completed by Wissing and Van Eeden (1997) who obtained a mean score of 23.45, it is evident that the mean of the current sample is slightly higher than that of Wissing and Van Eeden (1997). The mean of the sample used for the present study fell into the 'slightly satisfied' category of the SWLS, suggesting that sample perceived their satisfaction with life as being relatively average. The women in the present sample therefore, despite the experience of infertility and the potentially stressful effects of ART, perceived their lives to be slightly satisfactory.

The mean score for the Positive-Negative Affect Balance or global happiness of the sample on the AFM-2 was 23.18. Comparing these results, with caution, to a South African study conducted by Wissing and Van Eeden (1997), the mean of the current sample is lower than the mean of 29.50 obtained in the former study. A possible reason for the lower score is that the current sample of women had experienced the significant life stressor of infertility.

In terms of the cluster analysis, the first cluster (n=16) reflected above average scores of both satisfaction with life and happiness. Cluster two (n=22) also displayed an above average level of the two subjective well-being measures. Cluster three (n=23) scored below average on the two subjective well-being measures. As discussed in Chapter 5, there are many predictors of subjective well-being. The variance on each of the clusters may be related to a number of predictors for subjective well-being (e.g., personality traits, positive social relationships and positive self-esteem). While it is possible to speculate that these variables may have had an influence in the levels of subjective well-being, the size of the present sample and the exploratory descriptive nature of the study places cause and effect relationships outside the scope of this study.

### **7.8 Conclusion**

This chapter presented the results in terms of the three aims of the study. A detailed description of the sample was provided. Where possible, results were linked

to similar studies as well as to relevant theory discussed in the previous literature chapters. The cluster analysis identified three clusters, which were considered to exhibit above average, average to above average and below average levels of psychofortology. The following chapter focuses on the conclusions, limitations and recommendations of the study.

## **Chapter 8**

### **Conclusions and Limitations**

#### **8.0 Introduction**

This final chapter provides a summary of the conclusions drawn from the results of this study that were presented in the previous chapter. The limitations of the study are discussed as well as the contributions it may make to future research. Finally, the chapter concludes with recommendations for further research in this field.

#### **8.1 Aims of the Study Revisited**

This study aimed to explore and describe the coping resources, sense of coherence, satisfaction with life and happiness of women who have undergone infertility treatment at a privately managed health care unit. These four above-mentioned constructs constitute the very basic construct of psychofortology. The primary aims of the research were:

1. To explore and describe the coping of women undergoing infertility treatment.

This aim specifically entailed the following:

To explore and describe the coping resources of women undergoing infertility treatment.

To explore and describe the sense of coherence of women undergoing infertility treatment.

2. To explore and describe the subjective well-being of women undergoing infertility treatment. This aim specifically entailed the following:

To explore and describe the satisfaction with life experienced by women undergoing infertility treatment.

To explore and describe the life happiness of women undergoing infertility treatment.

3. To explore and describe the patterns of coping resources, sense of coherence, satisfaction with life and happiness of women undergoing infertility treatment at a privately managed health care unit.

#### **8.2 Conclusions based on Results from the Present Study**

The conclusions drawn from this study are formulated in terms of the above-mentioned aims around which the study was conducted:

### **8.2.1 Description of the Coping of the Sample**

The first aim of this study was to explore and describe the coping of the sample of 61 women who were undergoing infertility treatment at the time of data collection. The construct of coping was, for the purposes of this study, further subdivided into the two categories of coping resources and the sense of coherence. A description of the coping resources follows in the next section.

#### 8.2.1.1 Description of the Coping Resources of the Sample

The coping resources of the sample was measured by using Hammer and Marting's (1988) Coping Resources Inventory (CRI). The mean obtained by the current sample for the total of the coping resources scale was 48.05, which is slightly lower than the mean of 50 that was established for the CRI by Hammer and Marting (1988). These results suggest that the women in the sample perceive themselves as having a relatively average level of coping resources.

The means of the cognitive, social, emotional and spiritual /philosophical subscales were clustered closely, if slightly below the mean of 50 as proposed by Hammer and Marting (1988). The physical scale had the lowest mean (46.59), while the mean of the spiritual/philosophical subscale (50.08) was the highest. This suggests that the participants of the sample are likely to regard spirituality as an important coping resource or to rely on a philosophical frame of reference through which they can perceive a stressor or challenge. These findings are similar to those obtained from other South African studies investigating other populations (i.e., Brown, 2002; Cairns, 2001; Ferreira, 2007; Hatuell, 2004; Kirsten, 2003; Madhoo, 1999 & Smith, 2006). The exploratory-descriptive nature limited the researcher with respect to drawing conclusions regarding why the women in this study perceived themselves as having a relatively average level of coping resources while experiencing a demanding and existential stressor such as the experience and treatment of infertility.

This subsection described the first aspect of coping as conceptualised in this study, that is, the coping resources. The following subsection provides a description of sense of coherence, which is the second subconstruct of the second aspect of coping.

#### 8.2.1.2 Description of the Sense of Coherence of the Sample

The sense of coherence was measured by the Orientation to Life Questionnaire (SOC-29) as developed by Antonovsky (1987). With respect to the results obtained



from the SOC-29, the sample obtained a mean score of 135.21, which was only very slightly below the mean of 136.52 obtained in the South African study conducted by Wissing and van Eeden (1997). This implies that the sample of women in this study have a relatively average level of the sense of coherence when compared to the research conducted by Wissing and van Eeden (1997). The results suggest that the women in this sample, despite the experience of infertility and infertility treatment, are able to comprehend, manage and find meaning of their experience in the context of other aspects of their lives. Taking into consideration that this sample had the highest mean on the Spiritual/Philosophical domain of the CRI, it is plausible to speculate that the women in this sample are able to find a sense of meaning in times of hardship or existential threat. Research has also shown that the experience of a stressful or traumatic event or life experience (e.g., the diagnosis of infertility and the treatment thereof) may incite positive psychological changes within the person (Affleck & Tennen, 1996; Compton, 2005, Schaefer & Moos, 1992). The exploratory-descriptive nature of this study, however, does not permit the researcher to draw definite conclusions or to define a cause-and-effect relationship regarding the possible influence of the diagnosis of infertility and the relatively average level of the sense of coherence.

This subsection provided a concise description of the coping of the sample of women undergoing infertility treatment by providing descriptions of the coping resources and sense of coherence of the sample. The next section focuses on the subjective well-being of the sample.

### **8.2.2 Description of the Subjective Well-being of the Sample**

The second aim of the study was to explore and describe the subjective well-being of the sample of 61 women who were undergoing infertility treatment at the time of data collection. Subjective well-being as a construct was subdivided into the two categories of the more cognitive component of satisfaction with life and the more emotive component of happiness. The following subsection provides a description of the satisfaction with life (the cognitive component of subjective well-being) of the sample.

#### 8.2.2.1 Description of the Satisfaction With Life

The sample's satisfaction with life was measured by the Satisfaction with Life Scale (SWLS), which measures the subjective well-being of respondents on a cognitive, judgemental level (Diener, Emmons, Larsen & Griffin, 1985). The women who participated in this study obtained a mean score of 24.87. There are no established South African norms for the SWLS, and therefore, in a cautious comparison with South African research completed by Wissing and Van Eeden (1997) who obtained a mean score of 23.45, it is evident that the mean of the current sample is slightly higher than that of Wissing and Van Eeden (1997). The mean of the sample used for the present study fell into the 'slightly satisfied' category of the SWLS, suggesting that sample perceived their satisfaction with life as being relatively average. The women in the present sample therefore, despite the experience of infertility and the potentially stressful effects of ART, perceived their lives to be slightly satisfactory. The reasons for these results, owing to the exploratory-descriptive nature of the study,

may not be concluded with certainty but the researcher speculated that the women in this sample may not necessarily appraise themselves as having failed in life based solely on their difficulty to conceive. As discussed in Chapter 5, there are a number of personality and dispositional predictors of subjective well-being (e.g., optimism and extraversion), some of which may have bearing in the respondent's lives. Since satisfaction with life provides a global assessment of subjective well-being, it is not necessarily useful to assume that the experience of infertility alone could have a positive or negative effect on the individual's subjective well-being.

The above section provided a brief description of the satisfaction with life of the sample of 61 women undergoing infertility treatment. The following section discusses the life happiness or affective component of subjective well-being of the current sample.

#### 8.2.2.2 Description of the Life Happiness of the Sample

The affective component of subjective well-being (i.e., life happiness), was measured by the Affectometer-2 (AFM-2) (Kammann & Flett, 1983). The AFM-2 is scored by subtracting the total positive affect (PA) score from the total negative affect (NA) score to obtain a Positive-Negative Balance or an indication of global happiness. The mean score for the Positive-Negative Affect Balance or global happiness of the sample was 23.18. Comparing these results, with caution, to a South

African study conducted by Wissing and Van Eeden (1997), the mean of the current sample is lower than the mean of 29.50 obtained in the former study. A study conducted by Ferreira (2007) in which the psychofortology of 31 males and 31 females undergoing infertility treatment was investigated, the mean score on the AFM-2 was 23.81, which is similar to the mean score obtained for the 61 women of this sample. The lower score obtained by this current sample in relation to that of Wissing and Van Eeden (1997) may be as a result of the propensity of women to report emotions more intensely (Diener, Sandvik & Larsen, 1985). Women also tend to experience the social effects (e.g., alienation, feeling isolated, depressed or anxious) more keenly than their male partners (Cooper-Hillbert, 1998; Dunkel-Schetter & Lobel, 1991; Lee et al., 2000).

The above subsections provided a brief description of the subjective well-being (i.e., the satisfaction with life and the life happiness) of the sample of 61 women undergoing infertility treatment. The following section considers the third aim of the study.

### 8.2.3 Description of the Patterns of the Coping and Subjective Well-being of the Sample

The third aim of the study was to explore and describe the patterns of coping and subjective well-being of the sample of women undergoing infertility treatment. The small sample size and the exploratory-descriptive design of the study precludes the possibility of presupposing causal or explanatory links between sets of data. A cluster analysis revealed three distinct clusters that differed significantly from each other on the measures. The first cluster presented with above average levels of coping and subjective well-being and was considered as having an above average level of psychofortology. Means on the coping scales and subjective well-being scales in the second cluster were described as ranging from average to above average and therefore the second cluster was referred to as having an average to above average level of psychofortology. The third cluster displayed below average levels of coping and subjective well-being and was termed as having a below average level of psychofortology.

