

INFLUENCE OF PERSONAL RESOURCES ON THE INDIVIDUAL WELL-BEING OF  
MARRIED FEMALES EXPERIENCING INFERTILITY

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL  
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2010

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To my Mama, Rita “Dee” Fabisiak, for providing a constant example of strength, resilience  
and unconditional love that has allowed me to fulfill this dream.  
You are in my heart always.

## ACKNOWLEDGMENTS

I would first like to thank the amazing women who took the time to complete my survey and lend their wisdom to the fields of counseling and infertility. I would also like to thank the University of Florida and the Gator Nation for providing me with over a decade of priceless experience, both personal and academic.

Next, I would like to thank my committee members for their commitment to me and to my work throughout my studies at the University of Florida. I would like to thank my chair, Dr. Ellen Amatea, for her incredible support, guidance, and understanding throughout my graduate career, which I truly cherish. I never could have done this without her. I would also like to thank Dr. Peter Sherrard for being a tremendous mentor to me and unknowingly instilling confidence in abilities I never knew I had. I thank Dr. Silvia Doan for her encouragement through this process and for her trust in my work with the Family Clinic. I also thank Dr. Suzanna Smith, with whom I have had the longest professional relationship at UF, for helping me to choose this career path through her inspiring teachings.

My colleagues, friends, and family members have provided me with endless support throughout my studies and have believed in me and encouraged me through the ups and downs. I thank Betsy Pearman, for her endless knowledge and tireless efforts to make this process bearable. To my “treasured trio”: Jaime Jasser, Teresa Leibforth, and Kelcey Killingsworth, no words can describe the love and respect I have for each of you. You have been there through every step providing knowledge, encouragement, accountability, and, of course, a great deal of fun. To Christy Akly Siddiqui, you have been my best friend for over 10 years and I am so lucky to have you in my life. Thank you for being the “sister” I never had, for your constant listening ear, and of course, for providing me with a fabulous place to stay on every trip to Gainesville.

I must thank my parents, Laura-Lee and Dennis Hanney, for their never-ending love and support. I thank my mother for providing me with an example of unmatched strength, passion, perseverance, and unconditional love. She is the most amazing woman I have ever known. I thank my father for showing me the importance of achievement and determination and for being there for all of the “big moments” as well as for our little talks. I only wish everyone could be as lucky to have such wonderful parents.

Most importantly, I would like to thank my husband and best friend, Brian Rask. Though he never anticipated the length or difficulty of this journey, he loved and supported me through every aspect of the process. I am eternally grateful for his constant love, sensitivity, and truly unique sense of humor that kept me balanced each and every day.

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## DEFINITION OF TERMS

<i>Avoidance</i> oriented coping	Refers to the mental changes made and activities designed to avoid stressful situations (Endler & Parker, 1999).
Assisted Reproductive Technologies	(ART) Comprises the newest area of infertility treatment and generally refers to a treatment for infertility in which both sperm and egg are removed from each partner to attempt fertilization (Hart, 2002).
Coping	The ever-changing cognitive and behavioral attempts to control the external and/or internal demands perceived as strenuous or beyond the control of the individual (Lazarus & Folkman, 1987).
Crisis	Refers to a state of instability and disorganization in which coping strategies used in the past are ineffective (Slaikeu, 1990).
<i>Emotion</i> oriented coping	A response thought to be successful or unsuccessful in reducing stress oriented toward self (Endler & Parker, 1999).
High tech methods	Higher-cost more invasive treatments for infertility. These methods are also known as Assisted Reproductive Technology (ART) (Williams, 2000).
Individual well-being	The self perceptions and level of stress and strain experienced by an individual (Gladding, 2001).
In vitro fertilization	(IVF) An embryo transfer procedure in which the egg is fertilized by the sperm outside of the body in a laboratory dish. Once the egg is fertilized, it is implanted directly into the uterus to further develop (American Society for Reproductive Medicine, 2003).
Infertility	The inability of a woman to achieve conception after a year of unprotected intercourse (Hart, 2002).
Low technology methods	Treatments for infertility that are generally lower in cost and do not involve surgery. Often included in this category are fertility drugs for women and men, artificial insemination and donor insemination (Williams, 2000).

Marital satisfaction	A mental state reflecting the individual perceived benefits versus perceived costs of marriage. When benefits outweigh costs, a higher degree of satisfaction exists (Shackelford & Buss, 2000).
Primary infertility	The inability to have ever achieved conception or carried a pregnancy to term (Doherty & Clark, 2002).
Secondary infertility	The inability to conceive after having carried at least one pregnancy to term in the past (Doherty & Clark, 2002).
Stage of infertility treatment	The number of treatments a woman or couple has used in an attempt to conceive.
<i>Task oriented coping</i>	The emphasis on tasks and using planning or deliberateness in addressing problems (Endler & Parker, 1999).

Abstract of Dissertation Presented to the Graduate School  
of the University of Florida in Partial Fulfillment of the  
Requirements for the Degree of Doctor of Philosophy

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December 2010

Chair: Ellen Amatea

Major: Marriage and Family Counseling

The purpose of the study was to examine the contribution of women's use of three styles of coping, marital satisfaction, use of 3 infertility-specific coping strategies, age, and number of treatments in predicting the individual well-being of married females currently being treated for infertility. A secondary purpose was to identify whether there were differences in coping processes, marital satisfaction, infertility-specific coping strategies, and individual well-being for women of different age groups and number of treatment groups. The study was grounded in Crisis Theory, Transactional Theory of Stress and Coping, and the Developmental Theory of Infertility. A total of 282 women took part in an online survey. No participants elected to complete the paper-based version of the survey. The survey consisted of 4 measures and a demographic questionnaire including the *Coping Inventory for Stressful Situations (CISS)*, the *Index of Marital Satisfaction (IMS)*, the *Mental Health Inventory-5 (MHI-5)*, and the *Coping Scale for Infertile Couples (CSIC)*.

The data was analyzed using a 3 x 3 factorial MANOVA, a 3 x 3 factorial ANOVA and stepwise regression. Results of the MANOVA indicated there was no interaction or main effect for the multivariate combined variable. The factorial ANOVA found an interaction between age group and number of treatments group for the subscales of *Emotion (CISS)* and *Space (CSIC)*

subscales. Stepwise regression found the subscales of *Emotion*, *Avoidance*, *Space*, *Task*, and *IMS score* scores were significant predictors of individual well-being. Findings suggest women between the ages of 30 and 33 had the highest scores on the subscales of *Emotion* and *Space* in coping with infertility. Findings also suggested the scores on the subscales of *Emotion*, *Avoidance*, *IMS*, *Space*, and *Task* may be used as predictors of individual well-being. *Avoidance* and *Task* were found to be negative predictors of well-being while *Emotion*, high marital satisfaction and *Space* were found to be positive predictors of individual well-being. The results of the study are presented, limitations addressed, and the implications for theory, counseling practice, and future research are discussed.

## CHAPTER 1

### INTRODUCTION

*Lisa was crying as she left her physician's office for the last time. She had left her house this morning hoping to conceive a child through in vitro fertilization. She had spent the past 5 years using a variety of means to conceive and had also spent thousands of dollars in the process. Lisa and her husband came from large families with many siblings and were hoping to raise a large family of their own. They had come to a point at which they felt drained and hopeless. The energy and money they have put into Lisa's fertility treatments have put a strain on her, their marriage, and her mental health. In addition to the disappointment of failed attempts to conceive, she is constantly tired, experiences frequent mood swings, and has considerable pain from the daily shots she must take. She doesn't want to give up on the dream she and her husband have of starting a family, but she doesn't know how much more of this she can take.*

This scenario illustrates many of the challenges faced by women experiencing infertility.

The process of fertility treatment can be a difficult struggle not only for a woman, but also for her partner. Women can anticipate a time period during treatment where consistent motivation and patience are greatly needed. However, most women are not prepared for the possibility of enduring years of attempts, a variety of treatment methods, and in many cases, an unsuccessful outcome (Salakos, Roupa, Sotiropoulou & Grigoriou, 2004). Moreover, women may be unaware of the effects these treatments may have on their individual well-being and on the quality of their marital relationship. Typical reactions to infertility and treatment may include guilt, anxiety, depression, isolation and relationship strain (Hart, 2002).

Often infertility is the first major crisis a woman faces in her marital relationship, and constitutes the first true test of the strength of the relationship (Eunpu, 1995). How do women cope with the stress of infertility and infertility treatment without jeopardizing their relationship satisfaction? Many women feel a loss of control over their lives during this period (Mazor & Simons, 1984). Women may question their individual goals and expectations as well as their role within their marital relationship (Corson, 1999). They doubt their previous perspectives on life and how this problem will affect them in the future (Hart, 2002). They may feel distance

from their partner as well as isolation from their social support system (Imeson & McMurray, 1996). In addition, researchers have reported significant differences between men's and women's emotional responses to infertility. If these differences are not addressed, they may create sources of conflict between marital partners during this period (Merari, Chetrit, & Modan, 2002).

Although women regularly face issues of infertility, researchers have not focused on the treatment experience of females and its impact on the marital relationship. Instead, most researchers have examined the physical health of women experiencing infertility and infertility treatment or their emotional responses to this process (Peterson, Newton, & Rosen, 2003).

In many cases, women in long-term relationships have been exposed to various stressors and struggles. They have discovered ways to cope with these challenges and have developed the necessary skills to do so (Eunpu, 1995). These coping skills are dramatically tested during the period of infertility and it is imperative for each woman to either strengthen existing skills or develop new, more effective ways of coping with the stress of infertility (Leiblum, 1997). In this study, the impact of women's marital satisfaction, individual coping style, and infertility-specific coping strategies on the individual well-being of women in different stages of fertility treatment will be examined.

### **Scope of the Problem**

After marriage, parenthood is considered by many women of childbearing age to be the next step in the family life cycle. What often is not considered is the possibility of infertility. Infertility can be defined as the inability to conceive after one year of unprotected intercourse (6 months if the woman is over age 35) (Hart, 2002). In the United States, 1 out of 10 women, or more than 6 million annually, struggle with infertility (Hammond, 2001). Infertility is often viewed as a medical problem to be handled by physicians as well as an issue experienced

exclusively by women (Dayus, Rajacich & Carty, 2001). Acknowledged far less often is the emotional experience of a woman struggling with infertility (Corson, 1999). In addition, very little information is available concerning the impact of infertility on both the woman and the couple. As a result, mental health practitioners have limited information as to how to help this population (Eunpu, 1995).

Many researchers have concluded that the experience of infertility is more difficult for women than for men, mainly because women are typically the subjects of a multitude of tests, procedures and, of course, they carry the child if treatment is successful. The emotional struggles women face during this time can range from feelings of helplessness and a lack of control to doubts about the essence of their womanhood (Cudmore, 2005). If the woman decides to seek treatment for infertility, she may begin cycles of medical treatments ranging from low technology methods such as oral fertility drugs and artificial insemination to more highly invasive assisted reproductive technologies (ART) such as in vitro fertilization (IVF) (Williams, 2000). Throughout these treatments, women can experience significant physical side effects such as hot flashes, mood swings, breast sensitivity, headaches, anxiety, vertigo, nausea, weight gain and exhaustion (Diamond, Kezur, Meyers, Scharf, & Weinsel, 1999).

Although infertility represents a significant challenge for women, men also experience difficulty during this time (Cudmore, 2005). The extent of medical testing for infertility in males is usually semen analysis (i.e., determining normality if at least 20 million sperm are present within a one milliliter sample) (Mazor & Simons, 1984). Infertility treatment for males is typically limited to administration of fertility drugs similar to those taken by females (Williams, 2000). Many men report feelings of isolation from family and friends as well as physical isolation from their wives during many phases of infertility treatments (Imeson & McMurray,

1996). Men also report struggling with some of the same feelings of helplessness and frustration as their spouses. Some men experience feelings of failure, doubting their own masculinity and loss of power (Mazor & Simons, 1984). In some cases, these feelings may even lead to episodes of impotence (Hart, 2002). Though the male perspective will not be examined in this study, it is important to consider when discussing the female experience as it has a significant impact on the marital relationship created by both partners.

A woman's relationship may also suffer severe strain during a period of infertility. In a quantitative study assessing psychopathology in infertile women, the experience of infertility was reported to be the first major crisis experienced in their marital relationships (Edelmann & Connolly, 1998). Women were forced to make a multitude of difficult decisions as to whether they would seek fertility treatments and how they would manage gender differences in their emotional reactions to infertility (Myers & Wark, 1996). Researchers have reported some women can also experience a decline in satisfaction with their physical relationship during infertility treatment due to a strictly regimented intercourse schedule to create higher chance of conception (Ramezanzadeh, 2006).

To maintain the quality of their marriage, women must find ways to manage these new challenges. Therefore, a woman's coping skills are an essential tool to manage stress and conflict within the relationship. Yet limited research exists regarding the effective and non-effective coping strategies women use during fertility treatment and how these strategies are linked to women's marital satisfaction and individual well-being.

## **Theoretical Framework**

### **Crisis Theory**

Three theoretical frameworks were used to guide this study. The first of these is crisis theory. As discussed earlier, infertility often represents the first major crisis a woman

experiences. Menning (1975) refers to infertility as a significant life-crisis with the ability to threaten psychological and emotional stability. Other authors studying infertility also share these views. Hence, crisis theory provides a conceptual framework for understanding the nature of the crisis women may encounter (Barker, 1984).

According to Slaikeu (1990), crisis is a condition of distress and disorganization. During a crisis, the individual is unable to manage the state with previously successful methods of problem solving and either successfully adapt to the situation or experience a breakdown in functioning. According to crisis theory, every woman defines the crisis differently. One woman may experience a crisis during a particularly stressful phase or event, while another woman may adjust to this same event or phase with little to no stress. In other words, crisis is individually defined.

Crisis represents a time of extreme stress for a woman; and it is usually not avoidable. It may also provide an opportunity for necessary changes within a relationship that might not occur without that crisis (Pittman, 1987). A crisis can either lead to progress or retreat in the woman's relationship (Cohen, Claiborn, & Specter, 1983). The goal for counseling practitioners is to guide women so their crisis experience can represent a time of positive change.

In this theory, crises are categorized by type, maturational (normative) or situational (non-normative) (Cohen et al., 1983). Maturational crises refer to developmental stages through the course of life. These crises are generally common, universal experiences, such as puberty, marriage, or parenthood (Turner & West, 2002). Situational crises are unanticipated and external. For example, infertility, divorce, chronic illness, or poverty would each be categorized as situational crises. Once a crisis is identified and categorized, it can be effectively assessed. When this is achieved and stress takes on a tangible nature, change can occur (Pittman, 1987).

Within this framework, each of the above-mentioned examples represents a precipitating event in the evolution of a crisis. This event marks the identifiable beginning of a potential crisis. What differentiates the event or situation as a crisis for one woman versus another is individual perception (Slaikeu, 1990). In the experience of infertility, one woman may feel a diagnosis of infertility is a sign they were not meant to be parents. Another woman may perceive this diagnosis as a “bump in the road,” in which they will simply have to look into additional methods to conceive a child. The first woman may perceive infertility as a crisis while the second woman perceives it as a manageable stressor. Thus the individual perceptions of the situations differentiate a manageable stressor from a crisis.

Caplan (1964, as cited in Cohen et al., 1983) described the general process of responding to a crisis as a three-stage developmental sequence. In the first stage, a precipitating event brings about feelings of anxiety. To cope with these feelings, women rely on the coping mechanisms that have been successful in the past in managing stress. In stage two, when previously used methods of coping fail, there is an increase in anxiety and tension. During the third stage, emergency coping skills are developed and tried in an effort to alleviate stress. If these new skills fail to meet the needs of the woman, a breakdown in functioning will occur. If the skills are successful, the woman is able to manage the stress and experiences progress in the development of a stable relationship.

One major tenet of crisis theory is the focus on disequilibrium. Disequilibrium, as a reaction to crisis, is a severe emotional upset. Some common feelings of this reaction are tension, incompetence, and helplessness (Slaikeu, 1990). Disequilibrium begins to occur in the first stage of a crisis reaction. If balance is unable to be achieved in the event of crisis, disequilibrium will be exacerbated to eventually damage the relationship.

## **Stress and Coping Theory**

A second theoretical framework that guided this study is stress and coping theory. The transactional theory of stress and coping, developed by Richard S. Lazarus and Susan Folkman, outlined the experience of stress and how individuals appraise it. It also describes the coping processes individuals use to manage stress (Jordan & Revenson, 1999). The difference between traditional models of stress and the transactional theory of stress and coping is the focus on process and change rather than a static and structural view of stress. The process explored in this framework relies on the specific, unique experience of the woman in stress whereas previously studied models relied on typical reactions to stress seen under similar circumstances (Lazarus & Folkman, 1984).

In the transactional theory of stress and coping, the person and environment engage in a bidirectional relationship, with each one equally impacting the other (Lazarus & Folkman, 1984). The person and environment constantly interact, developing new meanings in the process. Much like systemic approaches, transactional theory finds it impossible to understand stress by only studying the person or the environment. It is the interactions and transactions between the two that create positive or negative events and most importantly, create stress (Lazarus & Folkman, 1987).

The transactional theory views stress as part of a larger picture of emotions. From this perspective, stress constitutes a negative relationship between the person and environment (Lazarus & Folkman, 1987). The experience of stress often includes emotions such as fear, shame, guilt, and anger. Stress is based on the specific assessment of the event, unique to the experience and appraisal by the person experiencing the event. It cannot be defined by what has brought on stress in the past or what may do so in the future (Lazarus & Folkman, 1984). The

adjustment to stress experienced by a woman is based on available resources, developed meanings, and coping processes (Peterson et al., 2003).

According to Lazarus and Folkman (1984), coping is defined as the ever-changing cognitive and behavioral attempts to control the external and/or internal demands perceived as strenuous or beyond the control of the individual. It is comprised of three key features; the actual actions of the woman, the context, and how the efforts made during this time change and adapt as the stressful event develops and unfolds. Coping processes are not inherently positive or negative. In fact, the same processes of coping applied in different circumstances may produce varied psychosocial outcomes (Jordan & Revenson, 1999). The study of coping within this framework has solely focused on process, referring to the constant change through time and situation. This process does not refer to the reactions or efforts made by the woman in the past, but what is actually happening during the present event (Lazarus & Folkman, 1987). Thoughts and actions displayed during times of stress are contextual, changing from one type of experience to another. Coping efforts are also contextual, based on the transactional relationship between the individual and his/her environment (Lazarus & Folkman, 1984).

The process of coping has been of interest to researchers conceptualizing infertility as a process crises experienced by women (Lee, Sun, Chao, & Chen, 2000). The nature of the infertility experience can be constant, erratic, and medically or personally unmanageable. It may also increase the need for new or revised coping efforts (Jordan & Revenson, 1999). This study will examine the coping processes and marital satisfaction reported by females experiencing infertility and their relationship to individual well-being.

### **The Developmental Theory of Infertility**

The final framework that guided this study is the developmental theory of infertility. Diamond et al. (1999) proposed five phases of infertility in which particular issues with

distinctive features are clustered together in each phase. These phases are known as: (a) dawning, (b) mobilization, (c) immersion, (d) resolution, and (e) legacy. In the Dawning phase, women are beginning to have an awareness of possible infertility. Most women have been attempting to conceive for at least several months, if not more than one year, but have not been formally diagnosed as infertile. This phase comes to an end once the woman seeks medical treatment.

During the mobilization phase, women begin a series of diagnostic tests. This involves frequent exposure to medical professionals, revealing medical histories, and submitting to a multitude of reproductive tests. It is at this time that a formal diagnosis of infertility is given by a medical professional. The immersion phase begins as women undergo further testing and start medical treatments for infertility. During this phase, women are kept in a constant state of limbo from month to month. Women begin each month with a renewed hope that their fertility treatments will be successful and they will be able to conceive, moving forward to the next stage in the life cycle, parenting. It is a battle between hope and despair coupled with a loss of privacy and control during treatments, anticipatory grief of being a childless woman and in some cases, the onset of marital turmoil. Toward the end of the Immersion phase, Assisted Reproductive Technologies (ART), such as in vitro fertilization, gamete donation, and surrogacy, become realistic options for treatment.

The fourth phase, Resolution, occurs when women have repeatedly experienced failure with various treatment options. Three possible outcomes result from these failures: (a) ending medical treatment, (b) mourning the loss of having a biological child, and (c) refocusing on alternative life paths. During this phase, women decide whether to pursue adoption, or choose to be childless. The final phase in this developmental framework is the Legacy phase. During this

time, the experience of infertility comes to a close and women must face the fact that they are unable to have a biologically-related child. Among some women, problems within the marital relationship arise. Other women may find a renewed sense of commitment and maturity within the marriage as a result of the infertility experience. It is the latter experience in which relationships are strengthened through this difficult process.

In this study the coping styles and marital satisfaction of women at different stages of the infertility treatment process will be examined. The various stages of infertility treatment will be operationalized by determining the number of treatments each woman has experienced.

### **Variables**

The study examined differences in the coping styles, marital satisfaction, infertility-specific coping strategies, and individual well-being of women in different stages of treatment. This study also examined the relationship among nine predictor variables and one outcome variable. The predictor variables include: three types of coping styles, marital satisfaction, three infertility-specific coping strategies, age, and number of fertility treatments experienced. The outcome variable was perceived individual well-being of women undergoing fertility treatment. In addition; descriptive information was collected on the study sample that included: (a) age, (b) ethnicity, (c) level of education, (d) income, (e) time of awareness of infertility problem, (f) time since diagnosis of infertility, (g) extent of treatments for infertility, and (h) geographic location.

### **Need for the Study**

Many researchers in the area of infertility have examined aspects of the treatment experience; the medical perspective, the treatment available, the emotional responses, and the stress experienced by women. It is known that women and men manage/cope with the experience of infertility in very different ways (Merari et al., 2002). It is also known that infertility has the potential to strengthen marital satisfaction or create marital distress (Watkins &

Baldo, 2004). Finally, it is known that the experience can have a significant impact on the physical and emotional health of a woman (Goetzl & Harford, 2005). What is less known is how a woman's coping resources and level of marital satisfaction influence her individual well-being. This study examines nine possible predictors of female psychological well-being: (a) three coping styles, (b) level of marital satisfaction, (c) three infertility-specific coping strategies, (d) age, and (e) stage of treatment.

The information gained through this study will be useful to a variety of professionals. Medical professionals in contact with women experiencing infertility will be able to recognize "red flags" and refer them to the appropriate services if needed. The research will also be of use to women in the midst of infertility treatments. Women with this issue frequently do a great deal of research on the topic, educating themselves about infertility, the causes, effects, and treatment options (Mazor & Simons, 1984). With so much focus on the physical and medical aspects, psychological stability and intimate relationships can be easily overlooked. With the information gathered from this study, women will be better equipped to manage the stress of infertility and may be more likely to address any decline in their well-being that they experience.