While it is not possible to draw inferences between the biographical variables and the results of the measures, it may be suggested that the variance in the levels of psychofortology between the three clusters may possibly be related to personal

characteristics or personality traits. For example, women in the first cluster may be optimistic or extroverts who are able to efficiently form and mobilise support networks in times of distress. Other factors might include method of infertility treatment, the length of time that they have received treatment, the success rate of treatment and the perception of support from the spouse/partner, family and friends.

### **8.3 The Value of the Research**

This research was conducted in response to a traditional paucity of literature related to coping and well-being of women undergoing infertility treatment in South Africa. The choice of a psychofortigenic approach involving the constructs of coping, sense of coherence, subjective well-being and happiness, was made in order to further contribute to a burgeoning field of research focussed on positive human traits and ways of being in the face of perceived adversity and challenge. This study also contributes to the basic understanding of some of the factors that allow women faced with the challenge of infertility and treatment to cope more efficiently with stressors and in this manner enhance their subjective well-being.

The results of this study demonstrate that even though the women in this sample were confronted with the challenge of infertility and the stressful experience of infertility treatment, they were still able to cope and experience a relative level of satisfaction with their lives. However, the implication of the lower levels of life happiness reflected by the sample of 61 women undergoing infertility treatment, is that there is a need for some form of emotional assistance in order to enhance subjective well-being. The findings of this study depicted a need for an understanding of the unique dynamics and psychology of women diagnosed with and undergoing infertility treatment. The value, therefore, of this study may lie in the future possibilities of psychological counselling, the formation of support or treatment groups, increased awareness of the emotional needs of women diagnosed with infertility among their friends and families, and enhanced physician-patient interaction and understanding.

The importance of this study and others in the field of positive psychology is that it promotes a way of thinking that is focussed on enhancing innate skills and capacities. Providing feedback to those who have requested it may aid in that individual's level of self-knowledge and serve as an encouragement and a tool for empowerment. The feedback may also spur the individual on to identify and change

areas or aspects of their lives that may be detracting from their coping and subjective well-being.

Despite the values of this research as presented above, there were various limitations to the study that, for the benefit of future studies in this field, requires further discussion. The limitations of this study are detailed in the next section.

#### **8.4 Limitations of the Research**

The results obtained and conclusions drawn from this study needs to be considered in relation to the limitations of this study. A relatively small sample of 61 women was used for the purposes of the research and was obtained by means of the purposive sampling research method. This sample was selected from a privately managed health care facility and consisted of women who could afford to pay for the costs of the various medical procedures involved in infertility treatment. It must therefore be noted that the sample is not representative of the general South African population and the results of the study should not be generalised or seen as as a representation of the larger population of women undergoing infertility treatment. The small sample size also limited the extent to which the significance of biographical variables in relation to the measures used could be explored.

While the CRI and the AFM-2 were available in English and Afrikaans, the SOC-29 and the SWLS were only available in English. Although an inclusion criterion for the study was at least a Grade 10 level of proficiency in reading and writing in English, the possibility that each participant could not complete all the questionnaires in their first language should be noted as a significant limitation. Although there were no cultural inclusion criteria stipulated for this study, the fact that only 3% of the sample indicated Xhosa as their home language, suggests that it would be inadvisable to generalise the findings to all cultural groups in South Africa.

The biographical questionnaire was constructed by the researcher and not standardised to any population or sample. This questionnaire was limited in scope and may have omitted important or potentially useful biographical items that could have added insight to the study.

Another limitation related to self-report measures and questionnaires is the possibility that the respondent may be answering in a manner that does not hold true for him/her at that particular moment. Snyders and Lopez (2005) advised a measure of caution in terms of self- report measures as respondents may report that they are

happy when they are not actually experiencing high levels of subjective well-being. The use of four different measures was used for this study in the hope of counteracting the possibility that the respondent may have been faking good or faking bad. According to Snyders and Lopez (2005), a limitation in subjective well-being research occurs when individuals are asked to rate their global well-being. Since this is a cognitive judgement, these thoughts may not correspond to the average mood or life satisfaction across various moments. They further noted that a person's estimate of happiness and affect across time may be coloured by that person's current mood, a personal philosophy about happiness and the readiness with which they retrieve and release positive and negative information. It is not known what the situational variables or what personal circumstances and philosophies may have influenced the respondents at the time of completing the questionnaires.

These limitations have been discussed in order to encourage an objective perspective in relation to the results obtained from the study as well as the study as a whole. The following section explores recommendations for future research.

### **8.5 Recommendations for Future Research**

Since the present study focussed only on a small sample of 61 women from a single privately managed health care unit, it is highly recommended that a study of this nature be replicated in the future with larger and more representative samples of the population. It would benefit this field of research if future samples were also taken from governmental or non-private health care facilities. In this way, the conclusions drawn would reflect results that would be more generalisable to a larger and more diverse population of women in South Africa. This would be particularly important as much of the research in the field of infertility is conducted outside of South Africa. It is, therefore, strongly recommended that the measures used for this study be standardised and translated for use among all the major language groups in South Africa. Future researchers are also encouraged to obtain equal and sufficient groupings of variables, for example, age, marital status and socioeconomic status, to enable the closer exploration of various biographical variables in terms of women undergoing infertility treatment.

The incorporation of qualitative research together with quantitative data would serve to enrich the data collected and provide further dimensions to the understanding of the field of infertility, infertility treatment and psychofortology. Qualitative data

would provide the opportunity for the participants to discuss personal and unique aspects of their experience and so provide a more in-depth understanding of the aspects of stress, coping and subjective well-being of women undergoing infertility treatment. These insights and research findings might prove invaluable in terms of possible therapeutic programmes and interventions.

Infertility has been noted as a concern that affects the couple system (Coper-Hillbert, 1998). It is therefore recommended that more studies be conducted with samples of males in a couple system experiencing infertility as well as looking at both partners in the system. Information gathered from these types of studies may pave the way for therapeutic guidelines relevant to South African cultures and may provide insight into developing therapeutic intervention strategies and support structures for individual and couple counselling.

Longitudinal research methods are recommended for the study of stress and coping (Lazarus, 2000) as it allows for the observation of possible changes in psychological reactions over time. It is therefore recommended that future research also include longitudinal studies in order to monitor and explore the constancy or variation in coping responses and resources in response to the stressor of infertility and levels of subjective well-being across a span of time. Results obtained from these studies would contribute to a growing knowledge base of psychofortology in South Africa.

## **8.6 Conclusion**

This study aimed to explore and describe the coping and subjective well-being of women undergoing infertility treatment at a privately managed health care unit. Another aim of the study was to explore the possibility of patterns of coping resources and subjective well-being in the sample. Although the small sample of 61 women provides a limitation of the extent to which the results may be generalised to the larger population, the value of this study lies in the contribution it has made to the understanding of the psychofortology of women undergoing infertility treatment. Primary recommendations arising from this study are that future fortigenic research should use larger and more diverse sample groups, employ longitudinal research designs and incorporate qualitative data to enrich and provide deeper insight into the psychofortology of women undergoing infertility treatment.

## REFERENCES

- Abbey, A., Andrews, F. M., & Halman, I. J. (1992). Is infertility-problem stress different? The dynamics of stressing in fertile and infertile couples. *Fertility and Sterility*, *57*, 1247-1253.
- Abi-Hashem, N. (2001). Rediscovering hope in American psychology. *American Psychologist*, *56*(1), 85-86.
- Adler, N.E., Keyes, S., & Robertson, P. (1991). Psychological issues in new reproductive technologies: Pregnancy- inducing technology and diagnostic screening. In J. Rodin and A. Collins (Eds.), *Women and new reproductive technologies: Medical, psychosocial, legal and ethical dilemmas*. Hillsdale, NJ: Lawrence Erlbaum.
- Affleck, G., & Tennen, H. (1996). Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of Personality*, *64*, 899-922.
- Anderson, K. M., Sharpe, M., Rattray, A., & Irvine, D. S. (2003). Distress and concerns in couples referred to a specialist infertility clinic. *Journal of Psychosomatic Research*, *54*(4), 353-355.
- Andrews, F.M., & Withey, S.B. (1976). *Social indicators of well-being*. New York, NY: Plenum Press.
- Annandale, E. (1998). *The sociology of health and medicine*. Cambridge: Polity.
- Anson, O., Carmel, S., Levenson, A., Bonneh, D., & Moaz, B. (1993). Coping with recent life events: The interplay of personal and collective resources. *Behavioral Medicine*, *18*(4), 159-166.
- Antonovsky, A. (1979). *Health, stress and coping*. San Francisco, CA: Jossey-Bass.
- Antonovsky, A. (1984). The sense of coherence as a determinant of health. In J.D. Matarazzo, S.M. Weiss, J.A. Herd, & M.E. Miller (Eds.), *Behavioural health: A handbook of health enhancement and disease prevention* (pp. 114-129). New York, NY: Wiley-Interscience.
- Antonovsky, A. (1987). *Unravelling the mystery of health*. San Francisco, CA: Jossey- Bass.
- Antonovsky, A. (1993). The sense of coherence as a determinant of health. In A. Beattie, M. Gott, L. Jones & M. Sidell. (Eds.), *Health and wellbeing: A reader*. (pp. 203-211). Hampshire, London: MacMillan.



- Antonovsky, A. (1996). The salutogenic model as a theory guide to health promotion. *Health Promotion International, 11*, 11-18.
- Appley, M.H., & Trumbull, R. (1986). *Dynamics of stress: Physiological, psychological and social perspectives*. New York, NY: Plenum Press.
- Argyle, M. (1987). *The psychology of happiness*. London: Routledge.
- Argyle, M. (1999). Causes and correlates of happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundation of hedonic psychology*. New York, NY: Russell Sage Foundation.
- Arney, W.R., & Bergen, B. (1984). *Medicine and the management of living: Turning the last great beast*. London: University of Chicago Press.
- Aspinwall, L.G., & Taylor, S.E. (1992). Modeling cognitive adaptation: A longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *Journal of Personality and Social Psychology, 63*(6), 989-1003.
- Azar, B. (1999). Probing links between stress and cancer. *APA Monitor, 30*(6), 15.
- Babbie, E. (1990). *Survey research methods*. (2<sup>nd</sup> ed.). Belmont, CA: Wadsworth
- Babbie, E. (1992). *The practice of social research*. (6<sup>th</sup> ed.). Belmont, CA: Wadsworth.
- Baetens, P. (2002). Special questions in counselling: pregnancy after infertility treatment. In J. Boivin & H. Kantenich (Eds.), *ESHRE Monographs: Guidelines for counselling in infertility*, (pp. 21-22). London: Oxford University Press.
- Bailey, K.D. (1987). *Methods of social research* (3<sup>rd</sup> ed.). London: Collier Macmillan.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.
- Barnard, C.P. (1994). Resilience: A shift in our perception? *American Journal of Family Therapy, 22*, 135-144.
- Barker, C., Pistrang, M., & Elliot, R. (1994). *Research methods in clinical and counselling psychology*. Chichester, England: John Wiley & Sons
- Basic Behavioral Science Task Force of the National Advisory Mental Health Council (1996) Basic behavioral science research for mental health: Vulnerability and resilience. *American Psychologist, 52*, 22-28.
- Bassin, D., Honey, M., & Kaplan, M. M. (1994). Introduction in D. Bassin, M. Honey & M.M. Kaplan (Eds.), *Representations of motherhood*. New Haven, CT: Yale University Press.

- Baumeister, R.F. (1991). *Meanings of life*. New York, NY: Guilford Press.
- Ben-Eliyahu, S., Yirmiya, R., Liebeskind, J.C., Taylor, A.N., & Gale, R.P. (1991). Stress increases metastatic spread of mammary tumour in rats: Evidence for mediation by the immune system. *Brain, Behaviour, and Immunity*, 5, 193-205.
- Benjamin, L.T. Jr. (1992). The history of American psychology (Special issue). *American Psychologist*, 47(2).
- Berg, B.J., & Wilson, J.F. (1990). Psychiatric morbidity in the infertile population: A reconceptualization. *Fertility and Sterility*, 53, 654-661.
- Berg, B. (1994). A researcher's guide to investigating the psychological sequelae of infertility: methodological considerations. *Journal of Psychosomatic Obstetrics and Gynaecology*, 15(3), 147-156.
- Berkman, L.F. (1986). Social networks, support, and health: Taking the next step forward. *American Journal of Epidemiology*, 123, 559-562.
- Bernstein, G.S., & Siegel, M.S. (1991). Male factor in infertility. In D.R. Mishell, V. Davajan, & R. Lobo (Eds.), *Infertility, contraception & reproductive technology*. (3<sup>rd</sup> ed.). Boston: Blackwell Scientific Publications.
- Bradburn, N. (1969). *The structure of psychological well-being*. Chicago, IL: Adine.
- Brand, H. J., Roos, S.S., & van der Merwe, A.B. (1982). Psychological stress and infertility: Part 1. Psychological reaction patterns. *British Journal of Medical Psychology*, 55, 379-384.
- Brannon, L., & Feist, J. (1997). *Health psychology: An introduction to behaviour and health*. (3<sup>rd</sup> ed.). Pacific Grove, CA: Brooks/Cole.
- Brassic, J.R. (1998). Pets and health. *Psychological Reports*, 83, 1011-1024.
- Braverman, L. (1989). Beyond the myth of motherhood. In M. McGoldrick, C.M. Anderson, & F. Walsh (Eds.), *Women in families. A framework for family therapy*. New York: W.W. Norton & Company.
- Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology*, 36, 917-927.
- Brinsmead, M., Guttman, S., Oliver, M., Stanger, J., Clark, L., & Adler, R. (1986). Demographic and personality characteristics of couples undergoing in vitro fertilisation. *Clinical Reproduction and Fertility*, 4, 373-381.

- Brown, O. (2002). *The biopsychosocial coping and adjustment of medical professional women*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Boivin, J. (2002). Who is likely to need counselling? In J. Boivin & H. Kentenich (Eds.), *ESHRE Monographs: Guidelines for counselling in infertility*, p.9-10.
- Boivin, J., & Kentenich, H. (2002). *ESHRE Monographs: Guidelines for counselling in infertility*. London: Oxford University Press.
- Boivin, J., Scanlan, L., & Walker, S.M. (1999). Why are infertile couples not using psychosocial counselling? *Human Reproduction*, 14, 384-391.
- Bunton, R., & Petersen, A. (Eds.), (1997). *Foucault, health and medicine*. London: Routledge.
- Burns, N., & Grove, S.K. (1993). *The practice of nursing research* (2<sup>nd</sup> ed.). New York, NY: McGraw-Hill.
- Buss, D.M. (2000). The evolution of happiness. *American Psychologist*, 55(1), 15-23.
- Cairns, D. (2001). *The coping resources and sense of coherence of cancer patients*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Campbell, A. (1981). *The sense of well-being in America*. New York, NY: McGraw-Hill.
- Campbell, A., Converse, P.E., & Rogers, W.L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*. New York: Russell Sage Foundation.
- Caplan, A.L., Engelhardt, H.T., & McCartney, J.J. (1981). *Concepts of health and disease: Interdisciplinary perspectives*. London: Addison-Wesley Publishing Company.
- Canon, W.B. (1939). *The wisdom of the body*. New York, NY: Norton.
- Carr, A. (2004). *Positive psychology: The science of happiness and human strengths*. New York, NY: Brunner-Routledge.
- Carstens, J.A. (1995). *The relationship between sense of coherence and depression*. Unpublished Masters treatise, University of Stellenbosch, Stellenbosch.
- Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). *Concepts of health and disease: Interdisciplinary perspectives*. London: Addison-Wesley.
- Cassel, J. (1976). The contribution of the social environment to host resistance. *American Journal of Epidemiology*, 104, 107-123.

- Clapp, D. (1985). Emotional responses to infertility. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 32-36.
- Clark, A.E., & Oswald, A.J. (1994). Unhappiness and unemployment. *Economic Journal*, 104, 648-659.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38, 300-314.
- Collins, P.H. (1994). Shifting the center: Race, class, and feminist theorizing about motherhood. In D. Bassin, M. Honey & M.M. Kaplan (Eds.), *Representations of motherhood*. New Haven, CT: Yale University Press.
- Cohen, S., & Willis, T.A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Compton, W.C. (2000). Meaningfulness as a moderator of subjective well-being. *Psychological Reports*, 87, 156-160.
- Compton, W.C. (2005). *Introduction to positive psychology*. Belmont, CA: Thomson Wadsworth.
- Connolly, K. J., Edelman, R. J., Cooke, I.D., & Robson, J. (1992) The impact of infertility on psychological functioning. *Journal of Psychosomatic Research*, 36(5), 373-381.
- Cooper-Hillbert, B. (1998). *Infertility and involuntary childlessness: Helping couples to cope*. New York, NY: W.W. Norton.
- Costa, P.T., & McCrae, R.R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology*, 38(4), 668-678.
- Costa, P.T., & McCrae, R.R. (1986). Personal stability and its implications for clinical psychology. *Clinical Psychology Review*, 6, 407-423.
- Costa, P.T., McCrae, R. R., & Norris, A.H. (1981). Personal adjustment to aging: Longitudinal prediction from neuroticism and extraversion. *Journal of Gerontology*, 36, 78-85.
- Costa, P.T., McCrae, R.R., & Zonderman, A.B. (1987). *British Journal of Psychology*, 78, 299-306.
- Covington, S.N. (1987). Psychosocial evaluation of infertile couples: Implications for social work practice. *Journal of Social Work and Human Sexuality*, 6, 21-36.
- Cozby, P.C. (1993). *Methods in behavioural research* (5<sup>th</sup> ed.). Mountain View, CA: Mayfield.

- Cummins, R.A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research*, 38(3), 303-328.
- Cwikel, J., Gidron, Y., & Sheiner, E. (2004). Psychological interactions with infertility among women. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 117(2), 126-131.
- Dane, F.C. (1990). *Research methods*. Pacific Grove, CA: Brooks/Cole.
- Daniluk, J.C. (1988). Infertility: intrapersonal and interpersonal impact. *Fertility and Sterility*, 49, 982-990.
- Daniluk, J.C. (1997). Gender and infertility. In S.R. Leiblum (Ed.), *Infertility: Psychological issues and counselling strategies*. New York, NY: Wiley.
- Danner, D., Snowdon, D., & Friesen, W. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology*, 80, 804-813.
- Davajan, V., & Israel, R. (1991). Diagnosis and medical treatment of infertility. In A.L. Stanton & C. Dunkel-Schetter (Eds.), *Infertility: Perspectives from stress and coping research*. New York, NY: Plenum Press.
- Deci, E.L. (1975). *Intrinsic motivation*. New York, NY: Plenum Press.
- Deci, E.L. (1980). *The psychology of self-determination*. Lexington, MA: Lexington Books.
- De Vos, A.S. (1998). *Research at grass roots: A primer for caring professions*. Pretoria: Van Schaik.
- De Vos, A.S. (2000). *Research at grass roots: A primer for caring professions*. Pretoria: Van Schaik.
- Dhawliwal, L.K., Gupta, K.R., Gopalan, S., & Kulhara, P. (2004). Psychological aspects of infertility due to various causes-prospective study. *International Journal of Fertility and Women's Medicine* 49(1), 44-48.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542-575.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a National Index. *American Psychologist*, 55(1), 34-43.
- Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? A literature review and guide to needed research. *Social Indicators Research*, 57, 119-169.
- Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, 68, 653-663.

- Diener, E., & Fujita, F. (1997). Social comparisons and subjective well-being. In B. Buunk & R. Gibbons (Eds.), *Health, coping, and social comparison* (pp. 329-357). Mahwah, NJ: Erlbaum.
- Diener, E., Fujita, F., & Sandvik, E. (1994). What subjective well-being researchers can tell emotion researchers about affect. In N. Frijda (Ed.), *Proceedings of the 8<sup>th</sup> Meeting of the International Society for Research on Emotion*. Cambridge, England: Cambridge University.
- Diener, E., & Larsen, R. J. (1993). The subjective experience of emotional well-being. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 405-415). New York: Guilford Press.
- Diener, E., Larsen, R. J., & Emmons, R. A. (1984). Person X situation interactions: Choice of situations and congruence response models. *Journal of Personality and Social Psychology*, *47*, 580-592.
- Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, *54*, 403-425.
- Diener, E., Sandvik, E., & Larsen, J. (1985). Age and sex effects for emotional intensity. *Developmental Psychology*, *21*(3), 542-546.
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology*, *69*(1), 130-141.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*(2), 276-302.
- Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research*, *28*, 195-223.
- Diener, E., Wolsic, B., & Fujita, F. (1995). Physical attractiveness and subjective well-being. *Journal of Personality and Social Psychology*, *69*(1), 120-129.
- Domar, A. D. (1997). Stress and infertility in women. *Infertility: Psychological issues and counselling strategies*. New York, NY: John Wiley and Sons.
- Domar, A. D., Seibel, M., & Benson, H. (1990). The mind/body programme for infertility: A new behavioral treatment approach for women with infertility. *Fertility and Sterility*, *53*, 246-249.