Practitioners in the field of counseling will benefit from the knowledge gained from the study and the potential to identify a new approach to counseling women through the crisis of infertility. Counselors working with women in this field will not only be able to identify potential problems but will have the opportunity to better prepare women for this experience. By understanding the factors contributing to successfully maintaining or strengthening one's individual well-being, counselors can assist women in strengthening their use of more effective coping mechanisms and in strengthening their marital relationship. They may also help them to understand their individual coping style and what the implications of that style are during

infertility and infertility treatment. Lastly, therapists can help women gain a better perception of the additional factors contributing to a decline in psychological well-being and how they might combat this potential result.

### **Purpose**

The purpose of the study was to examine the contribution of women's use of three styles of coping, their marital satisfaction, their use of three infertility-specific coping strategies, their age, and treatment stage in predicting the individual well-being of married females experiencing infertility. A secondary purpose was to identify whether there were differences in coping processes, marital satisfaction, infertility-specific coping strategies, and individual well-being in women at different stages of infertility treatment. The study sample included heterosexual married women of typical child-bearing age (18-45) currently participating in infertility treatments in the United States. A cross-sectional survey method was used to examine married females experiencing infertility using various fertility treatments. The primary variables included in this study were (a) 3 coping styles, (b) the level of marital satisfaction, (c) 3 infertility-specific coping strategies used, (d) perception of individual well-being, (e) stage of fertility treatment, and (f) age.

### **Research Questions**

The following research questions were addressed in this study:

RQ<sub>1</sub>: Are there differences by age and stage of treatment in the styles of coping (*Task* oriented, *Emotion* oriented, and *Avoidance* oriented), levels of marital satisfaction, infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), and individual well-being of women engaged in infertility treatment?

RQ<sub>2</sub>: What influences do the three styles of coping (*Task* oriented, *Emotion* oriented, or *Avoidance* oriented), the level of marital satisfaction, the three infertility-specific coping

strategies (*Space, Control, and Beliefs*), the number of fertility treatments, or the woman's age have in predicting the level of individual well-being of women engaged in infertility treatment?

### **Organization of the Study**

Literature related to the purpose of the study is discussed in Chapter 2. Chapter 3 provides a review of the methodology used to design and implement the study. It also describes the variables of the study in more detail. Chapter 4 presents the results obtained from the study. Chapter 5 presents a detailed discussion of the research findings and their implications for further research in this area.

## CHAPTER 2

### REVIEW OF LITERATURE

The literature reviewed for this study addresses infertility and the emotional impact of infertility. Literature describing the causes, diagnosis, and medical treatment of infertility is reviewed as is literature on treatment options. This review focuses on the experiences of infertility of the individual woman, her partner, and the couple. Literature examining psychological morbidity during infertility, social perceptions about infertility and parenthood, the influence of gender expectations, treatment options, the impact of the experience on each individual and the couple, coping styles, and the role of counseling during the process and treatment of infertility is also discussed. In addition, literature describing societal views on infertility is presented. Although the study's focus is on the woman's experience, it is important to have an understanding of the man's as well as the couple's perspective on infertility to appreciate the differences between males and females.

Having a child is the dream of many women and biologically what females were designed to do. Deciding to have a child involves preparation, anxiety, and countless thoughts about what kind of person the child will be. During the pregnancy, dreams are formed about parenthood and goals are established for the future of the child. All of these things are part of both a psychological and social transition to parenthood delineating a shift in thinking and roles for individuals and couples. Unfortunately, not every couple makes this transition smoothly. Infertility can create obstacles to the transition and create new and unpredictable stressors arising in the couple relationship, testing its strength and stability. Despite the preparation most couples make for parenthood, rarely is a couple prepared for the difficulties of infertility and the physical and emotional stress experienced by the woman.

Women appear to experience infertility in a variety ways. Some women survive the struggles involved in infertility and emerge stronger and more confident in their relationships. Other women are unable to withstand the stressors placed on them and experience a decline in marital satisfaction and a breakdown in their relationship with their partner. Differing personal resources in women are significant in influencing their ability to move successfully through the process of infertility treatment. This study examined the impact on women's individual well-being of three types of personal resources: (a) women's general coping styles, (b) specific coping strategies, and (c) marital satisfaction, when at varying treatment stages and ages.

## **Infertility**

### **Infertility Defined**

Infertility can be defined as the inability of a man, woman or couple to conceive a child or the inability to carry a child to live birth (Dayus et al., 2001; Hammond, 2001; Jordan & Revenson, 1999; Nordenberg, 1997; Peterson et al., 2003; Smith & Smith, 2004; Watkins & Baldo, 2004). This diagnosis is typically given after one year of unprotected intercourse not resulting in conception (Edelmann & Fielding, 1998; Smith & Smith). Infertility can be separated into two categories: primary infertility and secondary infertility. Primary infertility is defined as the inability to conceive a first child. Secondary infertility is the inability to conceive a child following the live birth of one child (Smith & Smith).

### **Infertility Statistics**

Some discrepancy exists as to the number of individuals and couples affected by infertility. According to several researchers, approximately 8 % to 10% of the United States population, or 6 million people per year, struggle with infertility (Hammond, 2001; Hart, 2002; Eunpu, 1995; Jordan & Revinson, 1999). This statistic results in approximately 6 million women in the United States (Hammond). One researcher estimated the prevalence at 12% of

couples of childbearing age experiencing infertility (Elliot, 1998). Other researchers have reported that 1 in 6 couples in the United States experience infertility (Holditch-Davis, Sandelowski & Harris, 1999; Peterson et al., 2003, Schneider & Forthofer, 2005). Yet other researchers estimate the occurrence of infertility to be between 8% and 15% (Edelmann & Fielding, 1998, Wilcox & Rossi, 2002). For the purpose of this study, the estimated percentage of couples experiencing infertility is between 8% and 17%, based on the available research.

Many couples believe conceiving a child will be an effortless process. In actuality, couples only have a 30% chance of conceiving in a single month with consistent, unprotected intercourse (Hammond, 2001). For 80% of couples, conception occurs within 1 year of unprotected intercourse (Hammond). Although it is a common belief that infertility is a female problem, between 30% and 50% of infertility problems are due to male factors (Elliot, 1998). Another study estimated the percentage at 40% (Hammond).

### **Causes of Infertility**

#### **Historical Views**

Current research on the causes of infertility reveals a dramatically different picture from those emphasized in the past. Historically, infertility was linked to psychological problems rather than physical issues. This was due to the limited resources researchers had to conduct infertility testing and due to the influence of psychoanalytic perspectives of personality and psychopathology (Eunpu, 1995). In one example, Rubenstein (1951) described infertility as a psychological problem using a gynecological label. Cook (1987) noted the root of infertility was previously viewed as a woman's unconscious resistance of pregnancy due to personal struggles concerning motherhood, femininity, immaturity, and hatred of their own mothers.

During that era researchers compared fertile and infertile women, and found that infertile women had a higher degree of emotional disturbance, psychotic presentation, and schizoid

tendencies (Eisner, 1963). One study reported that infertile women had an increased frequency of hysteria, aggressive personality disorders, difficulties in sexual relationships, and greater ambivalence (Mai, Munday, & Rump, 1972). Slade (1981) described infertile women as having restricted attitudes toward sexual issues and greater overall guilt. Due to limited diagnostic capacities, no organic cause of infertility was reported in over half of the presented cases.

Today, with improvements in infertility research and diagnostic testing, experts believe that psychological factors are not a cause of infertility, but often are a result of the experience of infertility. Infertility is currently believed to result from an organically based cause in approximately 90% of cases and those causes may be due to either female and/or male factors (Eunpu, 1995).

### **Present Views**

Current research presents a long list of causes for infertility, almost all of which are organically based and attributable to both male and female factors. In the majority of cases, the cause lies with one or the other person; however approximately 10-20% of infertility diagnoses are attributable to a combination of both male and female factors (Fisch, 2005). In 25% of infertility cases, couples have more than one contributing factor such as endometriosis and tubal blockage (Hart, 2002; Kenigsberg, 2006).

There are many female factors contributing to infertility. Nordenberg (1997) found ovulation disorders, pelvic inflammatory disease, surgery for ectopic pregnancy, endometrioses, and fallopian tube blockage as some contributors to infertility (Meadows, 2004). Other factors include irregular menstruation, a history of miscarriage, and infection. Hypothalamic dysfunction, chronic disease, pituitary abnormality, thyroid dysfunction, ovarian dysfunction, adrenal dysfunction, luteal phase defect, immunologic factors, coital factors, peritoneal factors, tubal factors, cervical factors and reluctant ovum syndrome may also contribute to infertility.

(Trantham, 1996). Kenigsberg (2006) also cited uterine problems such as fibroids, polyps, and uterine structural problems as other common factors.

Equally common contributors to infertility are male factors. Some of these include erectile dysfunction, reproductive tract infections, clogged ejaculatory ducts, and varicoceles (Fisch, 2005). Other factors are attributable to the male sperm. Low sperm count, problems with quality of sperm, and the ability of sperm to reach and penetrate the female egg may also contribute to infertility (Hart, 2002; Kenigsberg, 2006; Meadows, 2004; Watkins & Baldo, 2004). Elliot (1998) described some cases of male factor infertility as a result of spinal cord injuries and azoospermia. Azoospermia refers to a lack of sperm in the ejaculate. Hypogonadism occurs when testosterone levels are abnormally low. Both primary and secondary hypogonadism may contribute to infertility in addition to androgen insensitivity, and altered sperm transport (Jose-Miller, Boyden, & Frey, 2007). Other contributors include severe medical illness, such as mumps, severe testicular injury, diabetes, prostate or urethrine surgery, tumor, or impotence (Nordenberg, 1997).

Lifestyle and environmental factors may also play a part in infertility. Fisch (2005) cited smoking, diabetes, prescription medication, sedentary lifestyle, high cholesterol and injury as direct contributors to erectile dysfunction. Exposure to toxins such as pesticide, use of contraceptives, sexually transmitted diseases (STDs), prevalent use of antidepressants, steroids, alcohol, and drug use, such as marijuana, may all affect fertility (Nordenberg, 1997; Stanton & Dunkel-Schetter, 1991; Trantham, 1996). Severe emotional or physical stress may also affect fertility, interfering with a man's ability to produce viable sperm (Elliot, 1998). In females, stress may interfere with ovulation. In many cases, physical dysfunction affects infertility and

can be intensified by emotional stressors; however, many of the procedures included in the infertility treatment process can also be stressful themselves (Cook, 1987).

A final cause of infertility widely discussed in recent years is due to delayed childbirth.

Societal norms may encourage women to focus on their career early in life, rather than motherhood, and this has had an effect on fertility. Although society perceives an increase in infertility rates, in actuality, very few changes have been seen over time. However, there has been a large increase in infertility among women delaying childbirth until the mid to late 30s and early 40s (Jordan & Revenson, 1999; Stanton & Dunkel-Schetter, 1991; Trantham, 1996).

According to Fisch (2005), the rate of women bearing their first child after the age of 35 has increased by 116%. The rate of first time fathers over 35 has increased by 50%. In infertility, the number of viable eggs is not as important to the process as the age of the eggs.

Chromosomal and metabolic abnormalities are far more common among older eggs, resulting in either infertility or miscarriage (Kenigsberg, 2006). Another major cause for concern with more mature eggs is the increased chance of birth defects due to various abnormalities (Fisch). With increased age, fertility declines at a significant and rapid pace. At the age of 35-36 years, women are almost always recommended to an infertility specialist within one month of attempted conception. After 37, a specialist is considered an essential part of the process (Kenigsberg).

### **Diagnosis of Infertility**

Securing a diagnosis of infertility is often a long and tedious process. The procedures involved can be stressful, time-consuming, costly, and may take years to complete (Eunpu, 1995). The diagnostic process is usually started after one year of unprotected sexual intercourse without conception (Glazer & Cooper, 1988). This process includes a complete medical history for both male and female partners followed by a complete physical examination based on the

medical history (Fisch, 2005). The progression of diagnosis can take from 3 months to a year or more, based on the couple's preferences (Stephenson, 1992).

The initial phase of diagnosis begins with a complete medical history taken from both the woman and her partner. The female medical history includes questions about the menstrual cycle, past attempts at conception, frequency of intercourse, birth control history, weight, age, history of miscarriage, heart disease, trauma, and current medication (Kenigsberg, 2006; Hammond, 2001). Lifestyle is also included in the medical history with attention to habits such as: drinking, smoking, recreational drug use, and exposure to toxic chemicals (Stephenson, 1992). The male medical history includes many of the same questions in addition to involvement in previous pregnancies, previous surgery, hernia, undescended testes, difficulty maintaining an erection, and history of illness (Kenigsberg). The medical and sexual histories are discussed both as a couple and individually (Stephenson). Further testing and examination is based on the medical histories gathered from each partner.

Diagnosis for females continues after the medical history is taken with a variety of tests and procedures. A basic physical exam is completed, assessing for perforated hymen, normal functioning in the fallopian tubes, ovaries, cervix, uterus, and clitoris, vaginal infections, tears, polyps, infection, endometriosis, tumors, routine blood and urine tests, and a pap smear (Eunpu, 1995; Hammond, 2001; Stephenson, 1992). Other diagnostic testing includes basal body temperature (BBT) charting completed by the woman every morning before getting out of bed (Glazer & Cooper, 1988). Ovulation testing includes an endometrial biopsy, serum progesterone blood test, a series of ultrasounds, and LH and FSH (hormones) surge urine tests (Stephenson, 1992). A hysterosalpingogram, also known as a tubogram follows. This procedure involves passing dye through the cervix and into the uterus, to test the functioning of the fallopian tubes.

This procedure is known to be very painful for women (Field & Marck, 1994; Glazer & Cooper). Laparoscopy, a procedure in which an incision is made in the navel, and a laparoscope is inserted through this opening to search for abnormalities and endometriosis is another step in the diagnostic process (Hammond). Another procedure common for the female is an endometrial biopsy, to determine proper ovulation and endometrial quality (Field & Marck; Glazer & Cooper). This procedure is also known to result in a great deal of physical pain.

Male partners must also be tested to determine the cause of infertility in the couple. After a complete medical history is taken, a thorough physical examination seeks to rule out a variety of physical causes. Undescended testes, presence of varicocele, testicular tumors or cysts, size and consistency of prostate, evidence of sexually transmitted diseases, infection, pubic hair, and baseline lab studies are all studied to ensure proper reproductive functioning (Hammond, 2001; Eunpu, 1995).

### **Medical Treatment of Infertility**

#### **Medical Treatment in the Past**

The first recorded assisted reproductive treatment procedure was performed in 1790 by a British physician, John Hunter (da Motta & Serafini, 2002). Since then, infertility treatment has made tremendous advances. In the past, the only option to most couples not able to conceive was adoption, since very little was known about infertility and even less about its treatment (Glazer & Cooper, 1988). The first artificial insemination was performed in 1909, marking a breakthrough in fertility technology (Mulrine, 2004). Many of the limitations in the early years of infertility research were due to limited diagnostic capabilities. In the majority of cases, a diagnosis of unexplained infertility was given (Eunpu, 1995). Most research during this time focused on female psychopathology as the most likely contributor to the diagnosis of infertility (Rubenstein, 1951). The male partner was never included in the diagnostic investigation,

resulting in misdiagnosis at least 40% of the time, based on the information known today. The 1950s marked a milestone in infertility treatment as husbands began to be included in diagnostic testing (Johansson & Berg, 2005).

The first national fertility survey took place in 1965, establishing infertility rates at the time between 10-13% (American Society for Reproductive Medicine, 2003). In 1978, fertility treatment changed drastically after the successful introduction of assisted reproductive technology (ART) resulted in the birth of a baby girl, Louise Brown, in the United Kingdom (Adamson, 2009). Use of ART in the United States began in 1981 and includes gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT) and in vitro fertilization (IVF) (Hart, 2002). Each year, new breakthroughs are made in the field of infertility and new treatments become available to patients seeking conception. The success rates have improved dramatically and risks have lessened. In addition, the ability to accurately diagnose not only infertility but also the cause has led to greater success in all areas of treatment.

### **Medical Treatment Today**

Infertility treatment today encompasses a wide range of options for both men and women. These options are selected after a variety of considerations have been made; often focusing most on diagnosis, prognosis, and financial means (Gibson & Myers, 2000). In approximately 80 to 90% of diagnosed cases of infertility, drug therapies or surgical procedures are an effective treatment. Less than 3% of cases need more advanced and higher-cost treatments such as in vitro fertilization (Fisch, 2005). Although this percentage seems low, it is important to consider the advances in reproductive technology have allowed the number of babies born through ART to quadruple in the past 10 years (Mulrine, 2004). In 1994, the number of ART babies born in the United States was approximately 11,000. In 2001, this number rose to over 40,000 (Mulrine).

The process of diagnosing the cause of infertility has also advanced significantly in recent years; however, a focus on female-factor causes remains. Because the focus still lies on the woman, the man's infertility continues to go undetected in many cases. Due to the lack of testing or limited testing for male infertility, most men never become aware of their fertility problem (Fisch, 2005). In addition to the limited diagnoses for males, treatment options in male-factor infertility are also minimal. Treatment choices for women are generally more varied and tend to be more invasive than those for men. These treatments also come with a higher cost than those available to men (Gibson & Myers, 2000). Descriptions of the most common fertility treatments used today are addressed in a subsequent section of this literature review.

### **Future Advances in Infertility Treatment**

Advancements in the treatment of infertility are due to significant research in the area. There is a variety of treatment options currently available or in the process of development. Some advancement focuses on fine-tuning existing treatments. One example, uterine receptivity, or identifying the most effective time for implantation, will likely become more precise. Another example, freezing eggs, will become a more reliable practice (Kenigsberg, 2006). Tubal ovum transfer, which involves retrieving a woman's eggs and placing them closer to the uterus, may allow natural or artificial insemination to occur if the woman's fallopian tubes are blocked (Stephenson, 1992). Further advances in research will make this a more widely used and effective procedure. Research in human male gamete physiology anticipates a better understanding of cellular and molecular aspects, leading to advancements in the treatment of male-factor infertility (da Motta & Serafini, 2002). In the future, reproduction without sperm may be possible, as researchers look to find an agent with the ability to turn sperm production on and off with no impact on the testicle (Kenigsberg). Presently in the United States, the use of infertility treatments has become quite prevalent with approximately 1 in 100 babies conceived

through these measures. The problem, however, lies in the lack of regulation in the industry, resulting in the need for more rigorous data collection and reporting, as well as more extensive research on the risks of various treatments (Mulrine, 2004).

### **Treatment Options**

Treatment of infertility begins after a thorough diagnosis has resulted in a clearly defined cause. Approximately 80-90% of couples seeking a diagnosis for infertility will reach this definite diagnosis (Eunpu, 1995). Of this group approximately 50-70% will successfully conceive (Holditch-Davis et al., 1999). After the testing period has ended, a physician will present the best options to treat the diagnosed problem. With the vast number of options available in modern-day medicine, many factors must be considered including the financial, emotional, and social consequences involved with each type of treatment (American Society for Reproductive Medicine, 2003). The most commonly used options available for infertility today include drug and hormone therapies, surgical repair, and assisted reproductive technologies (ART). Between 80 and 90% of infertility cases are treated with either drugs or surgery or a combination of the two (Nordenberg, 1997). In most cases ART is begun once drugs and surgery have proven to be unsuccessful.

### **Drug and Hormone Therapy**

In the United States today, approximately 1.8 million women are currently using infertility medication (Gibson & Myers, 2000). The main reasons for using fertility drugs are to boost ovulation, encourage ovulation away from a known blockage, increase the chances of success with intrauterine inseminations (IUI), generate multiple eggs each month or help to produce the amount of eggs necessary for in vitro fertilization (Kenigsberg, 2006). Examples of drugs considered hormone stimulators include Clomid, Pergonal, Metrodin and Humepon, commonly prescribed to women with ovulation problems (Nordenberg, 1997).

When drug therapy in pill form is ineffective, hormonal therapy (HT), given in administered injections, may be used to improve the hormonal stimulation needed to conceive (Watkins & Baldo, 2004). Gonadotropins are an example and are administered by injection at home by the patient or her partner. Egg production is carefully monitored by the fertility clinic through consistent ultrasounds in order to use this therapy in conjunction with human chorionic gonadotropin (hCG) and trigger ovulation (Goetzl & Harford, 2005). Injectable follicle-stimulating hormone (FSH) can also be used to stimulate the ovary's development of follicles and mature eggs (Kenigsberg, 2006). Human menopausal gonadotropin (hMG) releases FSH and luteinizing hormone (LH) to directly stimulate the ovaries after a pituitary gland failure (Mayo Clinic staff, 2009). Drug and hormone therapy are the most common first steps in the process of fertility treatment as the risks involved are fairly low and they come at a reasonable price in comparison to more invasive treatments.

### **Surgical Repair**

Microsurgery and laser surgery are commonly used to diagnose and repair problems such as endometriosis, distortions of the fallopian tube, and unexplained infertility. Hysterosalpingography (HSG) and laparoscopy are considered to be the “gold standard” procedures to assess and repair dysfunction of the fallopian tube (da Motta & Serafini, 2002). Laparoscopy is a preferred procedure for women with no known cause of infertility or for a known and surgically correctable problem (Hammond, 2001). In treating tubal-peritoneal disease, laparoscopy has become the preferred alternative to more invasive laparotomies (da Motta & Serafini). In a study of laparoscopy use with women diagnosed with unexplained infertility in Tokyo, it was found that laparoscopy was not only more cost effective than ART, but also resulted in a higher pregnancy rate in women under 30 than ART (Nakagawa et al., 2007). Laparoscopic surgery can also be used as a pre-treatment to IVF. For example, by using

this technique to remove hydrosalpinges associated with tubal infertility, IVF has a higher success rate (Farquhar & Johnson, 2004). It also seems that advances in laparoscopic surgery for distal tubal disease are generating comparable success rates to IVF (da Motta & Serafini). Laparoscopy may also be effective in vaporizing endometrial implants and lyse adhesions or to cauterize adhesions. It is most commonly performed in the early stages of the menstrual cycle and is generally an outpatient procedure (Hammond).

Hysterosalpingography (HSG) is a procedure performed by a radiologist where the shape and patency of the uterus and fallopian tubes are investigated. During the procedure, a radiographic dye is inserted into the uterus to diagnosis uterine malformation or tubal occlusion (Hammond, 2001). If a blockage is discovered, a catheter is used by an interventional radiologist to open proximally occluded tubes (Baramki, 2005). Obstructions may also be treated with tubal cannulation or balloon tuboplasty (Hammond, 2001). Some research has found the rate of pregnancy is increased following HSG. It is suspected that the dyes used in this procedure may provide a therapeutic effect by clearing tubes of mucus plugs, reducing adhesions, or may have an anti-bacterial effect by eliminating tubal infections (Hammond, 2001). Although some believe that the precision of HSG is questionable, the latest procedures developed for assessment of tubal disease may be able to improve quality. Some of these include falloposcopy, microlaparoscopy and transvaginal hydrolaparoscopy (Swart et al., 1995).

Surgical repair may also be used to treat male-factor infertility. One of the most common uses in this area is to treat a varicocele or poor semen quality by improving blood drainage from the testicle (Hammond, 2001). When surgery is performed to repair damage or deformities in the ovaries, fallopian tubes, uterus, or with male-factor infertility, it is done so only if the chances of restoring fertility are high (Nordenberg, 1997).

## **Artificial Insemination**

Artificial insemination is a procedure in which sperm is placed directly into the female reproductive system. The two most common insemination procedures can be performed through intracervical insemination (ICI), where sperm is deposited at the end of the vagina near the cervix, or intrauterine insemination (IUI), where sperm is deposited in the uterus (Kenigsberg, 2006). ICI involves the injection of collected semen into the external cervix (Hunter & DeCherney, 1999). Though ICI is the first form of insemination developed and has often proved effective, its use has been superseded by IUI in the majority of cases where insemination is appropriate. IUI is typically used for male-factor infertility or unexplained infertility and can be performed naturally or with the assistance of ovulation stimulating drugs (Granne & Childa, 2009). It is also considered to be the first line of treatment to use with a variety of infertility diagnoses due to its low-cost, safety and significant success rates (Hunter & DeCherney). In this procedure, the sperm is inserted directly into the uterus at the time of ovulation (Watkins & Baldo, 2004). The pregnancy rate for IUI varies depending on maternal age and diagnosis, but generally ranges between 8% and 60% (da Motta & Serafini, 2002). Both ICI and IUI are relatively painless procedures that do not require anesthetic and are often used before attempting IVF in order to create a more natural conception process (Watkins & Baldo).

## **Assisted Reproductive Technologies (ART)**

Assisted Reproductive Technology (ART) comprises the newest area of infertility treatment and generally refers to a treatment for infertility in which both sperm and egg are removed from each partner to attempt fertilization. ART was first used in the United States in 1981 (Hart, 2002). Technical advances made in this area over the last two decades have combated unexplained infertility, age-related infertility, low sperm count, and physical limitations, among many other complications (Wootton, 2000). These advances have made ART

far more popular than ever before in infertility treatment. In fact, the number of babies born through ART saw a dramatic rise of 94% between 1996 and 2001 (Kenigsberg, 2006). ART is generally pursued once less invasive options such as drug therapy or surgical repair have been exhausted. A variety of Assisted Reproductive Technologies (ART) are available today and most commonly include in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT) and a combination of IVF and GIFT (Gibson & Myers, 2000).

## **In Vitro Fertilization**

In vitro fertilization accounts for the majority of ART procedures, reported at 71.8% (Hart, 2002). IVF is an artificial reproductive procedure in which eggs and sperm are combined “in vitro,” meaning “in glass,” at a lab for fertilization. Once an embryo is successfully produced, it is implanted into the woman’s uterus (Kenigsberg, 2006). The use of IVF has risen dramatically since the first successful IVF birth took place in the UK in 1978 (Ponjaert-Kristoffersen, 2005). It has become a viable solution for irreparable tubal disease, endometriosis, and cervical and immunological factors preventing natural conception as well as male factor infertility and unexplained infertility (da Motta & Serafini, 2002). Though rates of success vary significantly depending on individual factors such as age and diagnosis, it does allow for at least some chance of pregnancy where there was previously none. Pregnancy rates for women over forty using this procedure are small, but ranging between 5% and 7% (Gibson & Myers, 2000). Rates for women under the age of 40 range between 15% and 40% (da Motta & Serafini, 2002). In the future, these rates may continue to rise as they have for the last thirty years since IVF began. Continued research has made it possible to improve aspects of the IVF process for higher rates of success as time goes on.

The process of IVF is broken down into 4 steps. In the first step of treatment, the women’s ovaries are stimulated using fertility drugs to produce enough eggs to choose the most

viable options (Kenigsberg, 2006). After close monitoring and meticulous timing, laparoscopy is used to remove the eggs from the ovaries and place them with pre-washed sperm in a glass culture dish (Ponjaert-Kristoffersen, 2005). If successful fertilization takes place in the dish, the resulting embryos are implanted in the uterus or frozen for use at a later date (Gibson & Myers, 2000).

### **Gamete Intrafallopian Transfer (GIFT)and Zygote Intrafallopian Transfer (ZIFT)**

Gamete intrafallopian transfer (GIFT) refers to a process where eggs and sperm are removed from the body, mixed, and placed directly into the fallopian tubes (Watkins & Baldo, 2004). It involves 3 main steps. First, the woman's ovaries are stimulated with medication and monitored (IVF.com, 2007). Oocytes are then retrieved under general anesthesia using laparoscopy (Hammond, 2001). Once ova are evaluated for maturity and sperm are obtained and processed; the sperm and ova are transferred into the woman's fallopian tube for fertilization to occur naturally (IVF.com, 2007).

Zygote intrafallopian transfer (ZIFT) is generally used to treat blockages in fallopian tubes that have prevented the sperm from normally binding to the egg (Toner, 2002). The process is almost identical to that of GIFT, however, sperm fertilize the egg in vitro and the resulting embryo is transferred to the fallopian tubes (Hammond, 2001). GIFT and ZIFT, though both procedures produce significant rates of pregnancy and live births, have become less commonly used in favor of IVF, which produces equal or better rates of pregnancy and live births (Toner, 2002).

### **Sperm and Egg Donation**

Donor eggs or sperm are typically used when the female or male has difficulty producing viable eggs or sperm of their own. These donations are taken from someone other than the

partner (Watkins & Baldo, 2004). Donor eggs are often chosen as a result of female age or hormonal deficiencies preventing egg production. Using a donor egg will often reduce the risk of chromosomal abnormalities and increase the chance of conception (Goetzl & Harford, 2005). Donor sperm is typically used if the male is diagnosed with azoospermia, severe oligospermia, or asthenospermia that has not been treated successfully (Hammond, 2001).

### **Gestational Carriers and Surrogacy**

Gestational carriers are used when a woman cannot physically carry a child but is able to produce viable eggs. The woman's egg is fertilized by her partner's sperm and the resulting embryo is implanted into the uterus of the gestational carrier (American Society for Reproductive Medicine, 2003). Surrogacy becomes an option when the female does not produce eggs or her eggs are compromised in some way. It gives couples the option of allowing a surrogate to use her own egg and the partner's sperm to become pregnant (American Society for Reproductive Medicine, 2003). When using a surrogate, a couple forms a contract with a woman stating that after she has conceived, carried the pregnancy, and delivered the child, all parental rights are given to the commissioning couples (Raziel et al., 2005). Surrogacy is often considered a last resort before considering adoption as it not only prevents a biological link to both parents, but the woman is not able to carry the child during pregnancy (Gibson & Myers, 2000). Each of these options should be researched and considered at length before making a decision as a variety of emotional complications could arise for either partner when a third party is involved in some way with the conception and carrying of the child.

### **Alternative Treatments**

Infertile couples are now able to choose from a variety of traditional medical treatment options for infertility. Some persons may not be successful with these treatments while others do not feel comfortable with traditional treatment options. There are many alternative treatment

options for couples seeking to conceive a child. While many are available, acupuncture and traditional Eastern medicines boast substantial success for infertility and seem to be the most commonly used alternative practices.

Acupuncture has been reviewed by several studies, each finding it to be a highly effective treatment for infertility (Zhang & Fay, 2005). Some studies have found acupuncture causes an increase in blood flow to the reproductive organs, improving the quality of eggs (Howard, 2006). Acupuncture also claims to stimulate ovulation by increasing levels of progesterone and regulating other female hormone levels (Zhang & Fay). A correlational relationship has been found in using acupuncture as a complement to IVF treatment (Anderson, Haimovici, Ginsburg, Schust & Wayne, 2007). Women are turning to acupuncture more frequently as a way to create optimal health and balance for their bodies prior to fertility treatment or to conceive naturally (Howard, 2006). It is important to consider there is still a need for research to establish the efficacy of acupuncture in the treatment of infertility as there is little research to support a causal relationship between acupuncture and infertility treatment success (Anderson et al., 2007).

### **Side Effects and Risks of Treatment**

Medical advances in the area of infertility have made great strides. Women and couples previously unable to conceive a child are now able to do so with the help of medicine and technology. Unfortunately, with these advances come risks and ethical concerns needing to be addressed prior to committing to treatment.

Most of the side effects involved with treatment are female-related, as women are typically on the receiving end of treatment. The most minor but significant side effects of treatment include, but are not limited to: nausea, headaches, loss of hair, flushing, and abdominal bloating (Fisch, 2005). Other side effects include wide mood swings, appetite change, breast tenderness, pelvic fullness, and soreness at injection sites used for drug therapy (Kenigsberg,

2006). Weight gain and adult acne were also noted as undesirable side effects (Imeson & McMurray, 1996). Pelvic fullness, abdominal bloating, and severe cramping are often a sign the ovaries are enlarged by over stimulation, sometimes resulting in a cancelled cycle of treatment to avoid potential harm (Goetzl & Harford, 2005).

One of the most important moderate to severe risks is the increased chance of multiple pregnancies resulting from several treatment options (Fisch, 2005). While this may be considered a blessing for some couples with the resources for only a limited number of fertility treatments, problems do arise if too many embryos are formed. Multiple babies carried during pregnancy increase the risks of complications, especially with three or more (Goetzl & Harford, 2005). In this case, couples must often choose to terminate one or more pregnancies in order to improve the chance of success for the remaining fetuses (Kenigsberg, 2006). Another risk detrimental to the women in the treatment process is depression associated with a variety of treatment options in addition to the constant changing in emotions when treatments fail (Imeson & McMurray, 1996). Depression and other emotional reactions to infertility will be discussed later in the chapter.

There are risks involved in all forms of infertility treatment. The risks involved in drug therapy include: ovarian neoplasia, dyspareunia, osteoporosis, and ovarian hyperstimulation (Hammond, 2001). In surgical repair, the biggest risk is infection (Nordenberg, 1997). ART involves each of the risks described above as well as miscarriage or very early preterm labor, leading to long-term health concerns for the baby (Goetzl & Harford, 2005). The risk for congenital abnormalities, or birth defects is two times greater in babies conceived through IVF than those conceived naturally (Fisch, 2005). These birth defects include, but are not limited to,

overgrowth, speech-impairment, balance and movement problems, and retinal tumors (Kenigsberg, 2006).

The risks described should be carefully considered before beginning treatment. Although some women and couples believe the greatest risk of treatment is not having a baby at all, it is important to recognize the impact that a reproductive technology can have on both the physical and emotional aspects of the individual and couple. It should also be remembered that the research on physical and emotional aspects of reproductive technology is new and evolving, making it difficult to accurately predict the long-term effects on both mother and child (Eunpu, 1995). Whatever the chosen treatment(s) may be, the partners need to research and deliberate on the process and possible effect to be prepared for possible complications and outcomes.

### **Ethical Concerns of Treatment**

Infertility treatment brings a range of new possibilities to infertile women and couples hoping to have a child. Unfortunately, these possibilities also bring ethical concerns that surround the treatment for infertility. The ethics of treatment, religious pressures, the rights of the embryos and conceived fetuses, and the professional responsibilities of medical professionals must all be taken into account to ensure a high standard of care and respect for human rights.

Currently, there is very little control over the practice of infertility treatment in the United States (Granne & Childa, 2009). Few guidelines have been put into place regarding treatment and there exists no national policy or law regarding frozen embryos (Holbrook, 1990). This is an area where laws and regulations are necessary to ensure proper treatment as well as preserve the rights of all parties involved in the process. In fact, the United Kingdom currently leads the world on quality control for infertility treatment. Two organizations have been developed to regulate the practice of medical treatment and to ensure the welfare of the resulting fetuses.

These organizations are the Human Fertilisation and Embryology Authority (HFEA) and the National Care Standards Commission (NCSC) (Jenkins & Corrigan, 2004).

Religion plays a large role in the decisions couples make to treat infertility. Today, the Catholic Church allows couples to seek treatment; however, the church forbids reproductive technology where medical techniques are substituted for intercourse (Zimmerman, 2009). Some fundamental Protestants believe the use of donor sperm to be adultery, producing an illegitimate child (Stephenson, 1992). Because of these concerns, a number of infertility specialists have become available in the United States that treat patients in accordance with the teachings of the church (Zimmerman). It remains an area of confusion for many patients who must walk a fine line between their religious views and their desire for a child, often forgoing these beliefs in order to conceive.

Another ethical issue is the individual rights of not only the children born through assisted reproduction but also embryos produced through the process. One concern centers on the secrecy involved in fertility treatment, specifically with the use of donor eggs or sperm. In these cases the truth about true biological origins is often kept from the child (Holbrook, 1990). This can become a problem in a variety of circumstances, especially if the child were to learn of his or her origins accidentally. The treatment of embryos in assisted reproduction is also an area of concern where there are multiple views regarding their use and destruction. For example, many Catholics and Protestants view the discarding of unneeded embryos as abortion (Stephenson, 1992). Because the United States lacks legislation in this area, there is no limit on the number of embryos allowed for use at one time in ART and no standard for what to do with those that are left over (Holbrook, 1990).

Ethical treatment of patients by medical professionals is also a significant topic of concern in the treatment of infertility. A common occurrence among infertility clinics is inaccurate or misleading published information about success rates of IVF (Holbrook, 1990). This creates a sense of false hope for many individuals and couples wanting children, and can encourage them to spend more money than necessary on a particular treatment that may not be as effective as presumed. There is also a great deal of pressure placed on infertility specialists to maximize the chances of success during treatment by using higher-than-normal doses of ovary stimulating drugs (Granne & Childa, 2009). This can significantly increase the chances of multiple births resulting in a variety of high-risk factors.

### **Cost of Treatment**

Infertility is not only an emotionally draining experience, but can be financially draining as well. The cost of infertility treatment can range between \$50 to \$15,000 for a single treatment for each hormone-induced menstrual cycle and several cycles of treatment are often needed (Gibson & Myers, 2000). The increase in the use of fertility treatments and the new options available have resulted in a dramatic increase in the amount of money spent on infertility treatments each year. From 1999 to 2004, spending on IVF alone rose by 50%, bringing spending to over \$1 billion per year (Mulrine, 2004). The average treatment costs available to men are approximately \$3,500, while treatment cost for women are dramatically higher (Gibson & Myers, 2000). For example, the average cost per cycle of in vitro fertilization (IVF) ranges between \$7,000 and \$15,000 (Wilcox & Rossi, 2002).

Some insurers may cover the full cost of diagnostic tests and treatment for infertility; however, it is far more common to not have insurance coverage for infertility (Kenigsberg, 2006). Approximately 85% of insured persons in the United States do not have policies covering IVF, thus forcing most couples to pay out of pocket for each treatment as most insurance

companies view infertility treatment as an elective procedure (Gibson & Myers, 2000). In other cases, health insurance will cover IVF but will refuse to cover far less expensive low-technology methods of treatment often involving male-factor infertility (Fisch, 2005). Fortunately, more medical loans and shared risk programs for infertility are becoming available each year, granting patients a partial or full refund if the treatment is unsuccessful (Kenigsberg). Fertility clinics have also taken steps to help the patients financially by offering incentives such as multiple IVF attempts for a single fee and money-back guarantees (Mulrine, 2004). It is very important for couples to research not only their own insurance coverage, but also existing programs to provide financial assistance while progressing through various treatments. Research, planning, and an analysis of anticipated costs can help to offset the financial strain couples often experience through this process.

### **Adoption and the Choice to Remain Childless**

The myriad of treatment options for infertility has made pregnancy possible for many women unable to conceive on their own. Unfortunately, for 30% - 40% of infertile couples, the only option for becoming parents is to adopt a child (Corson, 1999; Daniluk & Hurtig-Mitchell, 2003). It is estimated 81% of couples adopting a child do so after a struggle with infertility (Ivaldi, 2000). This statistic makes it clear that infertility and adoption are often closely linked. For many couples, adoption can provide a way to alleviate the negative impact of infertility and create the potential to fulfill the dream of having a family (Daniluk & Hurtig-Mitchell). Letting go of the hopes of being biological parents in favor of becoming adoptive parents can be a difficult task and is not always achieved (Daly, 1990). However, research has found that once a couple has made a conscious decision to adopt, the biological/genetic link to the child is no longer an important factor in parent-child bonding (Akker, 2001a).

Adoption can involve a long waiting process during which agencies attempt to create the best match between baby and parents while also keeping the best interest of the birth mother and/or father in mind (Cudmore, 2005). The evaluation process by adoption professionals can be long and complex with no guarantee of receiving a child in the end and at times an indefinite waiting period (Holditch-Davis et al., 1999). The process is often extended due to the limited number of babies available for adoption in the United States. Potential parents must decide if raising a child from birth rather than later in life is more important to them than having a family of any kind.

Although adoption can create hope, it can also become an emotionally complicated experience for couples. With an adopted child also comes a significant amount of loss felt by the adoptive couple as well as the biological mother or parents who have chosen to give up their child (Cudmore, 2005). Couples must grieve the loss derived from their infertility and the expectations they once had about their ideal family. This proves difficult, especially for women, and a history of infertility has been associated with risk factors such as parenting problems and depression in the woman (Berg & Wilson, 1991). It is extremely important for a woman to fully transition through the grieving process before receiving a child through adoption as her ability to form a secure, healthy attachment with the adoptive child could be compromised if she has not resolved her feelings and moved on from her infertility experience.

Adoption represents a wonderful alternative to biological parenthood for infertile couples; however, some infertile couples make a choice to remain childless, coming to this decision after exhaustive, yet unsuccessful, efforts in both infertility treatment and the process of adoption. Others make this decision at some point during the treatment process. The difficulty in making this decision is not only the reality of giving up the dream of parenthood, but also

managing the social views and pressures they will experience from those around them. The social view of infertility and the importance of parenthood will be discussed later in the literature review.

### **Emotional Impact of Infertility**

#### **Impact on the Woman**

In most cases, women endure a greater burden during infertility than men, as they bear most of the responsibility for treatment (Gibson & Myers, 2000; Watkins & Baldo, 2004). Women generally endure the greater physical impact during infertility, with a multitude of tests, drug treatments and surgical procedures. In addition, they experience the pain of miscarriage and the reality of a menstrual period each month as treatments fail (Watkins & Baldo, 2004). They can experience transformations in their body image, self confidence and general emotional well-being (Imeson & McMurray, 1996). It is also not uncommon for women during this time to deny their desire for children to friends and family members (Cudmore, 2005). This is often done in an attempt to avoid conversations about children and hide their experience of infertility from those around them.

Women tend to be at a greater risk for psychological disruptions as result of infertility than men and find the treatment process more difficult to manage (Holditch-Davis et al., 1999). In fact, a study reviewed by Edelmann and Connolly (1998) found that 50% of the women interviewed about their infertility experience felt it was the most upsetting experience of their lives. As a result of infertility, women often experience a lack of control, feelings of helplessness, and an overall heightened degree of emotional distress (Eunpu, 1995). Stress during infertility can have a significant impact on psychological functioning as well as physical health. In fact, the stress experienced during infertility, especially by the woman, can take such a physical toll that it can negatively impact the chance of conception (Eunpu, 1995).

The incidence of depression among infertile women is substantially higher than fertile women (Holditch-Davis et al., 1999). One contributor to feelings of depression is the overwhelming sense of loss experienced during this time. This loss is similar to the grief experienced after the loss of a loved one, as it not only represents the loss of a potential child and dream of parenthood, but also loss of self due to the decline in self-esteem, self-confidence, security, and perception of health (Dayus et al., 2001; Eunpu, 1995; Gibson & Myers, 2000). Other losses felt include loss of body functioning, personal identity, and genetic heritage of a potential child (Stephenson, 1992; Gibson & Myers, 2000). These feelings of loss tend to increase proportionately to the length of time spent in treatment (Salakos et al., 2004). Other contributors to depression are the physical changes the woman experiences as she is given a multitude of hormone-stimulating medications. These medications are used not only as an initial treatment for infertility, but are also used in conjunction with almost every common treatment thereafter including insemination and ART. Side effects of medications often include headaches, nausea, mood swings, emotional outbursts, and distractibility (Watkins & Baldo, 2004). Each of these can significantly alter one's emotional well-being and lead to a greater risk of depression.

The types of psychological distress described above are generally experienced at similar levels by both men and women as a result of male or female-factor infertility (Holditch-Davis et al., 1999). There is, however, variation dependent upon a woman's age. Younger women tend to experience higher levels of stress than older women, especially if there is an unknown cause of infertility (Watkins & Baldo, 2004), possibly because older women feel a greater sense of acceptance over circumstances beyond their control (or maybe having other arenas of their lives than possible motherhood in which they have experienced accomplishment). Psychological impact also seems to vary in accordance with length of treatment. The longer treatment is

extended without success, the higher the degree of experienced stress (Salakos et al., 2004). It might be presumed that impact could also vary depending on the type of treatment used. It is, however, difficult to substantiate this assumption as there is little research comparing the psychological impacts of treatment. This would be difficult to discern as treatment modalities are not necessarily attempted in a linear order, but rather are used based on diagnosis. Given the demanding nature and significantly higher cost of IVF treatment, one might believe that this type of treatment would generate greater levels of stress (Merari et al., 2002). Still, there is no existing evidence supporting this notion and it should be noted that the stress could be attributed more to the meaning associated with childlessness than to the physical process of treatment.

### **Impact on the Man**

In infertile couples, the man's experience is often overlooked and undervalued, as most medical and emotional attention is focused on the woman. This is surprising, considering that one study found 40% of infertility in couples can be attributable to the male partner (Hart, 2002). It is important to recognize that men are significantly affected by infertility, whether they, or their partner, are the reason for the infertility. There is little focus placed on the impact of infertility on the man because men's and women's reactions often differ significantly. Though the male experience is not a part of this study, it is important to include this perspective in this literature review in order to have an accurate comparison between the male and female experience.

Typically, men's reactions to infertility include avoidance and denial (Abbey, Andrews, & Halman, 1991). These reactions often result in a failure by men to seek supportive relationships during this time, which can be a main predictor of marital discord (Band, Edelmann, Avery & Brinsden, 1998). There are several possible reasons for this behavior, one of which is shame. It has been found that in cases where infertility is attributable to the male,

shame and devastation ensued (Cudmore, 2005). Reports of feeling “less of a man” or “shooting blanks” were common among those sampled. In some cases, female partners took responsibility for the infertility to spare the man the humiliation of sharing that information with family members and friends. In other cases, the male’s masculinity was challenged to the degree that feelings of powerlessness arose, resulting in episodes of impotence or even promiscuity (Syme, 1997).

### **Impact on the Couple**

Infertility places a great deal of stress and demand on the couple relationship (Dayus et al., 2001). It has been found to decrease satisfaction in the marital and sexual relationship, increasingly after the second year of treatment (Holditch-Davis et al., 1999). It represents a developmental crisis faced by couples that affects every area of their lives and is often their first crisis faced together as a couple (Eunpu, 1995). This type of crisis can dislodge short and long-term life plans and expectations for the couple (Hunter, 1994). It can be seen as a threat to the relationship that has no clear solution and has the ability to bring out unresolved issues from the couple’s past.

Couples experiencing infertility react individually, and together as a couple, in a variety of ways. Some couples feel a sense of isolation from their normal support system. At times, each partner can also feel isolated from the other due to a lack of understanding, communication, and overall stress (Eunpu, 1995). Some individuals begin to question their desire to remain married without children (Field & Marck, 1994) In some cases, infertility can bring out an increase in acting-out behaviors such as adultery, substance abuse, and eating disorders (Eunpu, 1995). The common goal of these behaviors is to regain control over their lives and find pleasure in areas where it has been lost due to reproductive difficulties (Myers & Wark, 1996). Couples who do not properly address their feelings and needs during this time may face severe

consequences. For example, the rate of suicide and divorce for childless couples is double that of couples with children (Eunpu, 1995; Smith & Smith, 2004).