- Domar, A.D., Broome, A., Zuttermeister, M., & Friedman, R. (1992). The prevalence and predictability of depression in infertile women. *Fertility and Sterility*, *58*, 1158-1163.
- Domar, A.D., Zuttermeister, P.C., & Friedman, R. (1993). The psychological impact of infertility, a comparison with patients with other medical conditions. *Journal of Psychosomatics, Obstetrics & Gynaecology*, *14*, 45-52.
- Donahue, E.M., Robins, R.W., Roberts, B.W., & John, O.P. (1993). The divided self: Concurrent and longitudinal effect of psychological adjustment and social roles on self-concept differentiation. *Journal of Personality and Social Psychology*, *64*, 834-846.
- Donnelly, R.A. (2007). *The complete idiot's guide to statistics*. (2<sup>nd</sup> ed.). New York, NY: Alpha Books.
- Dooley, M. (2006). *Fit for fertility: Overcoming infertility and preparing for pregnancy*. London: Hodder Mobius.
- Dore, H. (1990). *Coping with stress*. London: Hamlyn.
- Doyal, L. (1995). *What makes women sick: Gender and the political economy of health*. Hampshire: Macmillan Press.
- Doyle, D., Hanks, G.W.C., & MacDonald, N. (2001). *Oxford textbook of palliative medicine*. New York, NY: Oxford University Press.
- Dubos, R.J. (1960). *The mirage of health*. London: Allen & Unwin.
- Dunkel-Schetter, C., & Lobel, M. (1991). Psychological reactions to infertility. In A.L. Stanton & C. Dunkel-Schetter (Ed.), *Infertility: Perspectives from stress and coping research*. (p.29-54). New York, NY: Plenum Press.
- Eckenrode, J. (1991). *The social context of coping*. New York, NY: Plenum Press.
- Edelmann, R. J., & Connolly, K. J. (2000). Gender differences in response to infertility and infertility investigations: real or illusory. *British Journal of Health Psychology*, *5*, 365-375.
- Edelman, S., & Kidman, A.J. (1997). Mind and cancer: Is there a relationship?- A review of the evidence. *Australian Psychologist*, *32*(2), 79-85.
- Elkonin, D.; Foxcroft, C.; Roodt, G., & Astbury, G. (2001). The use of assessment measures in various applied contexts. In C. Foxcroft & G. Roodt (Eds.), *An Introduction to psychological assessment in the South African context*. Cape Town: Oxford University Press.

- Evans, R., & Hubbs-Tait, L. (1991). *Applying psychology in today's world: Strategies for personal growth*. Upper Saddle River, NJ: Prentice Hall.
- Everly, G.S., & Rosenfeld, R. (1983). *The nature and treatment of the stress response: A practical guide for clinicians*. New York, NY: Plenum Press.
- Everitt, B., & Dunn, G. (1991). *Applied multivariate data analysis*. London: Edward Arnold.
- Eysenck, M.W. (1990). *Happiness: Facts and myths*. East Sussex: Lawrence Erlbaum Associates.
- Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin*, *111*, 304-341.
- Feldt, T., Kinnunen, U., & Mauno, S. (2000). A mediational model of sense of coherence in the work context: A one year follow-up study. *Journal of Organizational Behaviour*, *21*, 461- 476.
- Ferraro, K.F., & Kelley-Moore, J.A. (2000). Religious consolation among men and women: Do health problems spur seeking? *Journal for the Scientific Study of Religion*, *39*, 220-235.
- Ferreira, H.J. (2005). *The experience of married couples undergoing infertility treatment*. Unpublished Honours treatise, Nelson Mandela Metropolitan University in the Department of Psychology, Port Elizabeth, South Africa.
- Ferreira, H.J. (2007). *The psychofortology of male and female patients undergoing infertility treatment*. Unpublished Masters treatise, Nelson Mandela Metropolitan, South Africa.
- Ferring Pharmaceuticals. (2002). *A guide to managing infertility*. Kempton Park: South Africa.
- Fink, A., & Kosekof, J. (1998). *How to conduct surveys: A step by step guide* (2<sup>nd</sup> ed.). London: Sage.
- Foucault, M. (1976). *The birth of the clinic: An archaeology of medical perception*. London, Tavistock.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218-226.
- Fredrickson, B. L. (2002). Positive emotions. In C. R. Snyder & S. Lopez (Eds.), *Handbook of positive psychology* (pp. 120-134). New York, NY: Oxford University Press.



- Frenz, A.W., Carey, M.P., & Jorgensen, R.S. (1993). Psychometric evaluation of Antonovsky's Sense of Coherence Scale. *Psychological Assessment, 3*(2), 145-153.
- Friedman, H. (1989). The role of emotional expression in coronary heart disease. In A. Seligman & T. Dembrowski (Ed.), *In search of coronary-prone behaviour beyond Type A*. New Jersey: Lawrence Erlbaum Associates.
- Fujita, F. (1991). *An investigation of the relation between extroversion, neuroticism, positive affect, and negative affect*. Unpublished Masters thesis, University of Illinois.
- Fujita, F., Diener, E., & Sandvik, E. (1991). Gender differences in negative affect and well-being: The case for emotional intensity. *Journal of Personality and Social Psychology, 61*, 427-434.
- Gal, S. (2004). *The subjective well-being and anxiety levels of full-time employed married mothers*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- George, L.K., & Landerman, R. (1984). Health and subjective well-being: A replicated secondary data analysis. *International Journal of Aging and Human development, 19*, 133-156.
- Glenn, E.N. (1994). Social constructions of mothering: a thematic overview. In E.N. Glenn, G. Chang, & L.R. Forcey (Eds.), *Mothering, ideology, experience, and agency*. London: Routledge.
- Gravetter, F.J., & Wallan, L.B. (2004). *Statistics for the behavioral sciences*. (6<sup>th</sup> ed.). Belmont, CA: Thomson Wadsworth.
- Grieve, K. W. (2001). Interpreting and reporting assessment results. In C. Foxcroft & G. Roodt (Eds.), *An introduction to psychological assessment in the South African context*. Cape Town: Oxford University Press.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1995). *Multivariate data analysis with readings*. (4<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Hammer, A.L., & Marting, M.S. (1988). *Manual for the Coping Resources Inventory: Research edition*. Palo Alto, CA: Consulting Psychologists Press.
- Harris, M.B. (1998). *Basic statistics for behavioural science research*. (2<sup>nd</sup> ed.). Boston: Allyn & Bacon.

- Hatuell, C. (2004). *The subjective well-being and coping resources of overweight adults at Port Elizabeth fitness centres*. Unpublished Masters treatise: Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Heady, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Towards a dynamic equilibrium model. *Journal of Personality and Social Psychology* 57(4), 731-739.
- Helman, C.G. (2001). *Culture, health and illness*. New York, NY: Arnold.
- Helson, H. (1947). Adaptation-level as frame of reference for prediction of psychosocial data. *American Journal of Psychology*, 60, 1-29.
- Hirsch, A., & Hirsch, S. M. (1989). The effect of infertility on marriage and self-concept. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 1, 13-20.
- Hittner, J.B. (2000). Novel methods for analyzing multifaceted personality scales: Sense of coherence and depression as an example. *Journal of Psychology*, 134(2), 199-209.
- Hobfall, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524.
- Hobfall, S.E. (2001). The influence of culture, community and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review*, 50, 337-421.
- Hobfall, S.E., & Freedy, J. (1993). Conservation of resources: A general stress theory applied to burnout. In W.B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research*. Washington, DC: Taylor & Francis.
- Holm, J.E., Ehde, D., Lamberty, K.J., Dix, A., & Thompson, J. (1988). *Sense of coherence: Psychometric properties*. Paper presented at the meeting of the association for the Advancement of Behavior Therapy, New York.
- Honea-Fleming, P. (1986). Psychosocial components in obstetric/gynaecologic conditions with a special consideration of infertility. *Alabama Journal of Medical Sciences*, 23, 27-30.
- Horley, J., & Lavery, J.J. (1995). Subjective well-being and age. *Social Indicators Research*, 34, 275-282.
- Howell, D.C. (1989). *Fundamental statistics for behavioral sciences*. (2<sup>nd</sup> ed.). Boston: PWS-Kent.

- Hoyle, R., Kernis, M, Leary, M., & Baldwin, M. (1999). *Selfhood: Identity, esteem and regulation*. Boulder, CO: Westview press.
- Human Fertilisation and Embryology Authority (2005/2006). *The HFEA Guide to infertility and directory of clinics*. [On-line]. Available: <http://www.hfea.gov.uk>. Accessed 3 January 2007.
- Huyshamen, G.K. (1994). *Methodology for the social and behavioral sciences*. Pretoria, Southern Book Publishers.
- Jaffe, J.M., Albee, G.W., & Kelly, L.D. (1984). *Readings in primary prevention of psychopathology*. Hanover, NH: University Press of New England.
- Jenkins, R.A., & Pargament, K.I. (1995). Religion and spirituality as resources for coping with cancer. *Journal of Psychosocial Oncology*, 13, 51-75.
- Jennings, S.E. (Ed.) (1995). *Infertility counselling*. Oxford: Blackwell Science.
- Johnson, S.C., & Spilka, B. (1991). Coping with breast cancer: The roles of clergy and faith. *Journal of Religion and Health*, 30, 21-33.
- Johnston, M., Shaw, R., & Bird, D. (1987). 'Test-tube baby' procedures: stress and judgements under uncertainty. *Psychological health*, 1, 25-38.
- Johnston, M. (1993). Reproductive Issues: Decisions and distress. In C. Niven & D. Carroll (Eds.), *The health psychology of women*. Chur, Switzerland: Harwood Academic.
- Kammann, R., & Flett, R. (1983). Affectometer-2: A scale to measure current level of general happiness. *Australian Journal of Psychology*, 35 (2), 259-265.
- Kamen-Siegal, L., Rodin, J., Seligman, M., & Dwyer, C. (1991). Explanatory style and cell mediated immunity. *Health psychology*, 10, 229-235.
- Katalan, L. (2003). *The sense of coherence and coping resources of HIV-positive adult females attending a support group*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Keil, C.P. (1998). Loneliness, stress and human-animal attachment among older adults. In C.C. Wilson, & D.C. Turner (Eds.), *Companion animals in human health* (pp.123-134). Thousand Oaks, CA: Sage Publications.
- Kelly, M., & Field, O. (1994). Comments on the rejection of the biomedical model in sociological discourse. *Medical Sociology News*, 19, 34-37.
- Kemeter, P., & Fiegl, J. (1998). Adjusting to life when assisted conception fails. *Human Reproduction*, 13(4), 1099-1105.