After long periods of treatment, both women and men can experience significantly high levels of depression and dissatisfaction in their relationship (Schmidt, 2006). The frustration experienced with each failed treatment contributes to the level of stress, as does the amount of time spent on exams and treatment, the financial burden, and the decision of when to stop treatment (Watkins & Baldo, 2004). Throughout the process, if one partner places blame on the other for their infertility, distress between them can further increase (Watkins & Baldo, 2004).

Communication within a couple plays a vital role in the stability of the relationship. Because infertility is sometimes the first major crisis a couple has faced, they may not have had enough time to establish good communication and conflict resolution patterns between them (Eunpu, 1995). When one partner isolates him or herself from the other, diverting their energy to family of origin or career, the other partner may disengage, further increasing the amount of stress on the marriage (Myers & Wark, 1996). Another common problem in communication is the difference in gender response. Often, a woman finds comfort in verbally expressing her pain and sadness with her partner. When her husband feels uncomfortable with this type of exchange, he may withdraw emotionally, creating heightened stress for himself and feelings of isolation for his wife (Eunpu, 1995).

The sexual relationship shared within the couple may be significantly impacted during infertility. Treatment often results in a loss of affection and closeness during intimacy, replacing it with chronicling and scheduling of intercourse for the sole purpose of conception (Eunpu, 1995). The pressure on the sexual relationship and loss of privacy can easily result in a decrease in desire and male or female sexual dysfunction (Watkins & Baldo, 2004). Infertility can begin

to make each individual feel sexually inadequate and defective, losing a connection with their sexual identities (Myers & Wark, 1996).

Although infertility can be traumatic for some couples, it can bring others closer (Mulrine, 2004). Couples who have shown the least amount of disruption to the marital relationship have reported higher self-esteem, increased marital satisfaction, acceptance of the reality of their infertility and ability to reframe the problem (Watkins & Baldo, 2004). In fact, the greatest predictors of marital stability through infertility include marital commitment, nature of decision-making, coping skills, and intimacy (Myers & Wark, 1996). Couples who are strong in each area may actually strengthen their marriage through the crisis of infertility.

### **Coping Mechanisms**

The coping mechanisms used by individuals and couples through the infertility experience can have either a positive or negative impact. Positive, healthy coping mechanisms promote good communication, strengthen the system of support, and allow for easier decision making. Negative coping skills can break down communication and bring on higher levels of stress, anxiety, and dissatisfaction.

A positive coping mechanism often seen in women experiencing infertility is the seeking of emotional support. The woman creates a support circle often centered on the husband, but also extending to family members as well as other women who have shared in the experience (Merari et al., 2002). Emotional expression is another positive mechanism that has actually been associated with success of treatment. Planful problem-solving, positive reappraisal and approach-oriented coping are other positive mechanisms that tend to predict better adjustment to infertility and are most associated with females (Schmidt, 2006). In a quantitative study by Merari et al. (2002), it was found that coping mechanisms of repression and denial of the infertility experience are associated with higher levels of anxiety and can sometimes have a

negative impact on the clinical treatment. Other mechanisms with negative impacts include avoidance and failure to communicate (Schmidt, 2006). These findings suggest that the need for healthy and effective coping skills is high for both individuals and couples experiencing infertility as they play a vital role in the development of emotional balance, acceptance, and adjustment.

### **Social Views of Infertility**

#### **Social Context Influences**

Most available research has examined the physiological aspects of infertility and overlooked the emotional experience as well as the established meanings surrounding the experience (Imeson & McMurray, 1996). In focusing on individual experience, the research literature has also failed to examine how the individual impact of infertility affects the marital relationship (Peterson et al., 2003). In addition, there is little to no research focusing on the impact on the extended family members of infertile individuals and couples. It is noteworthy that few of the major textbooks on marital counseling discuss infertility as a relevant issue within the marital relationship (Eunpu, 1995). In the context of treatment, very few researchers have discussed the emotional experience for couples of engaging in IVF treatment despite the fact that it is the most extensive and expensive process of all available treatments (Glazebrook, Cox, Oates, & Ndukwe, 1999). These facts make the need for research on the emotional impact of infertility and treatment apparent. For women, the impact can be severe because women most often take on the physical and psychological burdens of fertility treatment. Existing research on the physiological and medical aspects of the infertility experience and process provides a great deal of knowledge for professionals and couples. However, it is also important for couples, families, therapists, and medical personnel to be aware of how the emotional reactions involved

can impact an individual and the couple relationship, as well as the possible success of treatments.

### **Lack of Support**

One of the most difficult aspects of infertility and treatment is the social isolation experienced by the couple. The subject of infertility is often kept secret and it is difficult to cope with the social pressure from friends and family to have children (Imeson & McMurry, 1996). Many couples may not feel comfortable sharing their infertility experiences with those in their supportive circles, relying solely on the support within the couple (Hart, 2002). It seems most infertile couples resist publicizing their experience with infertility. An estimated 3.5 million couples progress through infertility testing and treatment without the support of their families and social systems (Myers & Wark, 1996). Couples often feel misunderstood by friends and family members. Due to the lack of understanding from their support system, many couples believe their friends and family would not know what to say if the issue of infertility was discussed (Watkins & Baldo, 2004). Without this support, the emotional load of infertility can take a significant toll on the couple. It is important for counselors working with infertile women and couples to be aware of these statistics and appreciate their vital role in the emotional health of their clients.

The lack of social support from family members and friends for infertile couples is somewhat expected by those choosing to keep their infertility private. It often comes as a surprise to also find a lack of support among the medical professionals involved with the infertility treatment. Occasionally, infertile couples will work with staff of a fertility clinic who encourage the couple to reflect upon their experience and discuss feelings of grief or failure when treatments are unsuccessful. Unfortunately, most fertility clinics do not offer these services (Cudmore, 2005). It is important to recognize that the goal of medical personnel is to

cater to the medical needs of the patient and not the emotional needs. Although this is an important distinction, the lack of research in the area of emotional response to infertility and need for emotional support are also contributors to the lack of support. Medical personnel cannot address an issue with their patients they know little about. It is important for research to be conducted in this area and be made available to medical personnel working directly with infertile women and couples.

### **Cultural Expectations and Social Stigma**

Regardless of how far society has come in accepting alternative families, societal expectations for women and men are still to marry and then procreate biologically and naturally (Akker, 2001b). The term, pronatalist ideology, was developed to capture this belief. Pronatalist ideology is defined as “the belief that a person’s social value is linked to procreation” (Parry, 2005; p. 337). Though it is a term used to describe the impact on men and women, its assertions are more often aimed at women, since women consistently experience a greater degree of pressure to bear and/or raise children (Fisher, 1992). Our culture places great value on a person’s ability to produce or create a child. Women may consider their bodies to be unproductive due to infertility and they see themselves as social failures (Jones, 2001). Even the Bible takes a stance on the importance of parenthood, instructing people to go forth, multiply, and have children. These statements may seem dramatic but they contribute to the pressure felt by women to be fertile (Watkins & Baldo, 2004). Many women have reported that when faith-based or socially-based messages such as these were spread in their presence, they were left feeling cursed, insignificant, uncomfortable, and experienced psychological distress (Smith & Smith, 2004).

The last four decades have brought a significant shift in the expectations, rights, and roles of women in society. Still, bearing children and becoming a mother is emphasized as an

important, if not primary role for women in society (Jordan & Revenson, 1999). Females are socialized from childhood to be mothers more than any other social role (Stephenson, 1992). Parenthood is considered a desirable social standard by most people as a way of promoting family heritage and abiding by the traditional view of what a family should be (Dayus et al., 2001). After the first year of marriage, couples often experience pressure to have children and this only increases by the third and fourth year (Gibson & Myers, 2000). Some women try to conceal their struggle by denying the desire for children and involving themselves in other interests or avoiding social gatherings (Hart, 2002).

Infertility prevents couples from achieving the social standard of a traditional family. As a result, the embarrassment, shame, and guilt they feel about not being able to conceive on their own often discourages them from socializing with couples with children or attending family events (Merari et al., 2002). Just the sight of parents and children together, combined with the social pressure to create the same ideal, can be overwhelming. In turn, childless women are often excluded from events involving children, leading to an involuntary separation from social support (Imeson & McMurray, 1996). The social stigma of infertility and childlessness often leads to feelings of a spoiled identity inadvertently guiding couples into social isolation (Hart, 2002).

Infertility is not only a cause of stress and frustration, but it also includes a great deal of pressure and secrecy for many couples. The social stigma of infertility is often great enough that couples will choose to keep their method of conception a secret from many, if not all, of their friends and family. In a study of British families using embryo donation, two-thirds of the parents reported they had no intention of revealing conception details to their children because it was far more important to maintain the appearance of a natural pregnancy to the outside world

(Wren, 2004). It has also been observed infertile couples will reveal only those aspects of treatment which resemble ordinary and traditional family ideology (Akker, 2001b). This secrecy is cause for concern as it may result in detrimental effect on all involved with special concerns for the child if he or she were to learn of its origins accidentally.

### **Myths About Infertility**

A common misconception is that infertility rates have dramatically risen over the last few decades. In contrast, infertility rates have remained steady since the first infertility survey was administered in the 1960s, at a rate of 10-13% (Hart, 2002). Over the past 25 years, infertility rates among couples of childbearing age have been fairly stable (Meyers, Weinshel, Scharf, Dezur, & Rait, 1995). One explanation for this perceived rise in rates is that the diagnostic criteria has changed. Prior to 1975, patients were diagnosed with infertility after 5 years of unprotected intercourse (Meyer, 1997). In 1975, the criteria changed to 24 months, and later changed again in 1988 to 12 months by the Office of Technology Assessment (Meyer, 1997). In addition, infertility treatment has identified more individuals struggling with the issue than was possible in the past (Kenigsberg, 2006).

Another myth surrounding infertility involves the female assuming sole blame for the inability to conceive, an idea prevalent even in recent American culture (Watkins & Baldo, 2004). From the 1940s to the 1960s infertility was blamed on a woman's unconscious fear of sexuality, neuroses, psychological impairment, or ambivalence toward motherhood (Klempner, 1992). Theories behind this myth of neuroses or psychological impairment have attributed infertility to female emotional problems, claiming women were either too anxious or too conflicted to conceive (Smith & Smith, 2004). Along similar lines, women conceiving after adopting a child have been told the presence of a child in the home lessened the emotional disturbance of the woman allowing her to conceive naturally. In reality, similar percentages of

women conceive after adoption as those who continue to pursue treatment options eventually resulting in conception (Snarey, Son, Kuehne, Hauser, & Vaillant, 1987). It is important to realize that the causes of infertility are equally shared between men and women (Nordenberg, 1997). The notion is that men of all ages have an equal chance at fathering a child. This is simply not true. With an increase in age, males experience a decline in the amount and quality of their sperm (Fisch, 2005).

Myths about infertility also extend into areas such as religion and punishment. It has been alleged women delaying motherhood in favor of career aspirations suffer the consequence of infertility (Faludi, 1992). Infertility has also been viewed as a departure from standards of masculinity and femininity, an unseen disability, or worse yet, a curse from God (Greil, 1991). This curse or punishment from God might be attributed to a variety of decisions made within the couple's sexuality. For instance, some women may blame themselves for their infertility; feeling like they had had too many sexual partners in the past or perhaps it is a result of a previous abortion (Watkins & Baldo, 2004). In reality, previous termination of pregnancy is a highly unlikely cause of infertility (Kenigsberg, 2006).

### **Therapy for Infertility**

The need for therapeutic care through the process of infertility is high. In fact, it was reported by Schmidt (2006) that couples were typically satisfied with the level of medical care received but felt a need for greater patient-centered or psychosocial care. Women, specifically tend to seek out psychosocial support during infertility and feel it is one of the most important aspects of the process behind the actual treatment (Salakos et al., 2004). Although therapy is sought out more by woman than men, most couples find at least a few therapy sessions beneficial throughout the infertility process (Fisch, 2005). The benefits have been similar whether provided in an individual, couple, or group therapy basis (Kenigsberg, 2006).

Therapists fulfill a vital role for individuals and couples experiencing infertility. In some cases, therapy can serve as the primary outlet for women and couples to express their negative reactions to infertility (Myers & Wark, 1996). It can also create a safe environment for couples to express their fears and frustrations about the treatments, their relationship, and the choices they plan to make as individuals and as a couple (Watkins & Baldo, 2004). Therapists can help the couple to explore their sense of meaning in life and determine how their perspectives have changed since infertility (Watkins & Baldo, 2004). Therapy can also help to strengthen the sexual relationship and assist the couple in determining when to discontinue medical treatment for infertility (Eunpu, 1995).

Therapists working in the field of infertility must develop knowledge specific to the field such as the diagnostic and treatment modalities in current use, as these methods are continually changing with new research (Eunpu, 1995). Therapists must also be familiar with the financial costs of various procedures and testing as financial stress can take a significant toll on individual well-being and couple satisfaction. Therapists should have a keen sense of the gender differences of men and women with regard to emotional expression and attitude as these differences can lead to serious problems in communication within the couple (Merari et al., 2002).

Infertility can be addressed in therapy on an individual, couple, or group basis. Individual therapy for infertility generally focuses on building strengths, coping skills and psychological and emotional functioning (Eunpu, 1995). Couple therapy for infertility aims to strengthen communication and conflict resolution skills (Eunpu, 1995). Group therapy focuses on psychoeducation and skills-building (Schmidt, 2006). In any setting, it is important for the

therapist to assess for suicidality in each individual as there is a higher risk of this issue during infertility (Watkins & Baldo, 2004).

The ultimate goal of a therapist working with an infertile woman or couple is to help them through the stresses and sense of loss experienced so as to assist them to develop a greater sense of strength (Eunpu, 1995; Watkins & Baldo, 2004). This is achieved by focusing on several specific areas with their clients. Therapists should address the need for education about the experience as well as the typical reactions associated with infertility (Schmidt, 2006). This gives clients a greater sense of preparedness for what they might face. Therapists must also work with the individual and/or couple to help them maintain an emotional balance through treatment by developing open communication (Schneider & Forthofer, 2005). Building coping skills and stress management techniques will also contribute to a greater sense of balance and acceptance. The therapist should help the couple to establish a positive support system and social network to be a source of comfort rather than distress (Smith & Smith, 2004). One of the most important decisions couples face after deciding to begin treatment is to determine the ending point of treatment (Fisch, 2005). Therapists aid couples in this decision-making process and help them to consider a variety of implications. It is assumed that the incidence will increase in which therapists are sought by couples experiencing infertility treatment as both medical professionals and patients become further educated on the emotional effects of infertility on individual, couple, and physical well-being.

### **Summary**

Infertility represents a trying experience for women of both a physical and emotional nature. It challenges the woman's belief system, sense of self, role-identity, physical and emotional strength, and sense of security. Some women are able to find new strength in their experience, while others can easily break down. Statistics show that infertility affects a

significant number of individuals and couples. Because of its prevalence, it has warranted tremendous research, allowing for new technologies to embrace the struggle and challenge the natural outcomes. History has shown significant changes to the belief system associated with infertility as well as great strides in medical advances.

Infertility has a long list of causes that can be attributed to both female and male factors. In some cases, no known cause can be determined. Although we have seen a rise in the number of persons seeking infertility treatment in recent years, in all likelihood, this rise may be the result of women choosing to delay childbirth, as the actual rate of infertility among younger aged women has not changed substantially. The diagnostic process for infertility involves several phases and can be time-consuming and costly. Treatment options range from minimally-invasive drugs and procedures, to surgically-involved, high-tech methods of assisted reproduction. Each of these options comes with a variety of risk-factors, side effects, and significant costs, as well as ethical considerations. When treatment options come to an end, couples may decide to adopt a child or remain childless.

The emotional impact of infertility is significant for both individuals and couples, but tends to be greater among women. Often, partner's emotional responses are influenced by the social stigma surrounding infertility, misconceptions, and the importance of parenthood in our society. It is of benefit to individuals and couples to seek out therapeutic support during the infertility process in order to build positive communication patterns, establish healthy coping skills, and create a greater sense of balance and acceptance of their experience.

## CHAPTER 3

### METHODOLOGY

The purpose of the study was to investigate the influence of certain personal resources on the perceived individual well-being of women experiencing different fertility treatments. More specifically, the influences of perceived marital satisfaction, individual well-being, three coping styles, and three infertility-specific coping strategies were examined. This chapter presents the methodology used in the study including the design of the study, study variables, study population and sampling procedures, instrumentation, data collection and data analysis procedures, research hypotheses, and methodological limitations.

#### **Research Design and Relevant Variables**

A cross-sectional survey research design using comparative and correlational methods was employed for this study. A cross-sectional design refers to a study based on data gathered at one specific time, rather than a longitudinal study in which data are gathered over a period of time (Cherry, 2000). A cross-sectional study seeks to measure individuals in a variety of different developmental or age stages at one point in time rather than following the individuals over a number of years or a length of time. In this study, the responses of women of differing ages and at different stages of infertility treatment were examined.

An advantage of cross-sectional research is that sample attrition is not an issue, as the data are collected at one point in time (Gall, Gall, & Borg, 2006). While cross-sectional design research studies are simple in design and execution, they can yield important data and information about a phenomenon and inform future research (Gall et al., 2006).

Data was collected from the participants on ten study variables. These included the use of three coping styles (*Task* oriented coping, *Emotion* oriented coping, and *Avoidance* oriented coping); marital satisfaction; three types of infertility-specific coping strategies (*Space*; *Control*;

and *Beliefs*); the participant's age; number fertility treatments used; and the participant's individual well-being.

### **Coping Styles**

The coping styles of participants were measured by *The Coping Inventory for Stressful Situations (CISS)* (Endler & Parker, 1999), a 48-item scale measuring the three coping styles, *Task*, *Emotion*, and *Avoidance*. The *Task* oriented coping style subscale measures the emphasis the respondent places on tasks and use of planning and deliberateness in addressing problems. The *Task* oriented subscale consists of 16 items with a reported Cronbach alpha coefficient of .90 (Tirre, 2004). The *Emotion* oriented coping style subscale has 16 items and a reported Cronbach alpha coefficient of .86 (Endler & Parker). The *Emotion* oriented subscale items measure responses aimed at reducing emotional stress. Responses might include becoming overly emotional, getting angry, getting upset, or getting tense. The *Avoidance* oriented subscale consists of 16 items measuring mental changes and activities designed to avoid stressful situations. People might use distraction through engaging in unrelated tasks or social diversions or by removing oneself from the stressful situation by spending time with friends or other tasks. The *Avoidance* subscale has a reported Cronbach alpha of .82 (Tirre, 2004).

### **Marital Satisfaction**

Marital Satisfaction was measured by the *Index of Marital Satisfaction (IMS)* (Hudson, 1993). The *IMS* is a 25-item scale intended to measure the level of satisfaction reported in a marital relationship. *IMS* scores can range from 0-100 with lower scores indicating a higher level of satisfaction with the relationship due to the way the items are scored. The *IMS* has a high level of concurrent validity as well as strong evidence of known-groups validity and good construct validity (Touliatos, Perlmutter, Straus, & Holder, 2001). It has a Cronbach coefficient alpha of  $\alpha = .96$ , representing excellent internal consistency and a low standard error of

measurement at 4.0 (Touliatos et al., 2001). The *IMS* was used to assess the participant's perspective on their satisfaction with their marital relationship.

### **Infertility-Specific Coping Strategies**

The infertility-specific coping strategies used by women undergoing treatment were measured using the *Coping Scale for Infertile Couples (CSIC)* (Lee et al., 2000). The *CSIC* is a 15-item scale identifying particular coping strategies used to manage the stress of infertility. Coping strategies are divided into three subsections: *Space*, *Control*, and *Beliefs*. The *CSIC* utilizes a 5-point Likert-type response scale ranging from *Never* (1) to *Almost Always* (5). In this study, *Space* refers to how infertile women acted and reacted in various situations. *Control* describes the way infertile women control their lives and themselves. *Beliefs* are intentional strategies used to engage in behaviors that create a sense of being at their best. Reliability data for the *CSIC* can be found in Table 3-1.

### **Age**

Respondents were asked to provide their actual age in years. The study asked for age as a continuous variable so a mean could be calculated. Based on the age at which women typically marry and are most fertile, survey respondents were grouped into three age groups as follows: 18-29 (age group = 1), 30-33 (age group = 2), and 34 + years of age (age group = 3). For example, all of the female respondents reporting their age between 18 and 29 will be grouped in age group 1. The age group categories were established in order to most evenly distribute the data for analysis.

### **Infertility Treatment Stage/Group**

Treatment options recommended by physicians do not generally follow a predictable sequence from less to more invasive, due to variation in diagnosis and patient/doctor preference. Therefore, in order to best assess the intensity of the infertility experience for each participant,

Respondents were asked to provide the number of different fertility treatments used thus far. Number of treatments group used the reported count of treatments in each type of fertility treatment and the variable was treated as an interval or continuous level of measurement (see Appendix A). The number of treatments was summed to create a total number of treatments. There was no way to know in advance how many treatments women would report and the number might have ranged from as few as 1 to perhaps 20 or more. Based on the data, the number of treatments group was categorized as follows: 1 to 6 treatments (group = 1), 7 to 12 treatments (group = 2), and 13+ treatments (group = 3). These categories were created in order to most evenly distribute the data for analysis.

### **Individual Well-being**

An additional variable was the participant's individual well-being as measured by the *Mental Health Inventory-5 (MHI-5)*, a subscale of the *SF-36* (Ware & Sherbourne, 1992). Individual well-being consists of the self perceptions and level of stress and strain experienced by an individual (Gladding, 2001). Instructions ask the respondent to indicate how they have felt and how things have been during the past four weeks.

### **Population and Sample**

The population to whom this study was generalized were female adults of childbearing age (approximately 18-45) who are in legally married heterosexual relationships and are participating in infertility treatment. Boivin, Bunting, Collins, and Nygren (2007), estimated the prevalence of infertility to be between 3.5% and 16.7% in developed countries using multi-nation population surveys of 172,413 women. Stephen and Chandra (2000), using data from the 1995 National Survey of Family Growth (a representative survey of 10,847 women aged 15-44), found that 1,210 women at the time of the interview reported fertility problems. Multivariate statistical modeling was used to identify the characteristics associated with their use of infertility

services. Of the women who had obtained some form of infertility services, the most common services received by the women were: advice (60%), diagnostic tests (50%), medical help to prevent miscarriage (44%), and drugs to induce ovulation (35%) (Stephen & Chandra, 2000).

The most recent statistics from the National Center for Health Statistics (2009) reported 7.4% of married women (2.1 million) in the United States between the ages of 15 and 44 are infertile.

The total number of women in the age group who have ever sought treatment for infertility is 7.3 million.

Participants in the study were required to meet the following criteria. First, participants were required to have received a formal diagnosis of infertility from a physician according to the following definition of infertility: at least one year of unprotected intercourse without achieving conception (6 months if the woman is over age 35) (Hart, 2002). Participants were also required to be receiving some type of infertility treatment (drugs, surgery, or in vitro fertilization) under the supervision of a physician specializing in obstetrics and gynecology (OB/GYN) during the time of data collection. The fertility treatment required for participation in the study was either a low technology or high technology method of treatment or some combination of both. As discussed in Chapter 1, low technology methods refer to the use of fertility drugs and/or insemination whereas high technology methods include the use of in vitro fertilization, donor eggs or embryos, and/or surrogacy methods (Williams, 2000). Studies have shown that women experiencing infertility and undergoing fertility treatment of any type may experience elevated levels of stress (Edelmann & Connolly, 1998). This factor, combined with the potential for a number of different types of fertility treatments to be utilized by a particular participant, has led the researcher to examine the total number of treatments rather than the type of treatment.

## **Sampling and Study Participants**

A convenience sample was used in the study. Convenience sampling is a sampling method in which participants are selected for their accessibility, availability, and ability to meet the criteria for inclusion in the study (Gay & Airasian, 2000). Convenience sampling is a non-probability method of sampling and meets the purpose of the study and sets parameters for participation (Gall et al., 2006). Subjects were recruited to participate in the study using a convenience snowball sampling method. Snowball sampling occurs when a series of referrals are made among a circle of people with some type of common bond (Berg, 1988). When a study is examining a sensitive topic, this type of sampling method is particularly effective in locating members of a specific population (Hendricks & Blanken, 1992). It can be used as both an informal way of finding participants as well as a formal method of making inferences about the population of interest (Faugier & Sargeant, 1997).

Subjects were recruited from three different sources. First, patients from several obstetrics/gynecological (OB/GYN) practices and fertility clinics in southeast Florida were invited to participate during their scheduled visits to these facilities. Access to these facilities was gained through developing professional connections between the researcher and the staff physicians who share a common interest in research within the field of infertility. The study was explained to the OB/GYNs and nurses at each facility. Informational flyers developed by the researcher (see Appendices B and C) were distributed at these fertility clinics and cooperating OB/GYNs shared information about the study with their patients upon request. In exchange for participating in the recruitment of the study sample, these physicians are to receive a copy of the final results of the study.

A second method by which participants were recruited was through contact with local infertility support groups in Southeast Florida and in the southeastern portion of the United

States (see Appendices B and C). The third method of participant recruitment consisted of contacting members of Internet infertility support groups and Internet infertility resource websites (see Appendix D). RESOLVE ([www.resolve.org](http://www.resolve.org)) is one such online website providing support groups, educational programs, and opportunities to contact and meet with others experiencing infertility. RESOLVE offers local programs with opportunities to learn from professionals, hear personal stories, and explore options for addressing infertility. RESOLVE has organizations, professionals and volunteers across the United States. RESOLVE organizations in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina and Tennessee were contacted to solicit participants for the study. Several other internet support forums were contacted as well to solicit participation from chat room and online support group members. These forums included, but were not limited to, FertilityConnect.com, FertileThoughts.com, FertilityNeighborhood.com, FertilityTies.com, INCIID.org, DailyStrength.org, ConceivingConcepts.com, FCSupport.org, FertilityCommunity.com, AmericanPregnancy.org, Conceive.com, and TheAFA.org.

The proposed sample size for this study must have been of a size that would meet requirements for data analysis. Cohen (1992) posits researchers need to consider sample size so they obtain a sufficient number of study participants for the analysis to be effective. According to Cohen, using a multiple regression analysis with nine predictor variables requires a group of 107 to attain power = .80 and a medium effect size with a probability level of  $p = .05$ . The researcher also conducted a factorial MANOVA with the study data. According to Cohen (1992), 160 participants were needed to attain a power = .80, a medium effect size with a probability level of  $p = .05$ . Effect size refers to the size of the relationship between variables while power is a measure of the ability of the study to detect significant differences or

relationships, if there are any. Studies with a power of .80 have an 80% chance of identifying an effect if there is one (Cohen, 1992). Probability of  $p = .05$  is the criteria for accepting or rejecting the null hypothesis and making a Type I or Type II error in incorrectly accepting or rejecting the hypothesis. In other words, 95% of the time you would be correct in accepting or rejecting the null hypothesis. Based on Cohen (1992), the statistical analyses require the study to have a minimum of 134 participants.

## **Instrumentation**

The questionnaires or surveys used in the study were composed of four different instruments assessing the study variables. These were: (a) the *Coping Inventory for Stressful Situations* (Endler & Parker, 1999), (b) the *Mental Health Inventory-5 (MHI-5)*, (c) the *Index of Marital Satisfaction* (Hudson, 1993), (d) the *Coping Scale for Infertile Couples* (Lee et al., 2000), and (e) a demographic questionnaire (see Appendix A) developed by the researcher requesting general demographic information about the participant, as well as specific information regarding age, number of fertility treatments, and amount of time since trying to conceive. Each measure is described below.

### ***Coping Inventory for Stressful Situations***

The *Coping Inventory for Stressful Situations (CISS)* (Endler & Parker, 1999) is a 48-item scale measuring three coping styles. The *CISS* addresses *Task* oriented coping, *Emotion* oriented coping and *Avoidance* oriented coping. While Endler and Parker noted that the *Avoidance* coping subscale could be subdivided into distraction and social diversion subscales, the *Avoidance* subscale was conceptualized as one dimension in this study. The *CISS* utilizes a 5-point Likert-type response scale ranging from *Not At All* (1) to *Very Much* (5), asking respondents to assess how much they used a particular activity in dealing with a stressful or difficult situation. Norms for the *CISS* are reported as means and standard deviations for each

subscale for males ( $n = 249$ ) and females ( $n = 288$ ). Endler and Parker noted that normative data should be used cautiously in interpreting *CISS* scores when assessing individuals from specific cultures or contexts. The cultural or specific situational context needs to be taken into account when interpreting the scores and the context of women coping with infertility may be considered a unique cultural or situational context. The *Task* oriented subscale measures emphasis on tasks and using planning or deliberateness in addressing problems. The *Task* oriented subscale consists of 16 items with a reported Cronbach alpha coefficient of  $\alpha = .90$  (Tirre, 2004).

The *Emotion* oriented subscale has 16 items and a reported Cronbach coefficient alpha of  $\alpha = .86$  (Endler & Parker, 1999). The items in the subscale measure responses thought to be successful or unsuccessful in reducing stress oriented towards self. Responses might include becoming overly emotional, getting angry, getting upset, or getting tense. The *Avoidance* subscale consists of 16 items measuring mental changes and activities designed to avoid stressful situations. People might use distraction through engaging in unrelated tasks or social diversions or removing oneself from the stressful situation by spending time with friends or other tasks.

The *Avoidance* subscale has a reported Cronbach alpha of  $\alpha = .82$  (Tirre, 2004).

The developers of the *CISS* have reported construct validity through factor analysis and correlations with social desirability, the *Ways of Coping Questionnaire* (Folkman & Lazarus, 1988), the *Basic Personality Inventory* (Jackson, 1989), the *Beck Depression Inventory*, the *Minnesota Multiphasic Personality Inventory* (Hathaway & McKinley, 1989) and other personality inventories (Tirre, 2004). In reviewing the assessment, Tirre noted that the *CISS* was developed using sound instrument construction processes, had been tested for construct validity, and measures what it intended to measure as well as being grounded in theory. High scores in the subscale of *Task* oriented coping refer to the use of cognitive or behavior problem-solving

techniques used during stressful situations. Individuals scoring high in the area of *Emotion* oriented coping respond to stress with self-preoccupation, expressive outbursts, or imagination. *Avoidance* coping implies management of stress by relying on social support systems and distraction.

### ***Index of Marital Satisfaction***

Marital satisfaction refers to an individual's contentment or satisfaction in a marital relationship. Marital satisfaction includes the role that individuals play within the marital relationship, level of affection for one another, level of commitment to the relationship, and their level of happiness with these aspects. The *Index of Marital Satisfaction (IMS)* (Hudson, 1993) is a 25-item scale intended to measure the level of satisfaction in a marital relationship. The *IMS* uses a 7-point Likert-type response scale of *None of the Time* (1) *Very Rarely* (2), *A Little of the Time* (3), *Some of the Time* (4), *A Good Part of the Time* (5), *Most of the Time* (6), and *All of the Time* (7). *IMS* scores can range from 0 to 100 with lower scores indicating a higher level of satisfaction with the relationship due to the way the items are scored. The *IMS* will be used to assess the participant's perspective on their satisfaction with the marital relationship. The *IMS* was scored in accordance with scoring instructions (Hudson).

The *IMS* has a high level of concurrent validity as well as strong evidence of known-groups validity and good construct validity (Touliatos et al., 2001). It has a Cronbach coefficient alpha of  $\alpha = .96$ , representing excellent internal consistency and a low standard error of measurement at 4.0 (Touliatos et al., 2001). Fisher and Corcoran (2007) reported that the norming group for the *IMS* included single and married individuals, clinical and non-clinical participants, and students and non-students; however, no actual norms were available (Fisher & Corcoran). Concurrent validity was established through correlation with the *Locke-Wallace*

*Marital Adjustment Test* and “correlates poorly with measures with which it should not correlate, and correlates significantly with several measures with which it should correlate such as sexual satisfaction and marital problems” (Fisher & Corcoran, p. 112).

### ***Mental Health Inventory-5***

An individual’s well-being consists of the self perceptions and level of stress and strain experienced by an individual (Gladding, 2001). Individual well-being was measured using the *Mental Health Inventory-5 (MHI-5)* a subscale of the *SF-36* (Ware & Sherbourne, 1992). The mental health items were answered using a 5-point Likert type response scale of *All of the Time* (1), *Most of the time* (2), *Some of the Time* (3), *A Little of the Time* (4), and *None of the Time* (5). Instructions asked the respondents to indicate how they have felt and how things have been during the past four weeks. The *MHI-5* is scored in accordance with instructions (Ware & Sherbourne). The instrument developers have reported a Cronbach alpha of .88 for this subscale indicating a fairly high level of internal consistency (Ware, Kosinski, & Keller, 1994).

Other researchers have reported internal-consistency reliability coefficients ranging from 0.67 to 0.95 (Means-Christensen, Arnau, Tonidandel, Bramson, & Meagher, 2005). Validity studies have generally concurred with the meaning of high and low scores on the *SF-36* subscales (Ware, Snow, Kosinski, & Gandek, 1993). Previous studies have provided evidence of content, criterion, construct and predictive validity (Ware et al., 1994). The mental health subscale of the *SF-36* has been shown to be valid through factor analysis (Ware et al., 1993), changes in severity of depression (Beusterien, Steinwald, & Ware, 1996), drug treatment, and depression therapy (Coulehan, Schulberg, Block, Madonia, & Rodrigues (1997). The *SF-36* was normed on 2,474 individuals representative of the population and norms are available for different countries. Norms are reported as means and standard deviations (Kagee, 2001).

### ***Coping Scale for Infertile Couples***

Individuals use a variety of coping strategies to manage stressful situations. Women undergoing treatment for infertility rely on their coping strategies to ease the specific stressors infertility can produce. The particular coping strategies used by women undergoing treatment were measured using the *Coping Scale for Infertile Couples (CSIC)* (Lee et al., 2000). The *Coping Scale for Infertile Couples (CSIC)* (Lee et al., 2000) consists of 15 items utilizing a 5-point Likert type response scale of *Never* (1), *Rarely* (2), *Sometimes* (3), *Most of the Time* (4), and *Almost Always* (5). The *CSIC* was developed and initially tested in Taiwan. Four subscales were originally identified in this administration through factor analysis and expert panel and were named *Increasing Space*, *Regaining Control*, *Being the Best* and *Sharing the Burden*. The reported test-retest reliability was between .71 and .73. However, the participants used in this initial evaluation of the *CSIS* included both men and women who were residents of Taiwan. For the present study, with participants primarily from the United States, the Cronbach alphas using the original subscales were: *Increasing Space*,  $\alpha = .664$ , *Regaining Control*  $\alpha = .475$ , *Being the Best*  $\alpha = .310$ , and *Sharing the Burden*  $\alpha = .290$ . It appeared this arrangement of the items on the *CSIS* was not viable and further analysis would be necessary. It is possible the *CSIS* was originally written in Mandarin and might have lost some of the essence of the measure in translation and the present study did not use both genders.

The present study included only women and the majority of the women were located in the United States ( $n = 202$ , 89.0%). Thus, a factor analysis was completed to determine whether the items would remain in the same subscales with a different group of participants. A principal components factor analysis with a varimax rotation was completed and the findings indicate that there were three viable subscales with the items all loading at .30 and above on one and only one

factor or subscale (see Table 3-1). The items accounted for 10.71% of the variance. The first subscale or factor was the same as the original; however, the other factors were different from the original. Analysis of participant responses to items on the new subscales revealed that the Cronbach alphas increased (see Table 3-1) for the three subscales. Table 3-2 presents a comparison of reliability between the original scale and the present study's scale. Hence the subscales were renamed and used in further analysis. The first subscale was named *Space* and consisted of 5 items. The *Space* subscale was defined as how infertile women acted and reacted in various situations. The second subscale was named *Control* and consisted of 5 items. *Control* was defined as how infertile females control their lives and themselves. The third subscale was named *Beliefs* and consisted of 5 items. The *Beliefs* subscale was defined by what infertile women believed would help them deal with their infertility. The Cronbach alpha reliability coefficients improved and ranged from .664 to .610. While this is not high, reliability is relative and the alphas are acceptable for an instrument of this type. The items in the *CSIC* subscales were summed to create subscale scores and used in further analysis.

### **Demographic Questionnaire**

A demographic questionnaire (see Appendix A) was developed to collect descriptive information on study participants. This questionnaire gathered information about the individual traits and characteristics of each participant including age in years (continuous), ethnicity (categorical), level of education (categorical), income (continuous), location where the respondent is currently living (categorical), amount of time since first attempt at conception measured in months (continuous), and number of different types of fertility treatments used thus far (continuous). This information assisted the researcher in determining additional commonalities and differences among females experiencing infertility as well as grouping and describing the participants. Fertility treatment frequently ranges from less invasive to more

invasive; however, fertility treatment can also be dependent upon physician preference and/or patient request. While there are some general steps in the treatment of infertility, patients might request in vitro fertilization (IVF) prior to progressing through other treatment options simply to shorten the process and probably because they could afford the procedure. There may also be women coming to IVF treatment after years of fertility treatments or there may be women utilizing IVF for reasons other than infertility. Because the treatment options recommended by physicians may not follow a predictable sequence from less to more invasive, the total number of treatments experienced by the study participants will be assessed. The study asks participants (Yes/No) what type of treatment (medical education or counseling, medication/drugs/hormones, surgical repair, artificial insemination, sperm/egg donation, and/or in vitro fertilization) they had used and the number of times they had participated in the type of treatment (see Appendix A).

### **Data Collection Procedures**

During the last several decades, numerous innovations in survey design, data collection, and methodology have emerged, such as utilization of the telephone for data collection (Dillman, 2000). Along these lines are the more recent innovations of the computer and the Internet. Using the Internet to conduct surveys has the potential to change survey methodology once again. E-mail or Web surveys not only eliminate costs associated with postage, paper, mailing, and data entry, they also make it possible to overcome international boundaries, increase sample size, and significantly shorten the time required to collect data (Dillman, 2000). Learning the software necessary to construct an Internet system for collecting data can be time consuming and difficult (Dillman, 2000); however, the [www.surveymonkey.com](http://www.surveymonkey.com) website permits the researcher to format a survey fairly easily. This site also provides the ability to collect both text and numerical data and return the data in a format usable to the researcher. Internet surveys offer several advantages over traditional mailed paper and pencil surveys in both survey construction

and data collection. The researcher is able to format the background colors and font to make the survey more user-friendly. The researcher is also able to determine whether the respondent can skip questions or must answer all of them (<http://www.surveymonkey.com>). The respondent can provide informed consent by clicking a box and, since no names are used, all responses are confidential (<http://www.surveymonkey.com>). Respondents are able to complete demographic data, such as age, gender, ethnicity, and other information. The Internet also makes it possible to post the survey to different web sites to inform people interested in the topic that the survey is available. Examples of this might include: online support groups for infertility, women's interest web sites, and web sites addressing or containing information on infertility. As opposed to paper and pencil surveys mailed through the postal service, Internet surveys give the researcher control over which items and the number of items a respondent can see at any time (Dillman, 2000).

As a result there are several advantages to using web-based, or Internet surveys in research. Some of the benefits include the ability to gain access to large samples, low cost of implementation, and timeliness of data collection. Internet surveys also allow for access of hard-to-reach populations, such as the population examined by the present study (Whittier, Seeley, & Lawrence, 2004). Paper/pencil surveys can be cumbersome to complete, time consuming, and expensive. The researcher has no control over how the respondent completes the survey or the order in which items are completed. The respondent might complete a paper survey but neglect to return it or inadvertently skip items on the paper version.

In this study, both an Internet and a paper mode of delivery were available to study participants. Participants had the opportunity to choose the format most convenient and comfortable for them. According to Dillman (2000), this type of mixed mode survey provides the researcher with the ability to compensate for the weaknesses of each method used for data

collection. An entirely Internet-based survey might produce a high risk of survey error since the percentage of United States citizens with computer access may be as low as 67% (Dillman, 2000). It is important for the study to reflect an accurate view of the sample population, requiring that participants with or without computer/Internet access be given an opportunity to complete the survey.

The study was approved by the Institutional Review Board of the University of Florida prior to data collection to ensure the protection of study participants involved in the study. After receiving permission from directing physicians of OB/GYN practices and support from group facilitators, participants were recruited through fliers placed in the facilities. Participants were also recruited from Internet websites through online postings in Internet chat rooms (see sample posting in Appendix D), support groups, and bulletin boards with a link to the online research packet website. A flyer was also provided to group facilitators and participants to share and distribute containing the research packet web address for those potential participants who were more comfortable using an internet format to complete the survey. Anonymity was maintained throughout the recruitment process to ensure personal privacy for each participant.

Each participant who agreed to take part in the study was given access to either the online survey packet or the paper-based survey packet. Both survey formats included an introductory cover letter about the survey (see Appendix E), an informed/implied consent section (see Appendices F and G), and the survey questionnaire. This questionnaire was comprised of the measures discussed previously in addition to a demographic measure.

The informed consent section in each survey informed the participants of the risks and benefits of taking part in the study. Participants were not able to gain access to the online questionnaire without agreeing to the terms of the informed consent on the web page. Responses

to the questionnaire were anonymous to ensure truthfulness and more accurate responses.

Participant confidentiality was maintained at all times of the data collection and analysis periods.

Data was stored in the researcher's home office on an encrypted compact disc at the completion of the study and the disc will be destroyed after three years. Paper copies of the survey packet were to be mailed in a stamped addressed envelope to the researcher and electronic data was to be kept in an electronic format until being downloaded from the Internet website.

The data gathered in this study was analyzed using the Statistical Package for the Social Sciences v. 17 (SPSS). The data collected on-line was stored during the data collection phase in the survey website database. At the completion of data collection, the data was downloaded and transferred to SPSS. The data collected through paper-based surveys were to be manually entered into SPSS by the researcher and paper forms were to be stored separately from the consent forms. Consent forms and paper surveys were destroyed by using a cross cut shredder at the conclusion of the study and data kept in a digital format were to be destroyed at the end of three years.

### **Research Hypotheses**

The following research questions and hypotheses were addressed in this study.

RQ<sub>1</sub> Are there differences by age and stage of treatment in the styles of coping (*Task oriented, Emotion oriented, and Avoidance oriented*), levels of marital satisfaction, infertility-specific coping strategies (*Space, Control, and Beliefs*), and individual well-being of women engaged in infertility treatment?

HO<sub>1</sub>: There are no significant differences by age and stage of treatment in the three styles of coping (*Task oriented, Emotion oriented, or Avoidance oriented*), the levels of marital satisfaction, infertility-specific coping strategies (*Space, Control, and Beliefs*), or individual well-being reported by women engaged in infertility treatment.

RQ<sub>2</sub>: What influences do the three styles of coping (*Task* oriented, *Emotion* oriented, or *Avoidance* oriented), the level of marital satisfaction, the three infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), the number of fertility treatments, or the woman's age have in predicting the level of individual well-being of women engaged in infertility treatment?

HO<sub>2</sub>: There is no significant contribution made by each style of coping (*Task*, *Emotion*, and *Avoidance*), the level of marital satisfaction, infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), the number of fertility treatments, or the woman's age to the prediction of the level of individual well-being of women engaged in infertility treatment.

### **Data Analysis**

The data analysis for the study consisted of the following steps. First, descriptive statistics (mean, median, mode, and frequency) were computed for the sample demographics and the study variables. Second, Cronbach's alpha reliability coefficients were calculated for each of the total and subscale scores of the *CISS*, *IMS*, *MHI-5*, and *CSIC* to assess the internal consistency of these instruments. Once the preliminary data analysis had been completed and the subscales determined to be valid and reliable, the items in the subscales were summed to create subscale scores. The calculated subscale or total scale scores were used in all further analysis.

The first research question posed in the study asked whether there were differences in the responses of different age groups of women participants or among women at different stages of infertility treatment on the subscale scores of the *CISS*, *IMS*, *MHI-5*, and the *CSIC*. The independent variables were number of treatments and age. The dependent variables were *CISS*, *IMS*, *MHI-5*, and *CSIC* scores. A probability level of  $p = .05$  was used as the criteria for accepting or rejecting the null hypothesis. The study asked women their age and this continuous variable was grouped into a categorical variable using fertility data from the American Society

for Reproductive Medicine (ASRM) (2003). The ASRM noted infertility increases with age and even though women are healthier, fertility still will decrease with age. The study asked for age as a continuous variable so a mean could be calculated. Based on the age at which women typically marry and are most fertile, survey respondents were grouped into three age groups as follows: 19-29 (age group = 1), 30-33 (age group = 2), and 34+ years of age (age group = 3). For example, all of the female respondents reporting their age between 19 and 29 were grouped in age group 1. Number of treatments group used the reported count of treatments in each type of fertility treatment and the variable was treated as interval or continuous level of measurement (see Appendix A). The number of treatments was summed to create a total number of treatments. There was no way to know in advance how many treatments women would report, as the number might have ranged from as few as 1 to perhaps 20 or more. Based on the data collected, the number of treatments groups was as follows: 1 to 6 treatments (group = 1), 7 to 12 treatments (group = 2), 13+ treatments (group = 3).