- Kerlinger, F.N. (1986). *Foundations of behavioral research*. London: Holt, Rinehart & Winston.
- Kessler, R.C., & Essex, M. (1982). Marital status and depression: The importance of coping resources. *Social Forces*, 6, 484-507.
- Kickbusch, I. (1996). Tribute to Aaron Antonovsky- 'What creates health'. *Health Promotion International*, 11, 5-6.
- Kiecolt-Glaser, J.K., & Glaser, R. (1989). Psychoneuroimmunology: Past, present, and future. *Health Psychology*, 8, 677-682.
- Kiecolt-Glaser, J.K., Marucha, P.T., Malarkey, W.B., Mercado, A.M., & Glaser, R. (1995). Slowing of wound healing by psychological stress. *Lancet*, 346, 1194-1196.
- Kirsten, A. (2003). *Psychofortology of female nurses at a managed health care private care hospital*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Klarreich, S.H. (1990). *The stress solution: How to be happier, healthier and more effective*. London: Cedar.
- Kleinke, C.L. (1991). *Coping with life challenges*. (2<sup>nd</sup> ed.). New York, NY: Brooks/Cole.
- Knoff, H.M. (1986). *The assessment of child and adolescence personality*. New York, NY: Guilford Press.
- Kobasa, S.C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology*, 37, 1-11.
- Koch, S. & Leary, D.E. (1985). *A century of psychology as science*. New York, NY: McGraw-Hill.
- Kraft, A.D., Palombo, J., Mitchell, D., Meyers, S., & Schmidt, A.W. (1980). The psychological dimensions of infertility. *American Journal of Orthopsychiatry*, 50, 618-627.
- Kruger, L. (2006). Motherhood. In T. Shefer, F. Boonzaier & P. Kiguwa (Eds.), *The gender of psychology*.
- Larsen, R. J., & Diener, E. (1984). Temporal stability and cross-situational consistency of affective, behavioural, and cognitive responses. *Journal of Personality and Social Psychology*, 47, 871-883.
- Larsen, U. (2005). Research on infertility: Which definition should we use? *Fertility and Sterility*, 83(4), 846-852.

- Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. New York: Springer.
- Lazarus, R.S. (2000). Toward better research on stress and coping. *American Psychologist*, *55*, 665-673.
- Lazarus, R.S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York:NY Springer.
- Ledger, W. (2002). In vitro fertilization. *Current Obstetrics and Gynaecology*, *12*, 269-275.
- Lee, T.Y., Sun, G.H., Chao, S.C., & Chen, C.C. (2000). Development of the Coping Scale for Couples. *Archives of Andrology* (*45*), 149-154.
- Leedy, P.D. (1989). *Practical research: Planning and design*. New York, NY: MacMillan.
- Leiblum, S.R. (Ed.). (1997a). *Infertility: Psychological issues and counselling strategies*. New York, NY: John Wiley and Sons.
- Leiblum, S.R. (1997b). Love, sex and infertility: The impact of infertility of on couples. In S.R. Leiblum (Ed.), *Infertility: Psychological issues and counselling strategies*. New York, NY: John Wiley and Sons.
- Leiblum, S.R., & Greenfeld, D.A. (1997). The course of infertility: Immediate and long-term reactions. In S.R. Leiblum (Ed.), *Infertility: Psychological issues and counselling strategies*. New York, NY: John Wiley and Sons.
- Levert, T., Lucas, M., & Ortlepp, K. (2000). Burnout in psychiatric nurses: Contributions of the work environment and a Sense of Coherence. *South African Journal of Psychology*, *30*(2), 36-41.
- Linley, P.A., & Harrington, S. (2005). Positive psychology and coaching psychology: Perspectives on integration. *The Coaching Psychologist*, *1*, 13-14.
- Linley, P.A., & Joseph, S. (2004). Toward a theoretical foundation for positive psychology in practice. In P.A. Linley & S. Joseph (Eds.), *Positive psychology in practice*. Hoboken, NJ: Wiley.
- Litt, M.D., Tennen, H., Affleck, G. & Klock, S. (1992). Coping and cognitive factors in adaptation to in vitro fertilization failure. *Journal of Behavioural Medicine*, *15*, 171-187.
- Lucas, R.E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology*, *71*, 616-628.

- Lucas, R. E., Diener, E., Grob, A., Suh, E. M., & Shao, L. (2000). Cross-cultural evidence for the fundamental evidence of extroversion. *Journal of Personality and Social Psychology*, *79*, 452-468.
- Madaras, L., & Madaras, A. (2007). *The "What's happening to my body?" book for boys*. New York, NY: New Market Press.
- Madhoo, K. (1999). *The sense of coherence and coping resources of patients in cardiac rehabilitation*. Unpublished Masters treatise. Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Mahlstedt, P.P. (1985). The psychological components of infertility. *Infertility and Sterility*, *43*, 335-346.
- Martin, E. (1989). *The woman in the body: A cultural analysis of reproduction*. Milton Keynes: Open University Press.
- Mason, E.J., & Bramble, W.L. (1989). *Understanding and conducting research*. (2<sup>nd</sup> ed.). New York, NY: McGraw-Hill.
- Mathiesen, K.S., Tambs, K., & Dalgard, O.S. (1999). The influence of social class, strain and social support on symptoms of anxiety and depression in mother's of toddlers. *Psychiatric Epidemiology*, *34*, 61-72.
- Matheny, K.B., Aycock, D.W., Pugh, J.L., Curlette, W.L., & Canella, K.A. (1986). Stress and coping: A qualitative and quantitative synthesis with implications for treatment. *The Counselling Psychologist*, *14*, 499-549.
- Matheny, K.B., Aycock, D.W., Curlette, W.L., & Junker, G.N. (1993). The coping resources inventory for stress: A measure of perceived resourcefulness. *Journal of Clinical Psychology*, *49*, 499-549.
- McGregor, I., & Little, B.R. (1998). Personal projects, happiness and meaning: On doing well and beyond yourself. *Journal of Personality and Social Psychology*, *74*, 494-512.
- McMahon, C., Ungerer, J., Tennant, C., & Saunders, D. (1997). Anxiety during pregnancy and foetal attachment after in-vitro fertilisation conception. *Human Reproduction*, *12*, 178-182.
- McShane, P.M. (1997). Infertility diagnosis and assisted reproductive options: a primer. In S.R. Leiblum. *Infertility: Psychological issues and counselling strategies*. New York, NY: John Wiley and Sons.

- McSherry, W., & Holm, J.E. (1994). Sense of coherence: Its effect on psychological and physiological processes prior to, during and after a stressful situation. *Journal of Clinical Psychology, 50*, 476-489.
- Meichenbaum, D. (1994). *A clinical handbook/practical therapist manual for assessing and treating adults with PTSD*. Ontario, Canada: Institute Press.
- Menning, B.E. (1980). The emotional needs of infertile couples. *Infertility and Sterility, 34*, 313-319.
- Metzger, D. A. (1998). A physician's perspective. *Infertility and involuntary childlessness: Helping couples to cope*. New York, NY: W.W. Norton.
- Michalos, A. C. (1985). Multiple discrepancies theory (MDT). *Social Indicators Research, 16*, 347-413.
- Mitchell, M.L., & Jolley, J.M. (2007). *Research design explained* (6<sup>th</sup> ed.). Belmont CA: Thomas Wadsworth.
- Mitchell, R.E., Cronkite, R.C., & Moos, R.H. (1983). Stress, coping and depression among married couples. *Journal of Abnormal Psychology, 92*, 433-448.
- Mouton, J., & Marais, H. (1994). *Basic concepts in the methodology of social sciences*. Pretoria, South Africa: Human Sciences Research Council.
- Myers, D. G. (1993). *The pursuit of happiness*. New York, NY: Avon.
- Myers, D.G., & Diener, E. (1995). Who is happy? *American Psychological Society, 6*(1), 10-19.
- Myers, D. G. (2000). The funds, friends, and faith of happy people. *American Psychologist, 55*(1), 56-67.
- Mokgathe, B.P., & Schoeman, J.B. (1998). Predictors of satisfaction with life: the role of racial identity, collective self-esteem and gender-role attitudes. *South African Journal of Psychology, 28*(1), 28-35.
- Møller, V. (1988). The relevance of personal domain satisfaction for the quality of life in South Africa. *South African Journal of Psychology, 18*, 69-75.
- Møller, V. (1996). Life satisfaction and expectations for the future in a sample of university students: a research note. *South African Journal of Sociology, 27*, 16-26.
- Monach, J.H. (1995). *Childless: no choice. The experience of involuntary childlessness*. London: Routledge.
- Monat, A., & Lazarus, R. (1977). *Stress and coping: An anthology*. New York, NY: Columbia University Press.

- Monga, M., Alexandrescu, B., Katz, S. E., Stein, M., & Ganiats, T. (2004). Impact of infertility on quality of life, marital adjustment, and sexual function. *Urology*, 63(1), 126-130.
- Moskowitz, D. S., & Cote, S. (1995). Do interpersonal traits predict affect? A comparison of three models. *Journal of Personality and Social Psychology*, 69, 915-924.
- Mouton, J. (1996). *Understanding social research* (4<sup>th</sup> ed.). New York, NY: McGraw-Hill.
- Mulhall, A. (1996). Cultural disclosure and the myth of stress in nursing and medicine. *International Journal of Nursing Studies*, 33(5), 455-468.
- Munnik, E. (1997). *Personal and social correlates of sense of coherence*. Unpublished Masters treatise, University of Pretoria, Pretoria, South Africa.
- Nettleton, S., & Gustafsson, U. (2002). *The sociology of health and illness reader*. Cambridge: Polity Press.
- Neuman, L. (1997). *Social research methods: Qualitative and quantitative approaches* (3<sup>rd</sup> ed.). Boston: Allyn & Bacon.
- Niven, C., & Carroll, D. (1993). Gender, health and stress. In C. Niven & D. Carroll (Eds.), *The health psychology of women*. Chur, Switzerland: Harwood Academic Publishers.
- Nolen-Hoeksema, S., & Rusting, C.L. (1999). Gender differences in well-being. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *The foundations of hedonistic psychology* (pp.330-352). New York, NY: Russell Sage Foundation.
- Oddens, B.J., den Tonkelaar, I., & Niewenhuyse, H. (1999). Psychosocial experience in women facing fertility problems-a comparative survey. *Human Reproduction*, 14, 48-53.
- Odendaal, N. (1999). *The subjective well-being of patients in cardiac rehabilitation*. Unpublished Masters dissertation, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Okun, M.A., Stock, W.A., Haring, M.J., & Witter, R.A. (1984). Correlates and components of subjective well-being among the elderly. *Journal of Applied Gerontology*, 6, 95-112.
- Olf, M. Brosschot, J.F., & Godaert, G. (1993). Coping styles and health. *Personality and Individual Differences*, 15, 81-90.



- Osche, R. (1984). Measuring global life-satisfaction in South African subjects. *South African Journal of Psychology, 14*, 60-63.
- Pajeris, F. (2001). Towards a positive psychology of academic motivation. *Journal of Education Research, 95*(1), 27-35.
- Palmer, S., & Dryden, W. (1995). *Counselling for stress problems*. London: Sage.
- Parker, R. (1997). The production and purposes of maternal ambivalence. In W.Holloway, & B. Featherstone (Eds.), *Mothering and ambivalence*. London: Routledge.
- Parker, J.D.A., & Endler, N.S. (1996). Coping and defence: A historical overview. In I.M. Ziedner, & N.S. Edler (Eds.), *Handbook of coping*. (pp.3-23). New York, NY: Wiley.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage.
- Paulson, J.D., Haarmann, B. S., Salerno, R. L., & Asmar, P. (1988). An investigation of the relationship between emotional maladjustment and infertility. *Fertility & Sterility, 49*(2), 258-262.
- Pavot, W., Diener, E., & Fujita, F. (1990). Extraversion and happiness. *Personality and Individual Differences, 11*, 1299-1306.
- Peterson, C. (1999). Personal control and well-being. In D. Kahneman, D. Diener, & N. Schwarz (Eds.). *Well-being: The Foundations of hedonic psychology* pp288-301. New York: Russell Sage Foundation.
- Peterson, C. (2000). The future of optimism. *American Psychologist, 55*(1), 44-55.
- Peterson, C., & Stunkard, A.J. (1989). Personal control and health promotion. *Social Science and Medicine, 28*, 819-828.
- Port Elizabeth Infertility and Wellness Clinic. (2004). *A.R.T. Artificial Reproductive Technology: Patients information*. Unpublished information document. Port Elizabeth.
- Pretorius, T.B. (1997). *Salutogenic resistance resources: The role of personal and environmental characteristics in stress-resistance*. Unpublished doctoral dissertation, University of the Free State, South Africa.
- Rapkin, B.D., & Fischer, K. (1992). Framing the construct of life satisfaction in terms of older adult's personal goals. *Psychology and Aging, 7*, 138-149.
- Reiss, H. (1998). *Reproductive medicine from A-Z*. London: Oxford University Press.
- Rice, P.L. (1992). *Stress and health* (2<sup>nd</sup> ed.). Belmont, CA: Brooks/Cole.

- Robins, L., & Regiers, D. (1991). *Psychiatric disorders in America*. New York, NY: Free Press.
- Robson, C. (2002). *Real world research* (2<sup>nd</sup> ed.). Oxford: Blackwell Publishing.
- Rogers, C. R. (1951). *Client-centered therapy: Its current practice, implications, and theory*. Boston, MA: Houghton Mifflin.
- Romano, J. L. (1992). Psychoeducation interventions for stress management and well-being. *Journal of Counselling and Development*, 71, 199-202.
- Rosenfeld, D.L., & Mitchell, E. (1979). Treating the emotional aspects of infertility: Counseling services in an infertility clinic. *American Journal of Obstetrics and Gynecology*, 135, 177-180.
- Rothbaum, E., Weisz, J.R., & Snyder, S.S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, 42, 5-27.
- Rotter, J.B. (1966). Generalised expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 81(1), 1-28.
- Rowe, P. J., Comhaire, F. H., Hargreave, T. B., & Mellows, H. J. (1993). *WHO manual for the standard investigation and diagnosis of the infertile couple*. Cambridge: Cambridge University Press.
- Rusting, C.L., & Larsen, R. J. (1998). Personality and cognitive processing of affective information. *Personality and Social Psychology Bulletin*, 24(2), 200-213.
- Ryan, R.M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality*, 65, 529-565.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Ryff, C.D. (1995). Psychological well-being in adult life. *Current Directions in Psychological Science*, 4(4), 99-104.
- Sadler, A.G., & Syrop, C.H. (1987). The stress of infertility: Recommendations for assessment and intervention. In J.C. Hansen, & D. Rosenthal (Eds.), *Family stress* (pp.1-17). Rockville, MD: Aspen.
- Sagy, S., Antonovsky, A. & Adler, I. (1990). Explaining life satisfaction in later life: The sense of coherence model and activity theory. *Behaviour, Health and Aging*, 1, 11-21.

- Saleebey, D. (Ed.). (1997). *The strengths perspective in social work practice* (2<sup>nd</sup> ed.). New York, NY: Longman.
- Salkind, N.J (1997). *Exploring research* (3<sup>rd</sup> ed.). Upper Saddle River, NJ: Prentice-Hall.
- Salovey, P., Rothman, A. J., Detweiler, J.B., Steward, W. T. (2000). Emotional states and physical health. *American Psychologist*, 55(1), 110-121.
- Sarafino, E. P. (1990). *Health psychology: Biopsychosocial interactions* (1<sup>st</sup> ed.). New York, NY: Free Press.
- Sarafino, E.P. (2002). *Health psychology: Biopsychosocial interactions* (4<sup>th</sup> ed.). New York, NY: John Wiley & Sons.
- Sarason, B.R., Sarason, I.G., & Pierce, G.R. (Eds.), (1990). *Social support: An interactional view*. New York, NY: John Wiley.
- Schaefer, J.A., & Moos, R.H. (1992). Life crises and personal growth. In B.N. Carpenter (Ed.), *Personal coping theory, research and application*. Westport, CT: Praeger.
- Schafer, W. (2000). *Stress management for wellness* (4<sup>th</sup> ed.). Belmont, CA: Thomas Wadsworth.
- Scheier, M.F., & Carver, C.S. (1987) Dispositional optimism and physical well-being: The influence of generalized outcome expectancies on health. *Journal of Personality*, 55, 169-210.
- Schneider, S. (2001). In search of realistic optimism: Meaning, knowledge and warm fuzziness. *Journal of American Psychologist*, 54(3), 250-263.
- Schwellnus, I. (2001). *The psychosocial adjustment and sense of coherence of adolescents in a children's home*. Unpublished Honours treatise, Nelson Mandela Metropolitan University in the Department of Psychology, Port Elizabeth, South Africa.
- Seeman, J. (1989). Toward a model of positive health. *American Psychologist*, 44, 1099-1109.
- Seegerstrom, S., Taylor, S., Kemeny, M., & Fahey, J. (1998). Optimism is associated with mood, coping, and immune change in response to stress. *Journal of Personality and Social Psychology*, 74, 1646-1655.
- Seidlitz, L., & Diener, E. (1993). Memory for positive versus negative life events: Theories for the differences between happy and unhappy persons. *Journal of Personality and Social Psychology*, 64(4), 654-664.

- Seligman, M. (1998). Building human strength: Psychology's forgotten mission. *American Psychological Association, 29*, 1-2.
- Seligman, M.E.P. (2002). *Authentic happiness*. New York: Free Press.
- Seligman, M.E.P. (2006) *Learned Optimism: How to change your life*. Vintage: USA.
- Seligman, M., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5-15.
- Seligman, M., & Steen, T.A. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 5*, 410-421.
- Selye, H. (1976). *The stress of life*. New York, NY: Lippincott.
- Selye, H. (1982). History and present status of the stress concept. In L. Goldberg, & S. Bernitz (Eds.), *Handbook of stress: Theoretical and clinical aspects*. New York, NY: Free Press.
- Shafer, W. (1996). *Stress management for wellness* (3<sup>rd</sup> ed.). Fort Worth State: Harcourt Brace.
- Shefer, T., Boonzaier, F., Kiguwa, P. (Eds.) (2006). *The Gender of Psychology*. Cape Town: University of Cape Town Press.
- Sheiner, E.K., Shiener, E., Carel, R., Potashnik, G., & Shoham- Vardi, I. (2003). The relationship between occupational psychological stress and female fertility. *Occupational Medicine, 53*, 265-269.
- Sheldon, K.M., & King, L. (2001). Why positive psychology is necessary. *American Psychologist, 56*(3), 216-217.
- Sheridan, C. L., & Radmacher, S. A. (1992). *Health Psychology*. New York, NY: Wiley.
- Siegel, M. (1993). Smoking and leukaemia: Evaluation of a causal hypothesis. *American Journal of Epidemiology, 138*, 1-9.
- Sigelman, L. (1981). Is ignorance bliss? A reconsideration of folk wisdom. *Human Relations, 43*, 965-974.
- Smith, R. (1997). *The human sciences*. NY: Norton.
- Smith, G. (2006). *The psychofortology of post-graduate learners in the Faculty of Health Sciences at Nelson Mandela University*. Unpublished Masters treatise. Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Snyder, C.R., & Lopez, S.J. (2005). *Handbook of positive psychology*. New York, NY: Oxford University Press.