Since there are two independent variables and several dependent variables, a factorial multivariate analysis of variance (MANOVA) was used as the analysis to answer research question one. Like analysis of variance (ANOVA), MANOVA is designed to test the significance of group differences; however, MANOVA can include several dependent variables, typically measuring similar constructs. The assumptions of MANOVA are: observations are randomly sampled and independent of each other, the dependent variable follows a multivariate normal distribution, there is homogeneity of the covariance matrices or homoscedasticity, and there is a linear relationship between the dependent variables (Mertler & Vannatta, 2001). The assumption of independence is primarily a design issue. Multivariate normality implies the distribution of the means of each dependent variable and all linear combinations of dependent

variables are normally distributed. Univariate normality and bivariate plots were used to assess multivariate normality. It should be noted that multivariate normality is a condition of homoscedasticity and the Box test was used to assess homoscedasticity. There needs to be some degree of linearity between the dependent variables and they need to share some common conceptual meaning (Stevens, 1992). Linearity was assessed through the use of bivariate scatterplots. If both variables in a pair are normally distributed and linearly related, the shape of the scatter plot would be expected to be elliptical. Using several dependent variables allows researchers to obtain a more holistic view and a more detailed description of the topic under investigation. The idea stems from the concept that it is difficult to precisely separate out and measure specific traits and multiple measures of a common characteristic are more likely to be representative of the characteristic. It should be noted that ANOVA and MANOVA are fairly robust to violations of normality provided the violation is created by skewness and not by outliers (Tabachnick & Fidell, 2006). The results of the Box's test were used to test for homogeneity of the covariance matrices and if homogeneity is violated, the Wilke's statistic was used to interpret the results of the multivariate analyses.

The second research question asked whether age, *CISS* subscales (*Task*, *Emotion*, and *Avoidance*), *IMS* score, *CSIC* subscales (*Space*, *Control*, and *Beliefs*), and number of fertility treatments, predict individual well-being. Regression analysis was used to address this question. Regression analysis is not causal in nature and has as its purpose the development of an equation for predicting values on a dependent variable (DV) for members of a group. The independent variables were *CISS* scores (*Task*, *Emotion*, and *Avoidance*), *IMS* scores, *CSIC* scores (*Space*, *Control*, and *Beliefs*), age, and number of treatments; and the dependent or outcome variable was individual well-being. In multiple regression, a set of predictor variables (IVs) are selected as

potential predictors of a dependent variable, as is the case in this study. Multiple regressions are an extension of simple linear regression involving more than one predictor variable. It is used to predict the value of a single DV from a weighted linear combination of IVs. In this study, a series stepwise multiple regression analysis, or what is sometimes referred to as a statistical multiple regression, was used. When there are multiple predictor variables, a statistical multiple regression is used to determine which specific IVs make a contribution to the model (Mertler & Vannatta, 2001). Methods of regression include: forward, stepwise, and backward methods of entering and keeping variables in the model. In using a stepwise selection method, tests are performed at each step to determine the significance of each IV already in the equation as if it were the last to be entered. If a variable is entered into the analysis measuring much the same construct as another, a reassessment of the variables may conclude that the first variable is no longer contributing anything to the analysis. In a stepwise selection procedure, the variable would then be dropped out of the analysis even though it might have been a good predictor at one time. The variable may no longer be found to provide a substantial contribution to the model (Mertler & Vannatta, 2001). After ascertaining the data are appropriate for regression analysis and checking for multicollinearity, the multiple regression procedure was completed using a probability level of  $p=.05$  as the level of significance.

The first issue in multiple regression is the selection of a set of measures suitable for predicting the DV. One problem with the use of multiple regression analysis is the possible existence of multicollinearity. Multicollinearity is a problem arising when there are moderate to high intercorrelations among predictor variables. The problem lies with the possibility there may be two or more variables measuring essentially the same information (Glass & Hopkins, 1996). Not only do you not gain much by adding variables to a regression analysis measuring the same

thing, but multicollinearity can cause problems with the analysis itself. Stevens (1992) pointed out three reasons for why multicollinearity can cause problems: (a) multicollinearity limits the size of the R since the IVs are going after much the same variability in the DV; (b) multicollinearity can cause difficulty because individual effects are confounded when there is overlapping information; and (c) multicollinearity tends to increase the variances of the regression coefficients resulting in unstable prediction equations. The simplest method of diagnosing multicollinearity is to investigate high intercorrelations among the IV predictor variables. A second method is to inspect the variance inflation factor (VIF) (Mertler & Vannatta, 2001). VIF indicates whether there is a strong linear relationship between a predictor and all other predictors (Stevens, 1992). Stevens also notes there is no standard rule but VIF values greater than 10 are generally cause for concern. Hence, intercorrelations were computed for all variables and were checked to ensure multicollinearity does not present a problem in the analysis. If multicollinearity does exist, a variable may be deleted or variables may be combined to create a single construct. Variables correlated at  $r = .70$  and above should not be included in the same analysis and one variable would need to be omitted or a composite score created from the redundant variables (Tabachnick & Fidell, 2006).

The data for the regression analysis was also checked to ensure it met the assumptions of regression. These include: 1) the independent variables are fixed (the same values would be found if the study were replicated), 2) the IVs are measured without error, 3) the relationship between the IVs and the DV is co-linear, 4) the mean of the residuals for each observation on the DV is zero, 5) errors on the DV are independent, 6) errors are not correlated with the IV, 7) variance across all values of the IV is constant, and 8) errors are normally distributed (Mertler & Vannata, 2001). The assumptions were verified through examination of residual scatter plots,

assessment of linearity, inspection of normality through skewness, kurtosis, and Kolmogorov – Smirnov statistics, and inspection of the data using the Box's test for homoscedasticity. Multiple regression analysis served as the statistical analysis to be used for the second research question posed by this study and is appropriate for use in predictive studies.

### **Summary**

The purpose of this study was to explore the contributions of personal coping resources to the individual well-being of females undergoing infertility treatment, and to determine if there are differences by age and stage of fertility treatment in women's personal coping resources and individual well-being. A sample of women who were being treated for infertility was drawn from OB/GYN practices and fertility clinics in South Florida as well as from local and Internet infertility support groups. Participants were given the option to complete a paper-and-pencil or Internet-based survey that includes the *Coping Inventory for Stressful Situations*, The *Index of Marital Satisfaction*, the *Mental Health Inventory-5*, the *Coping scale for Infertile Couples*, and a demographic questionnaire. Data were analyzed using MANOVA and multiple regression analyses. The results of the study are presented in Chapter 4 and conclusions from these results are discussed in Chapter 5.

Table 3-1. Factor Loadings for Coping Scale for Infertile Couples

		<i>Space</i>	<i>Control</i>	<i>Beliefs</i>
3	I stop attending get-togethers filled with children	0.706		
2	I stop attending baby showers	0.672		
5	I don't discuss my inability to conceive with my family or relatives	0.636		
1	I keep myself very busy to forget the fact that I don't have a child	0.624		
4	I don't discuss my inability to conceive with anyone other than my spouse	0.599		
12	I try to change the places, position, and times when I engage in sex with my spouse in order to increase sexual pleasure		0.681	
13	I confide my feelings to my spouse and try to understand how my spouse feels		0.646	
10	I continually remind myself not to get depressed and to have hope for a successful pregnancy		0.644	
11	Although I cannot control my infertility, I keep myself in the best condition by controlling my weight, diet, and appearance		0.694	
9.	I keep a positive attitude and a positive discourse with myself.		0.466	
14	I wear sexy underwear to create a romantic environment		0.647	
8	The reading related to infertility let me know that some of the emotions I feel are typical for infertile patients.		0.621	
6	I read as much as possible from books on infertility		6.217	
7	I believe the more I know, the more I can deal with my problem.		0.560	
15	I confide my frustrations, disappointments, fears and hopes with other infertile parents.		0.421	

Table 3-2. Comparison of Lee Study and Current Study Reliability

Lee Study Scales	Current Study-		Current Study Scales	
	Lee Scales Reliability Alpha	Reliability Alpha	Scale	Reliability Alpha
Increase space	.78	.664	<i>Space</i>	.664
Recognize emotions	.71	.475	<i>Control</i>	.627
Being the best	.73	.310	<i>Beliefs</i>	.610
Share burden	.72	.290		

## CHAPTER 4 RESULTS

The purpose of the study was to examine the contribution of three styles of coping, marital satisfaction, three infertility-specific coping strategies, age, and treatment stage in predicting the individual well-being of married females experiencing infertility. The study also identified differences in coping processes, marital satisfaction, and individual well-being for women at different stages of infertility treatment. In this chapter, the results from the survey of a total of 282 married women experiencing infertility are presented. First, the respondents participating in this study are described. A discussion of the methods used to analyze the data produced by this survey is followed by the descriptive statistics for the study variables. Lastly, the study's research questions are addressed through a presentation of the results of the data analyses.

### **Sample Demographics**

A total of 430 women began the survey by accepting the informed consent. Of that group, 282 women opted to begin the survey; however, only 236 of the participants completed all of the survey in its entirety. Participants were not required to answer every question and some participants chose not to respond to all of the items. Participants were asked to provide information about their age, level of education, ethnic/cultural identification, income and location. Participants were also asked to provide information specific to their experience with infertility. This information included the amount of time that had elapsed since first attempting conception, the amount of time since they first recognized their infertility problem, the amount of time since they first sought a diagnosis of infertility from medical personnel, and the amount of time spent receiving treatment for infertility. Also included in this infertility-specific demographic information was information on the types of fertility treatment used by the

participant as well as the number of times each of these types of treatments were used. The study flyer and internet posting advertised the study specifically to married females who were currently receiving treatment for infertility and each of these specifications were presented in bold font. Therefore it was assumed by the researcher that all participants were married females who were currently receiving treatment for infertility. Table 4-1 provides descriptive data for study participants.

### **Age**

Participants ranged in age from 19 to 48. The average age of respondents was 31.94 ( $SD = 4.791$ ). Table 4-2 presents the frequency of participants by age. Participants were grouped into three age groups as follows: 19-29 (age group = 1), 30-33 (age group = 2), and 34+ years of age (age group = 3). The majority of participants were in age group 2 (30-33) (39.1%,  $n = 100$ ). The next most common age group was group 3 (34+) with 31.3% ( $n = 80$ ), followed by group 1 (19-29) with 29.7% ( $n = 76$ ). A total of 26 participants did not report their age.

### **Income**

The household income level reported by participants ranged from \$5,000 per year to \$1,000,000 per year. The average income of respondents was \$109,995.74 per year ( $SD = 99788.301$ ). Frequency of participants by reported income is presented in Table 4-3. Participant income was categorized into six groups: \$0 - \$29,000 (group 1), \$30,000 - \$59,000 (group 2), \$60,000 - \$89,000 (group 3), \$90,000 - \$119,000 (group 4), \$120,000 - \$149,000 (group 5), and \$150,000+ (group 6). The majority of participants had incomes that placed them in group 3 (29.2%,  $n = 69$ ). The remaining participant income responses were divided between group 4 (21.2%,  $n = 50$ ) and group 6 (19.1%,  $n = 45$ ). Groups 2 and 5 equally accounted for 13.6% ( $n = 32$ ) of participant income level responses, while group 1 accounted for 3.4% ( $n = 8$ ) of income level responses. A total of 47 participants did not report their household income.

## **Level of Education**

There was a wide range of educational levels among participants with the majority reporting a 4-year Bachelors Degree (35.9%,  $n = 94$ ). The next most common response was a Masters Degree (26.3%,  $n = 69$ ), followed by Some College (did not graduate) (10.7%,  $n = 28$ ), Associates Degree (9.2%,  $n = 24$ ), and an equal number who indicated they had earned a High School Diploma or a Professional degree (e.g., J.D., M.D., etc.) (5.3%,  $n = 14$ ). The remaining participants reported their level of education as Doctoral (Ph.D., Ed.D., etc.) (3.8%,  $n = 10$ ) and Specialists Degree (3.4%,  $n = 9$ ). Table 4-4 presents the frequency of participants' education level. Twenty participants chose not to provide their level of education.

## **Ethnic/Cultural Identification**

The majority of the sample reported their ethnic/cultural identification as Caucasian (89.2%,  $n = 231$ ), followed by Mixed Cultural/Ethnic (3.1%,  $n = 8$ ), an equal number of Hispanic and Asian/Pacific Islander (2.3%,  $n = 6$ ), African American (1.2%,  $n = 3$ ), and Caribbean (0.4%,  $n = 1$ ). The remaining participants reported their ethnic/cultural identification as Other (1.5%,  $n = 4$ ). Table 4-5 presents the frequency of participants by ethnic group. Twenty-three participants chose not to identify their ethnic/cultural background.

## **Location**

The locations of participants were diverse, reaching a wide range of areas in the United States as well as several international locations. The researcher divided the participants' locations into 10 groups based on their region. The regions used to group participants were: (a) New England, (b) Mid-Atlantic, (c) East North Central, (d) West North Central, (e) South Atlantic, (f) East South Central, (g) West South Central, (h) Mountain, (i) Pacific, and (j) International. The states included in the New England group were Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. The states comprising the Mid-

Atlantic group included New York, Pennsylvania, and New Jersey. The states in the East North Central group included Wisconsin, Michigan, Illinois, Indiana, and Ohio. The states comprising the West North Central group included Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, and Iowa. The states in the South Atlantic group included Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. The states in the East South Central group included Kentucky, Tennessee, Mississippi, and Alabama. The states in the West South Central group included Oklahoma, Texas, Arkansas, and Louisiana. The states in the Mountain group included Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico. The states in the Pacific group included Alaska, Washington, Oregon, California, and Hawaii. Participants from locations outside of the United States were placed into the International group. Of the 227 participants who reported their location, 4.8% ( $n = 11$ ) were in the New England group, 11.5% ( $n = 26$ ) were in the Mid-Atlantic group, 11.9% ( $n = 27$ ) were in the East North Central group, 8.4% ( $n = 19$ ) were in the West North Central group, 25.1% ( $n = 57$ ) were in the South Atlantic group, 6.2% ( $n = 14$ ) were in the East South Central group, 5.3% ( $n = 12$ ) were in the West South Central group, 3.5% ( $n = 8$ ) were in the Mountain group, 12.3% ( $n = 28$ ) were in the Pacific group, and 11% ( $n = 25$ ) were in the International group. Fifty-five participants did not provide a response for their location.

### **Fertility Treatments Used**

Participants were asked to identify the fertility treatments they have used and how many times each of those treatments were used. Table 4-6 provides descriptive data for participants' use of fertility treatments. These treatments included Medical Education and/or Counseling, Medication/Drugs/Hormones, Surgical Repair, Artificial Insemination, Sperm/Egg Donation, and In Vitro Fertilization. Fifty eight percent ( $n = 145$ ) had received Medical Education and/or

Counseling. Of this group, 25.6 % ( $n = 34$ ) had received this treatment 1 time, 24.1% ( $n = 32$ ) had received this treatment 10 or more times, 16.5% ( $n = 22$ ) received this treatment 3 times, 15% ( $n = 20$ ) had received this treatment 2 times, and an equal 6.8% ( $n = 9$ ) had received this treatment 4 and 5 times. Of the remaining participants who had used Medical Education and/or Counseling, 3.8% ( $n = 5$ ) had used the treatment 5 times and 1.5% ( $n = 2$ ) had used it 8 times. Thirty-two participants chose not to provide a response for their use of Medical Education and/or Counseling. Table 4-1 provides the descriptive data for infertility treatments.

The next treatment option to choose was Medication/Drugs/Hormones. Two hundred fifty two participants chose to answer this question and 88.9% ( $n = 224$ ) responded that they had received this treatment. Of those who had received this treatment, 25.2% ( $n = 55$ ) had received the treatment 10 or more times, 15.6% ( $n = 34$ ) had received it 3 times, 14.2% ( $n = 31$ ) had received it 1 time, 10.6% ( $n = 23$ ) had received it 4 times, 10.1% ( $n = 22$ ) had received it 2 times, and 7.3% ( $n = 16$ ) had received it 5 times. Six percent ( $n = 13$ ) of participants had received the treatment 8 times, followed by 5% ( $n = 11$ ) who had received it 7 times, 4.1% ( $n = 9$ ) who had received it 6 times, and 1.8% ( $n = 4$ ) who had received it 9 times. Thirty participants chose not to provide a response for their use of Medication/Drugs/Hormones.

Surgical Repair was the next treatment option. Two hundred forty-one participants chose to answer this question and 36.9% ( $n = 89$ ) responded that they had received this treatment. Of those who had used Surgical Repair, 64.7% ( $n = 55$ ) had used the treatment 1 time, 21.2% ( $n = 18$ ) had used the treatment 2 times, 5.9% ( $n = 5$ ) had used the treatment 3 times, and an equal percentage of participants (2.4%,  $n = 2$ ) had used the treatment 4, 5, and 6 times. The remaining participants (1.2%,  $n = 1$ ), used the treatment 10 or more times. Forty-one participants chose not to provide a response for use of Surgical Repair.

Artificial Insemination was another treatment option choice. Two hundred eighty two participants chose to answer this question and 47.7% ( $n = 116$ ) responded that they had used this treatment. Of those who had used Artificial Insemination, 25.9% ( $n = 29$ ), had used this treatment 2 times, 21.4% ( $n = 24$ ) had used this treatment 1 time, 19.6% ( $n = 22$ ) had used this treatment 3 times, 14.3% ( $n = 16$ ) had used this treatment 4 times, 7.1% ( $n = 8$ ) had used this treatment 5 times, 6.3% ( $n = 7$ ) had used this treatment 6 times, 2.7% ( $n = 3$ ) had used this treatment 7 times, 1.8% ( $n = 2$ ) had used this treatment 10 or more times, and 0.9% ( $n = 1$ ) had used this treatment 8 times. Thirty-nine participants chose not to provide a response for use of Artificial Insemination.

Two hundred thirty-one participants provided a response for their use of Sperm/Egg Donation and 5.2% ( $n = 12$ ) had used this treatment. Of this group, 50% ( $n = 6$ ) used this treatment 1 time. An equal percentage of participants (8.3%,  $n = 1$ ) had each used the treatment 3, 4, 5, 6, 7, and 10 or more times. Fifty-one participants chose not to provide a response for their use of Sperm/Egg Donation.

In Vitro Fertilization was the final treatment option choice. Two hundred forty-five participants chose to answer this question and 38.4% ( $n = 94$ ) had used this treatment. Of those that had used In Vitro Fertilization, 50% ( $n = 45$ ) had used the treatment 1 time, 25.6% ( $n = 23$ ) had used the treatment 2 times, 10% ( $n = 9$ ) had used the treatment 3 times, and 5.6% ( $n = 5$ ) had used the treatment 4 times. An equal percentage of participants had used the treatment 5 and 6 times (3.3%,  $n = 3$ ) and 7 and 9 times (1.1%,  $n = 1$ ). Thirty-seven participants chose not to provide a response for their use of In Vitro Fertilization.

### **Stage of Treatment**

The stage of infertility treatment refers to the number of treatments a women or couple has used in an attempt to conceive. In this study, the stage of treatment was determined by the

number of treatments a woman had used thus far. The number of treatments was summed to create a total number of treatments used by each participant. The women in this study had participated in between 1 and 41 different treatments ( $M = 10.90$ ,  $SD = 7.28$ ) with a median of 9.00 treatments. Hence participants were divided into three groups according to their number of treatments. Group 1 was composed of women who had experienced between 1 to 6 treatments, group 2 with women who had experienced between 7 to 12 treatments (group = 2), and group 3 consisted of women who had experienced 13 or more treatments. Group 1 accounted for 38.8% ( $n = 95$ ) of number of treatment responses. Group 2 accounted for 31.0% ( $n = 74$ ) of number of treatment responses. Group 3 accounted for 30.2% ( $n = 74$ ). Thirty-seven participants chose not provide a response for number of treatments.

### **Measurement Properties of the Study Instruments**

This study on women undergoing fertility treatments asked the study participants to complete four different measures (*CISS*, *IMS*, *MHI-5*, and *CSIC*) and set of demographic questions. The measurement properties and scoring used for each instrument are presented below.

#### ***Coping Inventory for Stressful Situations***

The *Coping Inventory for Stressful Situations* (*CISS*) (Endler & Parker, 1999) consists of 48 items using a 5 point Likert type response scale of *Not at All* (1) to *Very Much* (5). The *CISS* has 3 subscales, *Avoidance*, *Task*, and *Emotion*, each consisting of 16 items. A factor analysis of the *CISS* items was conducted to ensure the items and subscales were viable for this group of individuals. Each of the items fell into the subscales proposed by Endler and Parker. Reliability was also computed for each of the subscales using a Cronbach alpha and was comparable to reported reliability coefficients (Tirre, 2004). Table 4-7 presents the measurement properties of the *CISS* Scores for the *Task*, *Avoidance*, and *Emotion* subscales, which were calculated by

summing across the 16 items in each subscale and then using the subscale score in all further analyses. As shown in table 4-3, the *Avoidance*, *Emotion*, and *Task* subscales had acceptable reliability for this group of women. Cronbach alpha reliability coefficients ranged from .758 to .903.

### ***Mental Health Inventory-5***

The *Mental Health Inventory-5* (*MHI-5*) consists of 5 items measuring the self perceptions and level of stress and strain experienced by an individual (Gladding, 2001). The *MHI-5* is a subscale of the SF-36 (Ware & Sherbourne, 1992). *MHI-5* items were answered using a 5-point Likert type response scale of *All of the Time* (1), *Most of the Time* (2), *Some of the Time* (3), *A Little of the Time* (4), and *None of the Time* (5). Two items (1 and 2) on the *MHI-5* were reversed scored to *All of the Time* (5), *Most of the Time* (4), *Some of the Time* (3), *A Little of the Time* (2), and *None of the Time* (1). Scoring for the *MHI-5* uses a specific transformation formula converting the lowest and highest possible scores to 0 and 100, respectively, as follows: actual raw score - lowest score possible divided by the possible raw scored range times 100. For example, the lowest possible score is 5 and the highest possible score is 25 with a possible raw score range of 20. This transformation procedure puts the *MHI-5* on a 0 to 100 measurement scale. Table 4-4 presents the descriptive characteristics of the *MHI-5* for this group of females. As can be seen in Table 4-8, the reliability Cronbach alpha coefficients are similar to prior reports of reliability and are fairly high, indicating a high level of internal consistency and reliability. Factor analysis confirmed that the *MHI-5* assessed one construct.

### ***Index of Marital Satisfaction***

The *Index of Marital Satisfaction* (*IMS*) (Hudson, 1993) consists of a unitary scale of 25 items. There are no viable subscales contained in the *IMS*. The *IMS* measures an individual's

contentment or satisfaction in a marital relationship. The *IMS* uses a 7-point Likert-type response scale of *None of the Time* (1) *Very Rarely* (2), *A Little of the Time* (3), *Some of the Time* (4), *A Good Part of the Time* (5), *Most of the Time* (6), and *All of the Time* (7). *IMS* scores can range from 0 to 100 with lower scores indicating a higher level of satisfaction with the relationship due to the way the items are scored. There are 13 reverse coded items in the *IMS* (items 1, 3, 5, 8, 9, 11, 13, 16, 17, 18, 20, 21, and 23) coded as *None of the Time* (7) *Very Rarely* (6), *A Little of the Time* (5), *Some of the Time* (4), *A Good Part of the Time* (3), *Most of the Time* (2), and *All of the Time* (1). Table 4-9 presents the measurement properties of the *IMS*. Scoring of the *IMS* is accomplished by first reverse scoring the 13 items and summing the items (reversed and not reversed). This sum is subtracted from the number of completed items, multiplying this figure by 100 and dividing the number of items completed times 6. This produces a range of 0 to 100 with higher scores indicating a greater magnitude or severity of problems. As can be seen in the Table, the calculated Cronbach alpha for this group of females was high and comparable to previously reported administrations of the *IMS* scale.