- Solberg, E. C., Diener, E., Wirtz, D., Lucas, R. E., & Oishi, S. (2002). Wanting, having, and satisfaction: Examining the role of desire discrepancies in satisfaction with income. *Journal of Personality and Social Psychology*, 83(3), 725-734.
- Stacey, M. (1988). *The sociology of health and healing*. London: Unwin Hyman.
- Stanton, A.L., & Dunkel-Schetter, C. (1991). *Infertility: Perspectives form stress and coping research*. New York: Plenum Press.
- Steel, P., & Ones, D.S. (2002). Personality and happiness: A national-level analysis. *Journal of Personality and Social Psychology*, 83, 767-781.
- Stock, W.A., Okun, M.A., Haring, M.J., & Witter, R.A. (1985). Race and subjective well-being in adulthood. *Human Development*, 28, 192-197.
- Stone, G.C. (1987). The scope of health psychology. In G.C. Stone, S.M. Weiss, J.D. Matarazzo, N.E. Miller, J. Rodin, C.D. Belar, M.J. Follick, & J.E. Singer (Eds.), *Health psychology: A discipline and a profession* (pp.513-524). Chigaco, Il: Chicago University Press.
- Stones, M. J., & Kozma, A. (1985). Structural relationships among happiness scales: A second order factorial study. *Social Indicators Research*, 17,19-28.
- Stoppard, M. (2001). *Women's health handbook*. London: Dorling Kindersley Press.
- Strack, F., Argyle, M., & Schwarz, N. (1991). *Subjective well-being: An interdisciplinary approach perspective*. Oxford: Pergamon Press.
- Strang, S. & Strang, P. (2001). Spiritual thoughts, coping and sense of coherence in tumour patients and their spouses. *Palliative Medicine*, 15, 127-134.
- Strümpfer, D.J.W. (1990). Salutogenesis: A new paradigm. *South African Journal of Psychology*, 20(4), 265-276.
- Strümpfer, D.J.W. (1993). Salutogenesis: A new paradigm. In N. Manganyi, H.C. Marais, K.F. Mauer, & R.J. Prinsloo (Eds.), *A dissident among patriots* (pp.158-186). Pretoria: HSRC.
- Strümpfer, D.J.W. (1995). The origins of health and strength: from 'salutogenesis' to 'fortigenesis'. *South African Journal of Psychology*, 25(2), 81-89.
- Strümpfer, D.J.W. (2001). Psychofortology: Review of a new paradigm marching on. *Psychofortology* (in press). Available on <http://general.rau.ac.za/psych>.
- Strümpfer, D.J.W. (2005). "Standing on the shoulders of giants: Notes on early positive psychology (psychofortology). *South African Journal of Psychology*, 25, 81-89.

- Struwig, F.W., & Stead, G.B. (2001). *Planning, designing and reporting research*. Cape Town: Maskew Miller Longman.
- Suh, E., Diener, E., & Fujita, F. (1996). Events and subjective well-being: Only recent events matter. *Journal of Personality and Social Psychology*, 70, 1091-1102.
- Suls, J., & Fletcher, B. (1985). The relative efficacy of avoidant and nonavoidant coping strategies: A meta-analysis. *Health Psychology*, 4, 249-288.
- Suominen, S., Blumberg, H., Helenius, H., & Koskenvuo, M. (1999). Sense of coherence and health: Does the association depend on resistance resources? *Psychology and Health*, 14, 937-948.
- Super, D.E. (1955). Transition: From vocational guidance to counselling psychology. *Journal of Counseling Psychology*, 2, 3-9.
- Sutherland, V.J., & Cooper, C.L. (1990). *Understanding stress: A psychological perspective for health professionals*. London: Chapman & Hall.
- Swartz, L. (2003). Fertility transition in South Africa and its impact on the four major population groups. In Department of Social Development, *Fertility: Current South African issues of poverty, HIV/AIDS & Youth*. HSRC Press, Cape Town.
- Taggart, L.A.P. (1997). Relationships among affiliation with companion animals, attachment style, depression, loneliness, satisfaction with life, and self-esteem: Implications for human candidate selection for adjunctive use of companion animals. *Dissertation Abstracts International: The Sciences and Engineering*, 57, 6637.
- Taylor, S.E., & Brown, J.D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193-210.
- Taylor, S.E., Peplau, L.A., & Sears, D.O. (1997). *Social Psychology* (9<sup>th</sup> ed.). Upper Saddle River, New Jersey: Prentice Hall.
- Tedeschi, R.G., & Calhoun, L.G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage Publications.
- Thiering, P., Beaurepaire, J., Jones, M., Saunders, D., & Tennant, C. (1993). Mood state as a predictor of treatment outcome after in vitro fertilisation/embryo transfer technology (IVF/ET). *Journal of Psychosomatic Research*, 37, 481-491.
- Thyer, B.A. (1993). Single-system research design. In Grinnert, R. M. (Ed.), *Social work research evaluation* (4<sup>th</sup> ed.). Itasca, IL: Peacock.
- Tortora, G.J., & Grabowski, S.R. (1996). *Principles of anatomy and physiology*. (8<sup>th</sup> ed.). New York, NY: Harper Collins.

- Tortora, G.J., & Grabowski, S.R. (2003). *Principles of anatomy and physiology* (9<sup>th</sup> ed.) New York, NY: Harper Collins.
- Uchino, B. N., Cacioppo, J.T., & Kiecolt-Glaser, J.K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin*, 119(3), 488-531.
- Van der Merwe, A. (2001). *Health and happiness: The way to wellness for mind, body and soul*. Cape Town, Tafelberg.
- Van Lill, J.B., & Grieve, K.W. (1994). *Descriptive statistics for students in the human sciences*. Pretoria: Sigma Press.
- Van Niekerk, E., van Eeden, C., & Botha, K. (2000). Reflections on psychological strengths and vulnerabilities. In E. van Niekerk, & A. Prins (Eds.), *Counselling in South Africa: A youth perspective*. Cape Town, Tafelberg.
- Veenhoven, R. (1991). Questions on happiness: Classical topics, modern answers, blind spots. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being: An interdisciplinary perspective*. Oxford: Pergamon Press.
- Veenhoven, R. (1994). Is happiness a trait? Tests of the theory that a better society does not make people happier. *Social Indicators Research*, 32, 101-160.
- Viney, L.L. (1986). Expression of positive emotion by people who are physically ill: Is it evidence of defending or coping? *Journal of Psychosomatic Research*, 32, 27-34.
- Vorster, R. (2002). *The subjective well-being and purpose in life of the retired elderly in a Port Elizabeth residence for the aged*. Unpublished Masters treatise, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Walker, W. R., Skowronski, J.J., & Thompson, C.P. (2003). Life is pleasant- and memory helps to keep it that way! *Review of General Psychology*, 7(2), 203-210.
- Walsh, R. (2001). Positive psychology: East and West. *American Psychologist*, 56, 83.
- Warr, P. (1999). Well-being and the workplace. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundation of hedonic psychology* (pp.392-412). New York, NY: Russell Sage Foundation.
- Watson, D. (2002). Positive affectivity: The disposition to experience pleasurable emotional states. In C.R. Snyder, & S.J. Lopez (Eds.), *Handbook of Positive Psychology*. (pp. 106-119). New York, NY: Oxford University Press.

- Watson, D., & Clark, L.A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp.767-793). San Diego, CA: Academic.
- Watten, R. G., Syversen, J.F., & Myhrer, T. (1995). Quality of life, intelligence, and mood. *Social Indicators Research*, 36, 287-299.
- Watten, R.G., Vassend, D., Myhrer, T., & Syversen, J.L. (1997). Personality factors and somatic symptoms. *European Journal of Personality*, 11, 57-68.
- Weisenberg, M., Raz, T., & Hener, T. (1998). The influence of film induced mood on pain perception. *Pain*, 76, 365-375.
- Weiten, W., Lloyd, M.A., & Lashley, R.L. (1991). *Psychology applied to modern life: Adjustment in the 1990's* (3<sup>rd</sup> ed.). Pacific Grove, CA: Brooks-Cole.
- West, S. (1983). Infertility- Couples in crisis. *The Australian Nurses Journal*, 13, 40-41.
- Wilson, W. (1967). Correlates of avowed happiness. *Psychological Bulletin*, 67, 294-306.
- White, R.B. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.
- Whitworth, B. (1996). *The natural way: Infertility*. Dorset: Element Books.
- Winter, L., Lawton, M.P., Casten, R.J., & Sando, R.L. (1999). The relationship between external events and affect states in older people. *International Journal of Human Development and Aging*, 50, 1-12.
- Wissing, M.P., & Van Eeden, C. (1997). *Psychological well-being: A fortigenic conceptualization and empirical clarification*. Paper presented at the 3<sup>rd</sup> Annual Congress of the Psychological Society of South Africa, Durban, South Africa.
- Witmer, J.M., & Sweeney, T.J. (1992). A holistic model for wellness and prevention over the life span. *Journal of Counselling and Development*, 71, 140-148.
- Woods, J.V. (1996). What is social comparison and how should we study it? *Personality and Social Psychology Bulletin*, 22, 520-537.
- Wolff, A.C., & Ratner, P.A. (1999). Stress, social support and sense of coherence. *Western Journal of Nursing Research*, 21, 182-198.
- World Health Organisation (1948). *Psychosocial factors and health: Monitoring the psychosocial work environment and workers' health*. Geneva: WHO.



Wright, J., Allard, M., Lecours, A., & Sebourin, S. (1991). Psychosocial distress and infertility: a review of controlled research. *International Journal of Infertility*, 34, 126-142.

Appendix A  
Information Letter to the Participants

PSYCHOFORTOLOGY OF WOMEN UNDERGOING INFERTILITY  
TREATMENT IN MANAGED HEALTH CARE

Dear Participant

I am currently completing my Masters degree in Clinical Psychology at the Nelson Mandela Metropolitan University and need to complete a research treatise as part of the requirements for the degree. A literature review has indicated that while some research has been done on the depression and anxiety associated with the experience of infertility, there is a gap in the literature concerning the strengths of the individual or what resources and processes the individual uses to cope with the experience.

The aim of his research is to explore and describe the coping resources, sense of coherence, satisfaction with life and happiness of women undergoing infertility treatment. The study is aimed at identifying strengths and resources available to individuals who are exposed to particularly stressful and challenging circumstances and how these resources can contribute to the enhancement of the individual's psychological well-being.

Participation in this research requests of you to complete a biographical questionnaire and four other questionnaires aimed at identifying the ways in which you cope with life stressors, your general satisfaction with life and your levels of happiness. The completion of these questionnaires will take approximately 45 minutes to an hour.

Your participation in this study is completely voluntary, and you have the right to withdraw at any time. Confidentiality and anonymity will be maintained at all times and especially in the analysis of data and the completion of the treatise.

A summary report will be provided to the research co-ordinator at the Port Elizabeth Infertility and Wellness Unit, but should you wish to receive individual feedback, kindly fill in your name in the space provided on the biographical questionnaire. Written individual feedback will be provided in the form of a brief report.

For further information or any enquiries, please do not hesitate to contact me at 041 452 7915 (h) or 073 122 9904.

Your cooperation and participation is valued and appreciated.

Kind regards

**Ms. Kerry Phillips**  
**(Researcher)**

**Dr. J.P. Fouche**  
**(Supervisor)**

**Dr. L. Stroud**  
**(Supervisor)**

Appendix B  
Consent Form

## Consent Form

### INFORMATION AND INFORMED CONSENT FORM

TITLE OF THE RESEARCH PROJECT: **THE PSYCHOFORTOLOGY OF WOMEN UNDERGOING INFERTILITY TREATMENT AT A PRIVATELY MANAGED HEALTH CARE UNIT**  
 PRINCIPAL INVESTIGATOR: **KERRY PHILLIPS**

SUPERVISOR: **DR. PAUL FOUCHÉ AND DR. LOUISE STROUD**

ADDRESS: **DEPT OF PSYCHOLOGY: P.O. BOX 77000, NMMU, 6013**

CONTACT TELEPHONE NO.: **041 452 7915/ 0731229904**

<p>DECLARATION BY OR ON BEHALF OF PARTICIPANT:</p> <p>I, THE UNDERSIGNED,.....(name)</p> <p>[I.D. No:.....], a participant in the abovementioned research project,  of .....  .....(address).</p> <p><b>A. HEREBY CONFIRM AS FOLLOWS:</b></p> <p>1. I/The participant was invited to participate in the abovementioned research project which is being undertaken by Kerry Phillips of the Department of Psychology in the Faculty of Health Sciences at the Nelson Mandela Metropolitan University.</p>	<p><b>Initial</b></p>
<p>2. The following aspects have been explained to me:</p> <p>Aim: The investigator aims to explore and describe the Coping Resources, Sense of Coherence, Satisfaction with Life and Happiness of women undergoing infertility treatment at a privately managed health care unit.</p> <p>The information may be used in the development of counseling and support groups for women experiencing infertility and infertility treatment at managed health care facilities.</p>	<p><b>Initial</b></p>
<p>Procedures: I understand that I will be asked to complete four standardized questionnaires and a biographical questionnaire.</p>	<p><b>Initial</b></p>
<p>Risks: I am aware that I cannot enter into a therapeutic relationship with the investigator. Should I experience distress during the process of completing the questionnaires, I understand that it is in my best interests and to my benefit to seek psychological help and counseling.</p>	<p><b>Initial</b></p>

Possible benefits: Should I request individual feedback, I may receive new insight into my experience. The information may be useful in the development of counseling and treatment programmes for women experiencing infertility and infertility treatment.	<u>Initial</u>
Confidentiality: My identity will not be revealed in any discussion, description or scientific publications by the investigators.	<u>Initial</u>
Access to findings: Any new information / or benefit that develops during the course of the study will be shared with me via a written report.	<u>Initial</u>
Voluntary participation / refusal / discontinuation: My participation is voluntary. My decision whether or not to participate will in no way affect my present or future employment.	<u>Initial</u>
3. The information above was explained to me / the participant by Kerry Phillips in English/ Afrikaans. And I am in command of this language. I was given the opportunity to ask questions and all these questions were answered satisfactorily.	<u>Initial</u>
4. No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalization.	<u>Initial</u>
4. Participation in this study will not result in any additional cost to myself.	<u>Initial</u>
<p><b>B. I HEREBY CONSENT VOLUNTARILY TO PARTICIPATE IN THE ABOVEMENTIONED PROJECT.</b></p> <p>Signed / confirmed at ..... on ..... 20...</p> <p style="text-align: center;">(place) (date)</p> <p>..... Signature or right thumb print of participant</p> <p>..... Signature of witness</p>	

Appendix C  
Biographical Questionnaire

**CONFIDENTIAL****BIOGRAPHICAL QUESTIONNAIRE**

Please provide your particulars in the appropriate space provided or mark with an (X) in the block that contains the information applicable to you.

1. Age (in completed years) \_\_\_\_\_

2. Date of Birth:

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
 (Year) (Month) (Day)

3. Home Language

English	Afrikaans	Xhosa	Other
---------	-----------	-------	-------

If Other, please specify \_\_\_\_\_

4. Employment Status

Employed	Unemployed
----------	------------

If employed, please specify your job description \_\_\_\_\_

5. If applicable, please specify the medical reason associated with the infertility.

\_\_\_\_\_

6. If applicable, please indicate if you have been treated for a psychiatric condition (e.g. major depression, anxiety disorders etc). Please provide the name/ type of condition.

\_\_\_\_\_



7. If applicable, please indicate when this condition was experienced.

Currently (within the past 5 months)	At least 6 months ago	At least 12 months ago	More than a year ago	More than 2 years ago
---	--------------------------	---------------------------	-------------------------	--------------------------

8. How long have you received treatment for infertility?

Currently (for the past 5 months)	For at least 6 months	For at least 12 months	For more than a year	For more than 2 years
---	--------------------------	---------------------------	-------------------------	--------------------------

9. In which methods of Alternative Reproductive Technology programmes have you participated? (e.g. IVF or GIFT).

---

If you would like written feedback of your results, kindly fill in your details below.

The researcher will ensure that strict confidentiality of all information will be maintained.

\_\_\_\_\_ (Name and Surname)

\_\_\_\_\_ (Contact Telephone Number)

Appendix D  
Glossary of Medical Terms

## Glossary of Medical Terms<sup>5</sup>

<b>Assisted Reproductive Technology (ART)</b>	The collective name for all artificial techniques used to assist conception.
<b>Atresia</b>	The degeneration and reabsorption of an ovarian follicle before it fully matures and ruptures.
<b>Azoospermia</b>	The absence of sperm in male ejaculate.
<b>Cervical mucous</b>	Secretions in the cervical canal, which alter in consistency during ovulation.
<b>Cervix</b>	The narrow neck at the lower end of the uterus or womb that joins the vagina.
<b>Corpus luteum</b>	A yellow gland in the ovary formed when a follicle has released its oocyte.
<b>Egg/ oocyte</b>	The female gamete released during each monthly menstrual cycle.
<b>Egg collection</b>	The process whereby the egg cells are collected from a woman's ovary using either a laparoscope or an ultrasound guided needle.
<b>Donor insemination</b>	The introduction of donor sperm into the cervix of the womb.
<b>Embryo</b>	A fertilised egg cell that has the potential to develop into a foetus.
<b>Embryo transfer</b>	The transfer of embryos into the female patient.
<b>Endometriosis</b>	A female condition in which parts of the lining inside the womb (endometrium) grow outside of the womb, leading to

---

<sup>5</sup> **Source:** Dooley, M. (2006);Tortora, G.J., & Grabowski, S.R. (2003).

	pain during intercourse and possible infertility.
<b>Endometrium</b>	The lining of the womb, which sheds during menstruation and which supports a foetus when pregnancy occurs.
<b>Fallopian tube(s)</b>	The tube where the egg and sperm meet that connects the testes to the vas deferens and through which sperm travels.
<b>Fertilisation</b>	The penetration of an egg by a sperm resulting in the formation of an embryo.
<b>Foetus</b>	The term given to an embryo after eight weeks of development up until birth.
<b>Follicle</b>	A small, sac-like structure in the ovary in which the egg develops.
<b>Follicle-stimulating Hormone (FSH)</b>	A hormone released by the pituitary gland that stimulates follicle production. It is also used in assisted conception to stimulate the production of several follicles.
<b>Gamete</b>	Male sperm or female egg cell.
<b>Gamete intra-fallopian transfer (GIFT)</b>	An assisted conception procedure in which eggs are retrieved, mixed with sperm and then placed back into the fallopian tube for fertilisation to occur.
<b>Human chorionic gonadotropin (hGC)</b>	The presence of this hormone in female blood or urine indicates a pregnancy.
<b>Insemination</b>	The artificial placing of a sperm in the female reproduction tract.
<b>Intra-cytoplasmic sperm injection (ICSI)</b>	A procedure in which a single sperm is injected into an egg.
<b>Intrauterine insemination (IUI)</b>	Insemination of sperm into the woman's uterus.

<b>In vitro fertilisation</b>	Process in which the eggs and sperm are mixed together in the laboratory. Any embryos that develop are then transferred into the female or frozen for future use.
<b>Laparoscopy</b>	An internal examination of the pelvic and abdominal organs using a telescope. Usually carried out under general anaesthetic.
<b>Luteinising hormone (LH)</b>	Hormone released by the pituitary gland that is essential for egg cell and sperm development.
<b>Menstrual cycle</b>	A woman's monthly cycle where an egg is released from the ovary, the lining of the womb develops and then sheds via the vagina, unless pregnancy occurs.
<b>Oestrogen</b>	A group of female hormones produced by the ovaries. The levels of this hormone change during the menstrual cycle.
<b>Oligozoospermia</b>	Low sperm count.
<b>Oocyte</b>	The female egg cell/gamete.
<b>Ovary</b>	The female reproductive organ that contains and releases eggs.
<b>Ovulation</b>	The monthly release of an egg.
<b>Polycystic ovarian syndrome (PCOS)</b>	A condition where ovaries increase slightly in size with small cysts. This may result in irregular periods, infertility, excessive hair growth, acne or obesity.
<b>Progesterone</b>	A hormone produced by the ovary and corpus luteum after ovulation to encourage the growth of the lining of the uterus.
<b>Prostate Gland</b>	The male gland that secretes a solution that makes up the major part of the

<b>Sperm</b>	ejaculate. Male gametes. A single sperm is called a spermatozoon.
<b>Testis</b>	A testicle or male gonad.
<b>Treatment cycle</b>	One complete treatment. The cycle begins with the administration of drugs or first insemination.
<b>Uterus</b>	The womb, where the embryo develops.
<b>Zona pellucida</b>	The membrane surrounding the female's egg

Dooley, M. (2006). *Fit for fertility: Overcoming infertility and preparing for pregnancy*. London: Hodder Mobius.

Tortora, G.J., & Grabowski, S.R. (2003). *Principles of anatomy and physiology*. (9<sup>th</sup> ed.) New York: Harper Collins.