### ***Coping Scale for Infertile Couples***

The *CSIC* is a 15-item scale identifying particular coping strategies used to manage the stress of infertility. In the original version of this measure coping strategies were divided into 4 subscales (*Increasing Space*, *Regaining Control*, *Being the Best*, and *Sharing the Burden*). This measure was originally developed in Taiwan and the initial evaluation included both men and women, all of whom were from Taiwan. The present study's participants were primarily from the United States and were solely female. The scales did not appear to be viable as they did not factor like the Lee et al. scales and the Cronbach alpha reliability coefficients were very low as presented in Table 3-2. Therefore, the researcher adapted the measure to the current population of interest and three viable subscales were created. Factor analysis was used to identify three

subscales. The items on each subscale were summed to create a score and test reliability. The three subscales used in the adapted version of the *CSIC* for the purpose of this study were: *Space*, *Control*, and *Beliefs*. Further explanation of the process used to adapt this measure was described in Chapter 3. In this adapted version, the *CSIC* maintained the use of a 5-point Likert-type response scale ranging from *Never* (1) to *Almost Always* (5). Table 4-10 presents the measurement properties of the *CSIC*.

The *Space* subscale refers to how infertile women acted and reacted in various situations. The *Control* subscale describes how infertile females control their lives and themselves. The *Beliefs* subscale was defined as what infertile women believed would help them manage their infertility. Each subscale consisted of 5 items. The developers of the original *CSIC* reported moderate reliability ( $\alpha = .78$  to  $.72$ ) and validity according to preliminary results. Test-retest was  $r = .73$ , assessed over a 2-week interval, supporting reliability stability. Moderate reliability was shown in all four subscales as well as the total scale using a coefficient alpha suggesting that the set of items in each of the four subscales was relatively homogenous (Lee et al., 2000). The Cronbach alphas using the original subscales were: *Increasing Space*,  $\alpha = .664$ ; *Regaining Control*,  $\alpha = .475$ ; *Being the Best*,  $\alpha = .310$ ; and *Sharing the Burden*,  $\alpha = .290$ . An analysis of the adapted version of the *CSIC* used in this study found the Cronbach alpha improved for the three subscales. Cronbach alpha reliability coefficients ranged from  $.664$  to  $.610$ . While this is not high, reliability is relative and the alphas are acceptable for an instrument of this type.

The four instruments used in the study were analyzed and their measurement properties examined. It was deemed advisable to re-factor analyze the *CSIC* scale to identify useful and meaningful subscales with acceptable internal consistency and reliability. The four scales and

subsequent subscales demonstrated acceptable to high internal consistency for this group of infertile females.

## **Research Questions and Hypotheses Analysis**

### **Research Question 1**

The first research question for the study was: Are there differences by age and stage of treatment in the styles of coping (*Task* oriented, *Emotion* oriented, and *Avoidance* oriented), levels of marital satisfaction, infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), and individual well-being of women engaged in infertility treatment? This was formulated into the following null hypothesis: There are no significant differences by age and stage of treatment in the three styles of coping (*Task* oriented, *Emotion* oriented, or *Avoidance* oriented), the levels of marital satisfaction, infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), or individual well-being reported by women engaged in infertility treatment.

Research Question 1 was addressed through the use of a multivariate ANOVA statistic, MANOVA. MANOVA tests the combined dependent variable to assess whether there is a difference in the combined multivariate variable. This was followed by the use of a series of ANOVAs to determine whether there were significant differences by age/stage for each of the dependent variables. A probability level of  $p = .05$  or less was used as the criteria for accepting or rejecting the null hypothesis based on the results from the MANOVA and the univariate ANOVAs conducted as a part of the MANOVA.

The independent variables were age group and number of treatments group and the dependent variables were the subscale scores of the *CISS* (*Task*, *Avoidance*, and *Emotion*), the *MHI-5* score, the *IMS* score, and the subscale scores of the *CSIC* (*Space*, *Control*, and *Beliefs*). The independent variables of number of treatments and age were grouped as categorical variables. Participant responses of Age ranged from 19 to 48 years of age and were grouped as

19-29 ( $n = 76$ , 29.7%), 30-33 ( $n = 100$ , 39.1), and 34 or more years of age ( $n = 80$ , 31.3%).

Number of treatments ranged from 1 to 41 and were grouped as 1-6 treatments ( $n = 92$ , 38.8%), 7-12 treatments ( $n = 74$ , 30.2%), and 13 or more treatments ( $n = 76$ , 31.0%). The assumptions of MANOVA were assessed, the Box's test for equality of the covariance matrices was found to be acceptable ( $p = .394$ ), and bivariate correlations among the dependent variables ranged from  $r = .119$  to  $r = .333$ .

### **Factorial MANOVA analysis**

The factorial MANOVA analysis using two independent variables of age group and treatment group indicated there was no statistically significant interaction between age group and number of treatments for the combined multivariate dependent variable [Wilks  $\Lambda = .839$ ,  $F(332, 908) = 1.261$ ,  $p = .153$ ]. Further inspection found there was no statistically significant main effect results for the multivariate combined dependent variable for number of treatment groups [Wilks  $\Lambda = .931$ ,  $F(16, 448) = 1.261$ ,  $p = .431$ ] and for the multivariate combined variable for age group [Wilks  $\Lambda = .898$ ,  $F(16, 448) = 1.541$ ,  $p = .080$ ]. The null hypothesis was not rejected for an interaction between age group and treatment group and for the multivariate combined variable main effects for age group and treatment group.

### **Factorial ANOVA analysis**

As shown in Table 4-11, the results of a series of factorial ANOVAs testing for an interaction between age group and treatment group for each individual dependent variable. The factorial ANOVA also tested for age group and treatment group main effects and was reported if the interaction was not statistically significant. There was a statistically significant interaction between age group and number of treatments for the *CISS Emotion* subscale,  $F(4, 231) = 2.733$ ,  $p = .030$ . There was also a statistically significant interaction for the *Space* subscale of the *CSIC*

scale,  $F(4, 231) = 4.389, p = .002$ . The null hypothesis was rejected for *Emotion* and *Space* as there was a significant interaction between age group and treatment group. Post hoc pairwise programmed tests found there were significant differences for the *Emotion* ( $p = .050$ ) and *Space* ( $p = .002$ ) subscales for number of treatment group 3 (13+) and age group 2 (30-33) and the number of treatments group 3 (13+) and age group 3 (34+). All other pairwise comparisons were non-significant ( $p = >.05$ ). There were no statistically significant main effects for age group or treatment group. Table 4-11 presents the results of the series of factorial analyses for all of the dependent variables and Tables 4-12 and 4-13 presents the means and standard deviations by age group and treatment group. Table 4-14 presents the means and standard deviations for age and treatment group combined. Table 4-15 presents the significant estimated marginal means for *Space* and *Emotion* for the significant pairwise comparisons.

## **Research Question 2**

The second research question for the study was: What influences do the three styles of coping (*Task* oriented, *Emotion* oriented, or *Avoidance* oriented), the level of marital satisfaction, the three infertility-specific coping strategies (*Space*, *Control*, and *Beliefs*), the number of fertility treatments, or the woman's age have in predicting the level of individual well-being of women engaged in infertility treatment?

This was formulated as the following null hypothesis: There is no significant contribution made by each style of coping (*Task*, *Emotion*, and *Avoidance*), the level of marital satisfaction, the infertility-specific coping strategies used (*Space*, *Control*, and *Beliefs*), the number of fertility treatments, or the woman's age to predict the level of individual well-being of women engaged in infertility treatment.

Research Question 2 asked if participants' scores on the three coping subscales (*Task*, *Avoidance*, and *Emotion*), their *IMS score*, their scores on the subscales of the *CSIC* (*Space*,

*Control*, and *Beliefs*), the number of fertility treatments, or the woman's age served as statistically significant predictors of *MHI-5* scores. A stepwise multiple regression analysis was used to address this question. Stepwise regression seeks to find the best combination of variables to predict the dependent variable. The assumptions of regression were assessed and found to be acceptable. Collinearity was not a problem among the variables as the VIF and Tolerance were well within acceptable ranges. Table 4-16 presents the correlation matrix of regression predictor variables.

Results of the regression analyses resulted in a five step model for predicting scores on the *MHI-5*. The final regression results indicated the overall model predicted individual well-being,  $R = .618$ ,  $R^2 = .382$ ,  $R^2_{adj} = .368$ ,  $F(1, 234) = 4.679$ ,  $p = .032$ , and accounted for 38.2% of the variance in individual well-being. The statistically significant predictors were the *Emotion* coping subscale, the *Avoidance* coping subscale, the *IMS* score, the *Space* subscale score of the *CSIC*, and the *Task* subscale of the *CISS* (see table 4-10). Hence, the null hypothesis was rejected. Age and number of treatments were not statistically significant predictors to the model nor were *Control* and *Beliefs* of the *CSIC* scale. Since these were not statistically significant in the stepwise model, they are not reported in the tables. A summary of the five model steps is presented in Table 4-17. Table 4-18 presents the significant model coefficients.

### **Summary**

In this chapter, the results of a survey of married females currently receiving treatment for infertility were presented. A description of the study participants was given along with an analysis of the instruments used. Descriptive statistics for the study's research variables and correlations between variables were presented. The study's research questions were answered by providing a detailed explanation of the results of the data analysis. In Chapter 5, the results will

be discussed as well as the study limitations and implications for theory, counseling practice and policy. In addition, recommendations for future research will be presented.

Table 4-1. Descriptive Data for Study Participants

	No	Minimum	Maximum	<i>Mean</i>	<i>SD</i>
Age	256	19	48	31.94	4.791
Income	236	5,000.00	1,000,000.00	109,953.39	99,577.88

Table 4-2. Frequency of Participants By Age

Age	N	Percentage
19	1	.4
20	1	.4
23	1	.4
24	7	2.7
25	11	4.3
26	11	4.3
27	3	10.2
28	21	8.2
29	20	7.8
30	30	11.7
31	30	11.7
32	24	9.4
33	16	6.3
34	12	4.7
35	14	5.5
36	4	1.6
37	20	7.8
38	4	1.6
39	69	2.3
40	5	2.0
41	4	1.6
42	3	1.2
43	5	2.0
45	2	.8
48	1	.4

Table 4-3. Frequency of Participants By Reported Income

Income	N	Percentage
5,000	1	.4
15,000	1	.4
22,000	1	.4
25,000	1	.4
27,000	3	1.3
30,000	1	.4
35,000	4	1.7
40,000	2	.8
41,000	5	2.1
42,000	1	.4
44,000	1	.4
45,000	1	.4
50,000	4	3.0
51,000	7	.4
55,000	5	2.1
56,000	1	.4
60,000	12	5.1
61,000	1	.4
65,000	5	2.1
66,000	1	.4
69,000	1	.4
70,000	13	5.5
73,000	2	.8
75,000	15	6.4
78,000	1	.4
80,000	12	5.1
85,000	6	2.5
90,000	12	5.1
91,000	1	.4
95,000	3	1.3
99,999	1	.4
100,000	26	11.0
105,000	1	.4
110,000	6	2.5
120,000	13	5.5
124,000	1	.4
125,000	4	1.7
130,000	4	1.7
140,000	6	2.5
142,000	1	.4
145,000	2	.8
147,000	1	.4
150,000	14	5.9

Table 4-3. Continued

Income	N	Percentage
160,000	2	.8
165,000	1	.4
170,000	2	.8
175,000	2	.8
180,000	3	1.3
190,000	1	.4
195,000	1	.4
200,000	6	2.5
220,000	1	.4
225,000	1	.4
230,000	1	.4
250,000	4	1.7
285,000	1	.4
300,000	2	.8
380,000	1	.4
1,000,000	2	.8

Table 4-4. Frequency of Participants' Educational Level

Level of Completed Education	N	Percentage
Elementary Middle	10	0.0
High School	47	5.3
Some College (did not graduate)	28	10.7
Associate Degree (2 year)	24	9.2
Bachelor (4 year)	94	35.9
Masters Degree	69	26.3
Specialists Degree	9	3.4
Doctoral Degree (Ph.D., Ed.D.+)	10	3.8
Professional Degree (J.D., M.D.)	14	5.3

Table 4-5. Frequency of Participants By Ethnic Group

Ethnic Group	N	Percentage
Caucasian	231	89.2
Hispanic	6	2.3
Caribbean	1	.4
African American	3	1.2
Asian/Pacific Islander	6	2.3
Mixed Cultural/Ethnic	8	3.1
Other	4	1.5

Table 4-6. Descriptive Data for Infertility Treatments

	<i>N</i>	Minimum	Maximum	<i>Mean</i>	<i>SD</i>
Education	133	1	10	4.41	3.480
Medical	218	1	10	5.37	3.348
Surgery	85	1	10	1.72	1.444
Artificial	112	1	10	3.06	1.914
Egg Donor	12	1	10	3.42	3.029
InVitro	90	1	9	2.08	1.582

Table 4-7. Properties of the *Coping Inventory for Stressful Situations*

	<i>N</i>	No of Items	<i>Mean</i>	<i>SD</i>	Range	Study Alpha	Prior Alpha
<i>Task</i>	282	16	54.08	11.82	5-80	.903	.90
<i>Avoidance</i>	282	16	45.09	10.07	10-80	.758	.82
<i>Emotion</i>	281	16	46.32	11.56	1-80	.875	.86

Table 4-8. Properties of the *Mental Health Inventory-5*

	<i>N</i>	No of Items	<i>Mean</i>	<i>SD</i>	Range	Study Alpha	Prior Alpha
<i>MHI-5</i>	278	5	32.84	15.825	0-70	.872	.88

Table 4-9. Properties of the *Index of Marital Satisfaction*

	<i>N</i>	No of Items	<i>Mean</i>	<i>SD</i>	Range	Study Alpha	Prior Alpha
<i>IMS</i>	268	25	17.07	14.46	0-100	.952	.96

Table 4-10. Properties of the *Coping Scale for Infertile Couples*

	<i>N</i>	No of Items	<i>Mean</i>	<i>SD</i>	Range	Study Alpha
<i>Space</i>	264	5	13.65	4.38	5-25	.664
<i>Control</i>	264	5	15.56	3.29	5-25	.627
<i>Beliefs</i>	264	5	19.29	3.39	5-25	.610

Table 4-11. Factorial Analysis of Variance By Age Group and Number of Treatments Group

	Age by Treatment	Age Group	Treatment Group
<i>IMS</i>	$F(2, 231) = .295, p = .861$	$F(2, 231) = 1.854, p = .159$	$F(2, 231) = 1.957, p = .144$
<i>Task</i>	$F(2, 231) = .568, p = .671$	$F(2, 231) = .546, p = .580$	$F(2, 231) = .164, p = .849$
<i>Emotion</i>	$F(2, 231) = 2.733, p = .030$	$F(2, 231) = .967, p = .382$	$F(2, 231) = .142, p = .868$
<i>Avoidance</i>	$F(2, 231) = .523, p = .719$	$F(2, 231) = 1.802, p = .167$	$F(2, 231) = .180, p = .835$
<i>MHI-5</i>	$F(2, 231) = .502, p = .734$	$F(2, 231) = 1.466, p = .233$	$F(2, 231) = .007, p = .993$
<i>Space</i>	$F(2, 231) = 4.389, p = .002$	$F(2, 231) = 2.524, p = .082$	$F(2, 231) = .790, p = .455$
<i>Control</i>	$F(2, 231) = .348, p = .845$	$F(2, 231) = .707, p = .494$	$F(2, 231) = 2.017, p = .135$
<i>Beliefs</i>	$F(2, 231) = .812, p = .812$	$F(2, 231) = .322, p = .725$	$F(2, 231) = .306, p = .737$

Table 4-12. Means and Standard Deviations for Age Group

	Age 19-29		Age 31-33		Age 34+	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>IMS</i>	15.75	13.10	15.06	12.56	20.32	17.35
<i>Task</i>	53.13	11.23	54.30	11.75	55.48	10.35
<i>Emotion</i>	46.35	11.97	47.64	10.57	45.22	11.92
<i>Avoidance</i>	47.20	8.66	44.56	8.92	44.71	10.42
<i>MHI-5</i>	34.16	15.89	34.30	15.52	29.91	15.98
<i>Space</i>	14.23	4.29	14.33	4.13	12.89	4.66
<i>Control</i>	15.84	3.33	15.25	3.22	15.63	3.26
<i>Beliefs</i>	19.60	3.10	19.20	3.22	19.56	2.96

Table 4-13. Means and Standard Deviations for Treatment Group

	1-5 Treatments		7-12 Treatments		13+ Treatments	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>IMS</i>	14.81	12.43	15.79	12.32	20.66	17.99
<i>Task</i>	54.73	10.93	53.47	12.19	54.63	10.47
<i>Emotion</i>	46.92	11.57	46.31	10.77	46.38	11.95
<i>Avoidance</i>	45.52	9.72	45.06	9.09	45.63	9.31
<i>MHI-5</i>	33.30	14.67	32.84	14.89	32.47	18.23
<i>Space</i>	13.55	4.24	14.00	4.22	13.98	4.73
<i>Control</i>	19.26	3.24	19.32	3.22	19.68	2.86
<i>Beliefs</i>	16.41	3.06	16.21	3.16	16.42	2.93

Table 4-14. Means and Standard Deviations By Age Group and Treatment Group

	Treatment 1-6		Treatment 7-12		Treatment 13+	
	M	SD	M	SD	M	SD
<b>EMOTION</b>						
Age 19-29	48.00	12.58	44.68	9.82	45.15	14.28
Age 30-33	44.94	8.94	46.98	10.90	<b>52.03</b>	10.85
Age 34+	48.16	13.32	46.56	12.30	42.52	10.35
<b>SPACE</b>						
Age 19-29	12.88	4.58	15.00	3.91	15.76	
Age 30-33	13.67	3.98	13.57	4.09	<b>16.15</b>	3.98
Age 34+	14.37	4.12	13.31	4.48	11.64	4.70

Table 4-15. Estimated Marginal Means for Pairwise Comparisons

	Emotion		Space
	Mean	Mean	Mean
Number treatment 1, Age group 1	48.00		12.88
Number treatment 1, Age group 2	44.94		13.67
Number treatment 1, Age group 3	48.16		14.37
Number treatment 2, Age group 1	44.68		15.00
Number treatment 2, Age group 2	46.97		13.57
Number treatment 2, Age group 3	46.56		13.13
Number treatment 3, Age group 1	45.15		15.76
Number treatment 3, Age group 2*	52.03		16.15
Number treatment 3, Age group 3*	42.52		11.64

\* Number treatment 3, Age group 2 differed from Number of treatment 3, Age group 3,  
*Emotion*,  $p = .050$ , *Space*,  $p = .002$

Table 4-16. Correlation Matrix of Regression Predictor Variable

	IMS	Task	Emotion	Avoidance	Space	Control	Beliefs	Age	Treat
<i>IMS</i>	1.00								
<i>Task</i>	-.051	1.00							
<i>Emotion</i>	.277	-.121	1.00						
<i>Avoidance</i>	-.159	.311	.164	1.00					
<i>Space</i>	.049	-.121	.248	-.222	1.00				
<i>Control</i>	-.312	.276	.304	.157	-.065	1.00			
<i>Beliefs</i>	-.258	.192	-.074	.139	-.046	.222	1.00		
<i>Age</i>	.146	.107	-.121	-.124	-.117	.016	-.048	1.00	
<i>Treat</i>	.213	-.014	.022	.071	.071	-.090	.084	.264	1.00

Table 4-17. Model Summary for *Mental Health Inventory-5*

Step	R	$R^2$	$R^2_{adj}$	F	Df	p
1a	.530	.281	.278	93.136	1,238	<.001
2b	.575	.331	.325	17.548	1,237	<.001
3c	.597	.356	.348	9.186	1,236	.003
4d	.608	.369	.359	5.000	1,235	.026
5e	.618	.382	.368	4.679	1,234	.032

a = *Emotion*b = *Emotion, Avoidance*c = *Emotion, Avoidance, IMS*d = *Emotion, Avoidance, IMS, Space*e = *Emotion, Avoidance, IMS, Space, Task*Table 4-18. Model Coefficients for *Mental Health Inventory-5*

	B	$\beta$	T	P	Bivariate r	Partial r
<i>Emotion</i>	.616	.444	7.603	<.001	.530	.445
<i>Avoidance</i>	-.224	-.133	-2.363	.019	-.154	-.153
<i>IMS</i>	.194	.178	3.270	.001	.327	.209
<i>Space</i>	.459	.127	2.301	.022	.299	.149
<i>Task</i>	-.166	-.117	2.163	.032	-.140	-.140

## CHAPTER 5 DISCUSSION

The experience of infertility is generally an unexpected crisis for a woman that can test the strength of her marital relationship and her emotional stability (Eunpu, 1995). Infertility has the potential to strengthen the relationship between a woman and her partner or create significant distress in the marriage (Watkins & Baldo, 2004). Aside from the physical implications, infertility also has the potential to impact the female to a point where she may be at a greater risk for psychological distress, and experience a decrease in self esteem and body image, and a general decline in her emotional well-being (Imeson & McMurray, 1996). Many researchers have evaluated the impact of infertility on the physical and emotional health of women. Several researchers have also examined the ways in which men and women cope with infertility. Limited research has been available that evaluated possible predictors of individual well-being for females in the process of infertility treatment. This study examined the following possible predictors of female individual well-being: (a) general coping style, (b) level of marital satisfaction (c) infertility-specific coping strategies, (d) age, and (e) stage of treatment. Additionally, the study sought to examine whether there was a main effect or interaction between age group and number of treatments group on the scales and subscales used in the study. Presented in this chapter are the study limitations, discussion of the results, implications, and recommendations for future research that evolved from the research.

### **Evaluation of Research Questions**

This study of married females currently receiving treatment for infertility included 282 women ranging in age from 19 to 48 with an average age of 31.94. The range of ages of the participants was interesting as they were relatively young to middle aged. The concentration of women in the 30-33 age group appears to be indicative of women realizing their biological

clocks are running and if they want to have children they need to ensure they get pregnant and may be using infertility treatments to help them reach their goal. The females were predominantly Caucasian (89.2%), and were well educated, holding a Bachelors (84%) degree or higher. These women were for the most part well educated and the assumption could be made they have had careers and are now attempting to have children before it is too late. They may have also put off having children due to educational and career aspirations and now need the assistance of infertility doctors as they age and get older and possibly beyond their reproductive years.

Each participant completed a survey comprised of instruments measuring (a) coping styles (*CISS*), (b) level of marital satisfaction (*IMS*), (c) individual well-being (*MHI-5*), (d) infertility-specific coping skills (*CSIC*), and (e) a demographic questionnaire. It was interesting to note that the women participating in the study reported between 1 and 41 incidences of different types of infertility treatments. Sixty-eight women had undergone 1-2 invasive and expensive in vitro treatments in their efforts to have a child while 22 women had undergone in vitro treatments between 3 and 9 times. The women in the study had tried many different methods of getting pregnant many different times.

Scores were computed for each participant's responses to the study's scales or subscales, allowing investigation of the relationship among these variables. Regression analysis was used to test the predictive power of these variables in predicting women's well-being. Factorial MANOVA and a factorial ANOVA were used to test for differences among the women by age and stage of treatment. A probability level of  $p = .05$  or less was used as the criteria for accepting or rejecting the null hypotheses. Regression was used to test the predictive hypothesis.

A probability level of  $p = .05$  or less was used as the criteria for accepting or rejecting the regression null hypotheses.

The first hypotheses examined significant differences by age group and number of treatments group for the participants' combined multivariate and individual scores on the *CISS* (*Emotion, Avoidance, and Task*), the *IMS*, the *CISC* (*Space, Beliefs, and Control*), and the score on the *MHI-5*. A MANOVA was used as the statistic to test for differences by age group and number of treatments group on the combined multivariate variable. MANOVA allows the testing of the overlap of multiple dependent variables and may be useful when comparing treatments or groups based on different characteristics, in the case of this study, age group and number of treatments. MANOVA is effective when a treatment or characteristic may affect participants in more than one way and allows the researcher to obtain a more holistic view and more detailed description of the variables in the investigation. The idea of a MANOVA stems from the fact that it is difficult to obtain a measure of any trait such as self-esteem, achievement, etc. from any one variable. Thus, multiple measures of variables representing a common characteristic are likely to be more representative of the common characteristic or variable. In a multivariate situation, the dependent variables are treated as a combination, testing whether the mean differences among the groups on a combination of dependent variables are significant. A part of the MANOVA testing is the creation of a new dependent variable and this new variable is the linear combination of the original measured variables (Mertler & Vannatta, 2001).

The MANOVA findings for the study indicated there was no significant interaction or main effect for age group or treatment group. The factorial ANOVA follow up analysis indicated there were no significant differences on the individual variables for age group or

number of treatments; however, there was a significant interaction between age group by treatment group for *Emotion* and *Space*.

The ages for the women participating in the study ranged from 19 to 48 with the largest group of women being between 30 and 33. The number of treatments was shown to increase as the women got older. As noted in Table 4-9, as the females aged and had more treatment, their scores on the *Emotion* subscale increased from 44.94 to 52.03, the highest mean score on this subscale for any group. The *Emotion* subscale purports to measure emotional reactions to reduce stress such as self-blaming, self-preoccupation, and fantasizing, some of whom may not be effective in reducing stress (Tirre, 2004). Higher scores on the *Emotion* subscale are indicative of a higher level of using these types of self-blaming behaviors more than others. Oftentimes, emotional expression is seen as a positive coping mechanism for women going through treatment that may actually be associated with higher treatment success (Schmidt, 2006). Feelings of self-blame, failure, and decline in self-esteem associated with the behaviors depicted in the *Emotion* coping subscale are common reactions to the process of infertility and can be related to a combination of the emotional stress felt during the process of treatment as well as physical and hormonal reactions to the treatments themselves (Watkins & Baldo, 2004). The concern in this case is the potential effect these behaviors can have on the success of treatment as very often, stress and emotional strain experienced during infertility can take such a toll on the woman's body that it could negatively impact the chance of conception (Eunpu, 1995).

It is important to clarify that although high scores on the emotions subscale may be seen as negative, they are indicative of better individual well-being. This is likely due to a variety of factors. The *Emotion* subscale measured responses to stress that included becoming overly emotional, getting angry, getting upset, or getting tense. In many cases, these might seem like

unhealthy responses to a given situation, however, they can also be viewed as cathartic responses that allow the individual to release emotion that may have been building within them. Responses that are considered appropriate and healthy in one circumstance may be unhealthy in another, and vice versa.

The older the woman and the higher the number of treatments, the higher the woman scores in the *Emotion* subscale, especially among age group 2 (30-33). It is important to note that while this is the case, the 34+ age group showed substantially less use of emotion coping behaviors, as compared to the higher scores in the 30-33 age group. According to Watkins and Baldo (2004), younger women tend to experience higher levels of stress as compared to older women. This drop in scores after age 34 may be due to greater experience and time spent in the treatment process combined with a greater sense of acceptance over circumstances beyond one's control that often comes with age or other sources of self identity.

There was also a significant difference by age in the women's responses on the *Space* strategy subscale of the *CSIC*. Participants who have high scores on the *Space* subscale tend to create a greater degree of space between themselves and their infertility problem. This involves distancing themselves from children and not discussing the infertility problem with friends and family members. This subscale is consistent with the literature on female reaction to infertility as often times, women will deny their desire for children to friends and family members in order to avoid perceived awkward conversations and to hide the experience (Cudmore, 2005). The data indicates that women in the 30-33 age group reported using this set of strategies more often than the other two age groups, with women in the 19-29 age group close behind. Older women (34+) with a greater amount of treatments used *Space* significantly less often, perhaps showing a greater grasp of more effective coping and relying more often on interactions with others and

surrounding themselves with social support. In addition, women in the 13+ treatment group use space most often as a way of coping with their infertility problem.

The second hypothesis assessed the power of the participants' responses to the 3 styles of coping, level of marital satisfaction, 3 infertility-specific coping strategies, age, and number of fertility treatments to predict their individual well-being score. Using a stepwise multiple regression, it was determined that *Emotion* coping, *Avoidance* coping, *IMS*, *Task*, and *Space*, scores were significant predictors of individual well-being. *Task* and *Avoidance* were negatively related to well-being and *Emotion*, *Space*, and *IMS* were positively related to mental well-being. The five variables accounted for 38.2% of the variance in *MHI-5* scores for individual well-being. However, the *Emotion* subscale accounted for the largest percentage of the variance or 28.1%. The data suggest there are other variables not measured in this study that may also account for the mental health status of women participating in infertility treatments. Scores lower than 52-56 on the *MHI-5* (Ware & Sherbourne, 1992) are considered to be indicative of poor mental health reflecting for this group of women how infertility may be affecting their mental health. Considering the variability found in the *Emotion* subscale of the *CISS* it is not too surprising *Emotion* score was the predictor variable accounting for most of the variance in this regression analysis. *Avoidance* and *Task* from the *CISS* were negatively related to *MHI-5* scores indicating as one score went up the other went down. Marital satisfaction and *Space* both contributed positively to the regression formula and are indicative of how women being treated for infertility deal with their infertility and the impact this has on their overall mental health. The women participating in the study were more inclined to use *Emotion* based skills in predicting their overall mental health. Their marital satisfaction and *Space* strategies served to impact

mental health positively while *Avoidance* and *Task* were more negative in predicting overall well-being.

It was somewhat surprising that age and treatment stage were not significant predictors of well-being and that coping styles and strategies served as much better predictors. It is also interesting that emotion-based coping would be considered a positive predictor of well-being and task-focused coping considered a negative predictor. The literature on coping skills generally speculates the opposite effect with each style of coping. Perhaps the experience of infertility is unique as coping styles and strategies used in other situations would bring about different results. The tenets of Stress and Coping Theory are most consistent with this finding as it posits that coping processes are not inherently positive or negative. What is positive in one circumstance may be negative in another (Jordan & Revenson, 1999). What is also interesting to speculate is what other factors may be impacting or predicting the mental well-being of infertile women that were not included in this study.

### **Limitations of the Study**

Although an effort was made to design a study that was generalizable to the population of interest, some limitations exist in the current study design. The first limitation of the study sample used is in the convenience snowball sampling method used to gather participants. This method may not have produced as fully accurate a representation of this population as might have a probability sample. There may have also been specific characteristics of the sample itself that may have affected the results and created biased estimates, based on the fact that they volunteered to participate. Volunteers tend to be intrinsically different from non-volunteers. They tend to be more highly educated, seek social approval, have a higher social status, be more unconventional, and be less authoritarian and less conforming (Gall et al., 2006). There are

however, limited resources to locate women in fertility treatment as the subject has a social stigma that deters women from openly discussing their struggle in open forums.

Another limitation of the study is its design. The cross-sectional design used investigated the impact of the variables at only one point in time, rather than longitudinally. If the variables are perceived as ever changing, it would be necessary to conduct a longitudinal study to gain a more accurate picture of the construct over a period of time. The study is also correlational in nature and therefore the relationships identified between the variables cannot imply causation. Moreover, the relationships among these variables may potentially be influenced by variables not investigated in this study. For example, participants whose scores on the *MHI-5* indicated poor individual well-being may have a long history of depression unrelated to infertility. Another design-related limitation is in the self-report format required in the study. Though the survey was available in both paper-based and Internet-based form, all participants chose to use the Internet-based option. Therefore, it is impossible to know for certain that the person who responded truly met the requirements for participation and that their responses were completely accurate. For example, it was difficult to verify whether participants recruited from online resources had received a formal diagnosis of infertility from a physician rather than a self-prescribed diagnosis as study is completely dependent upon their self-report. The responses may be susceptible to social desirability bias. It is a human trait to want to make ourselves look better than we really are or to present ourselves in a socially desirable way (Gall et al.).

A further limitation may exist in the instrumentation used in the study, particularly that of the *CSIC*. This measure was developed in Taiwan and originally tested on couples, rather than only women. Because of its international origination, the measure was most likely written in Mandarin. There may have been some problems with the translation between Mandarin and

English, possibly causing miscommunications for English-speaking participants. The original testing on couples rather than women may also have presented issues when using it with the present study's solely female population. The factor analysis of the responses of the participants from this study revealed a different factor structure from that originally proposed by the test developers.

Non-response may have been seen as a limitation in this study. There are two main reasons for this issue. The main areas of participant non-response were noted in the demographic questionnaire. Several questions asked participants to provide information such as location, age, and income. In these cases of non-response, it is likely that participants either felt uncomfortable providing this information or did not want to answer potentially identifying information, given that the survey was anonymous. Other questions asked participants about the types of treatments they have used thus far. In these cases of non-response, participants either had not received that particular treatment or were uncomfortable confirming their use of certain treatments. Although the issue of infertility has become much more widely discussed, it is still an issue surrounded by significant secrecy. For example, in a case where a participant has used sperm or egg donation, it might be likely for her to want to keep that information private.

A final limitation was that the study would not reflect the general demographics of infertile women in the United States. Participant responses may have been skewed in only representing individuals of a higher socioeconomic status due to the high cost of infertility treatment and the limited insurance coverage for these procedures. Women in a lower socioeconomic status may experience many of the same emotions and frustrations as those who can afford treatments, but may not be able to engage in such extensive treatments. This study focused solely on infertile women currently receiving treatment. It is important to note that

women receiving infertility treatment are typically of a higher socioeconomic status, due to the high cost of treatment. Therefore, this study may not be representative of infertile women in general, but is likely representative of infertile women receiving treatment in the area of socioeconomic status.

### **Implications**

The findings of the present study yield implications for theorists studying the psychological impact of infertility, for professionals who work with infertile women or couples, and for researchers who study the impact of infertility. An issue that arose during the data analysis phase of this research was the number of infertility treatments the participants had used thus far. Several women in the study had used over 30 different infertility treatments in an attempt to conceive. In fact, 1 participant had used over 40 treatments. Little, if any, research exists on the number of treatments and the duration of time that women and couples are willing to persist through in order to have a baby. Future studies may investigate the relationship between amount of treatments used and the effect they can have on physical and emotional health. Another study might examine the relationship between number of treatments and motivation for parenthood or importance of having a biologically-related child.

In this study, the researcher invited only married, heterosexual females to participate. Future studies might investigate the same variables in homosexual women in committed relationships or unmarried women in committed relationships. In reviewing the data and in gaining feedback from study participants, it was found that marriage was not a necessary step to take before attempting conception through fertility treatment. Another area to examine might be single women hoping to become single mothers through fertility treatment. As trends in our society change, it has become more socially acceptable for a woman to have a non marital child.

A final area for future research is based upon the data collected on age as related to treatment. It seems that women between 30 and 33 had received a significantly higher number of treatments than those in the 19-29 year old age group. Though age is a major factor and likely cause of infertility, it would also be interesting to investigate the social views of motherhood as related to a particular age cohort. Future studies could examine the relationship between age and social pressure to become a mother.

### **Implications for Theory**

Three theoretical frameworks were used to guide the present study. These included Crisis Theory, the Transactional Theory of Stress and Coping (Lazarus & Folkman, 1987) and the Developmental Theory of Infertility (Diamond et al., 1999).

Crisis theory asserts that a crisis is a condition of distress and disorganization (Slaikeu, 1990). In many cases, infertility is seen as the first major crisis a woman experiences. What differentiates the event as a crisis or a manageable stress is an individual's perception. To combat crisis individually, coping skills must be used, tested, and refined in order to successfully alleviate the stress. Pittman (1987) theorized that a crisis confronting a couple provides an opportunity for necessary changes to be made that may have not occurred without it. When coping skills are not properly utilized individually and changes are not made as a couple, the individual is at risk for disequilibrium, commonly including feelings of tension, incompetence and helplessness. The precipitating event before potential crisis in this study is the diagnosis of infertility. Crisis theory has relevance within this study as seen in the interactions between coping styles and strategies used to manage the stress of infertility and their individual well-being, or perhaps, risk of disequilibrium. Women with higher levels of marital satisfaction and higher scores in the area of space were more likely to maintain more positive well-being, or be at a lower risk for disequilibrium. Women with higher scores on the subscales of *Avoidance* and

*Task* were more likely to maintain poorer well-being, placing them at a higher risk for disequilibrium.

The transactional theory of stress and coping posits it is the interactions between the person and their environment that have the potential to create stress. Within this study, the theory states that the adjustments made by the woman in reaction to the experienced stress is based on available resources, coping processes and developed meanings. In this study these factors are represented through the woman's relationship with her partner, her coping style, the coping strategies she uses, and other demographic factors such as education level, income, and location. It is the combination of these areas that create her personal environment, contribute to her individual well-being, and serve to prevent a significant degree of stress.

The final theory guiding this study is the developmental theory of infertility developed by Diamond et al. (1999). The theory proposes five phases of infertility known as: (a) dawning, (b) mobilization, (c) immersion, (d) resolution, and (e) legacy. According to this theory, the women who participated in this study could all be clustered into the immersion phase of infertility. In this phase, the woman has already received a formal diagnosis of infertility and has begun further testing and medical treatments. This phase involves a constant state of limbo from month to month, therefore, the combination of variables in this study will determine whether her transition into the resolution phase has been one of lesser or greater strain.

### **Implications for Counseling Practice**

Providing psychological therapy to individuals dealing with infertility has become more and more prevalent. It is now quite common for women or couples with infertility to seek therapy for assistance through the experience. However, they often seek counseling once the experience has taken a negative toll on their individual well-being or on their relationship with their partner. The results of this study can provide a helpful framework for therapists and

medical professionals working in the field of infertility as well as infertile women. It provides an understanding of “red flags”, or warning signs, that may assist all three of these groups in predicting a possible decline in individual well-being before a woman reaches a true state of crisis with her infertility experience.

The study identified five significant predictors of individual well-being: (a) use of *Emotion* oriented coping, (b) use of *Avoidance* oriented coping, (c) score on the IMS, (d) use of strategies of increasing *Space*, and (e) use of *Task* oriented coping strategies. Participants with high scores on the subscales of *Avoidance* and *Task* were more likely to have poorer degrees of individual well-being while those with higher levels of marital satisfaction and higher scores on the subscales of *Emotion* and *Space*, had better individual well-being. Counselors and medical professionals that become aware of these predictors may be able to use this information to assess the individual well-being of their patients and clients and take preventative steps, such as a physician referring a patient for counseling to help them improve their well-being before it becomes detrimental to their physical or emotional health.

Few assessment tools are available to therapists to assess infertility-specific issues arising in their clients. The *Coping Inventory for Stressful Situations* and the *Index of Marital Satisfaction* may serve as good tools for therapists to use with infertile women. Therapists may be able to use the scores from each of these inventories to cater their work with these clients to strengthen the areas that best predict positive well-being and reduce the coping skills and strategies that are shown to be ineffective at maintaining well-being.

### **Summary**

This chapter provided a discussion of the sample demographics, results, study limitations, and implications for future research, theory, and practice. Overall, the findings indicated a significant association between age and the subscales of *Emotion*, *Space*, and *Beliefs*. The

findings further suggested that *Avoidance* and *Task* behaviors were negative predictors of individual well-being while high marital satisfaction and use of *Space* were positive predictors of individual well-being. These findings expand on the body of literature related to infertility, mental health, and counseling. Future studies can focus on a variety of factors related to the current research to better describe the population and their infertility experience. An understanding of how age impacts coping as well as positive and negative predictors of well-being serve as an insightful tool for therapists into the experience of their infertile female clients.

## APPENDIX A

### DEMOGRAPHIC DATA FORM

Will you please share some information about yourself and your fertility treatments – Thank you so very much!

Your age \_\_\_\_\_

## Your Completed Educational Level

- Elementary/Middle School
  - High School
  - Some college (did not graduate)
  - Associates degree (2 year)
  - Bachelors degree (4 year)
  - Masters degree
  - Specialists degree
  - Doctorate (e.g., PhD., Ed.D, etc.)
  - Professional (e.g., J.D., Medical)

## Your Ethnic/Cultural Identification

- Caucasian       Asian/Pacific Islander  
 Hispanic       Native American  
 Caribbean       Mixed Cultural/Ethnic  
 African American       Other \_\_\_\_\_

Your approximate household income \_\_\_\_\_

In what city and state do you currently live?

When did you begin unprotected sex for the purpose of conceiving a child?  
(for example Month 10 Year 2002) Month \_\_\_\_\_ Year \_\_\_\_\_

When did you become aware of an infertility problem?      Month      Year

When did you first seek a diagnosis for an infertility problem?      Month      Year

**What fertility treatments have you used to treat infertility?**

(please answer for all that apply)

## Counseling

Worship Leader \_\_\_\_\_

Surgical Repair       Yes       No      number of times \_\_\_\_\_

Artificial insemination  Yes  No number of times \_\_\_\_\_

Sperm/Egg Donation  Yes  No number of times \_\_\_\_\_

In Vitro Fertilization       Yes       No      number of times \_\_\_\_\_

**APPENDIX B**  
**PHYSICIAN LETTER**

Dear Doctor,

I am a doctoral student in the Department of Counselor Education at the University of Florida. I would like to ask for your assistance in my research study to investigate the influence of supportive factors in the emotional well-being of women currently undergoing treatment for infertility. I will be conducting a survey of married women between the ages of 18 and 45 currently receiving treatment of any type for infertility. I am asking for your permission to make information about this survey available to your current patients.

Participants will be asked to complete a brief survey (approximately 15-20 minutes) evaluating coping mechanisms, marital satisfaction, and demographic information as related to individual well-being. Participants may complete this survey in an Internet or paper-based form. Participation in the study is anonymous and there is little to no risk involved. In exchange for your assistance with this research, I would be happy to provide you with the research findings at the conclusion of the study.

If you would like to know more information about this study or would like to offer your assistance, please feel free to contact Heather Hanney, Ed.S., LMHC at 561-319-8299 or [hh1@ufl.edu](mailto:hh1@ufl.edu).

Thank you for your consideration,

Heather Hanney, Ed.S., LMHC  
Doctoral Candidate  
University of Florida

APPENDIX C  
FLYER

**Infertility Research Study**  
**Be part of an important infertility research study!**

**Are you a married woman between 18 and 45 years of age?**

**Are you *currently* receiving treatment for infertility?**

If you answered **YES** to these questions, you may be eligible to participate in a research study evaluating the impact of infertility treatment.

The purpose of this research study is to investigate the impact of infertility treatment on the emotional well-being of women.

Participants are being asked to complete a brief survey available online or in paper form. Your participation will benefit the areas of medicine and counseling as well as other women and couples experiencing infertility. If you would like to take the survey online just click on this link (<http://www.surveymonkey.com/s/infertility>). If you would prefer a paper copy please contact me. This study is being conducted by Heather Hanney, a doctoral candidate in the Counselor Education department of the University of Florida.

Please contact Heather Hanney at 561-318-8299 or [hlh1@ufl.edu](mailto:hlh1@ufl.edu) for further information.

## APPENDIX D

### POSTING FOR INTERNET CHAT ROOMS

#### **PARTICIPATE IN A RESEARCH STUDY**

If you are a married woman between the ages of 18 and 45 **currently** undergoing treatment for infertility, you are invited to participate in a research study to evaluate the impact of infertility on your personal and emotional well-being. Participants are being asked to complete a brief survey available online or in paper form. Your participation will benefit the areas of medicine and counseling as well as other women and couples experiencing infertility. To take the survey online simply use this link: <http://www.surveymonkey.com/s/infertility> . If you would prefer a paper copy please contact me. If you have any questions, please contact Heather Hanney, Ed.S., LMHC at 561-319-8299 or [hlh1@ufl.edu](mailto:hlh1@ufl.edu), by September 30, 2010.

APPENDIX E  
COVER LETTER - PAPER

Dear Potential Participant,

I am writing to invite you to participate in a study of women **currently** undergoing treatment for infertility that I am conducting for my doctoral dissertation at the University of Florida. This study aims to learn about the influences of supportive factors in a woman's emotional well-being during treatment for infertility. I am asking women throughout the southeastern United States to take a brief survey regarding their experiences during fertility treatment. Results from the survey will help to medical and counseling professionals to gain a better understanding of the emotional experience of a woman through this process to help them provide more comprehensive care to their patients. The results will also allow women and couples going through the process of treatment to be able to better prepared for the experience. It is my belief that you have a unique perspective that is valuable to the advancement of medicine and counseling and to the development of new knowledge about how women and couples progress through treatment for infertility.

Your answers to this survey will be anonymous, and your participation in this study is voluntary. You have the option to complete the survey online or through regular mail. In either format, the study should take approximately 15-20 minutes to complete. If you wish to complete the survey on-line, please type the following web-site address into your browser:

<http://www.surveymonkey.com/s/infertility>

If you wish to complete the enclosed paper-based survey, please return it in the enclosed envelope. Please ensure that you have read the enclosed informed consent and indicated that you agree to participate.

If you have any questions about this study, I would be happy to answer them for you. I can be reached via e-mail at [hlh1@ufl.edu](mailto:hlh1@ufl.edu) or at phone number 561-319-8299. Thank you very much for participating in this important study!

Sincerely,

Heather Hanney, Ed.S., LMHC  
Doctoral Candidate  
University of Florida

**APPENDIX F**  
**CONSENT FORM - PAPER**

Dear Participant,

Thank you for taking the time to participate in this research study. The purpose of this study is to examine the contribution of women's coping processes and marital satisfaction in predicting the individual well-being of married females currently experiencing infertility. The information you provide can potentially benefit the fields of medicine and counseling as well as other women experiencing infertility.

If you agree to volunteer in this study, you will be asked to complete a survey consisting of four sections. The first section consists of a demographic questionnaire consisting of basic background information. In the second section, you will be asked to provide information regarding the ways in which you cope with stressful situations. The third section will include questions about your current marital relationship. Lastly, you will be asked about the amount of emotional stress and strain you have recently experienced.

Completing this survey is voluntary. You may withdraw your consent at any time without any penalty. You do not have to answer any questions you do not wish to answer. Your responses will be anonymous, since your name or contact information will not be connected to any of your data. Please respond as honestly and thoroughly as possible. There are no anticipated risks to you for participating in this survey.

In order to thank you for taking the time to complete this survey, I would like to provide you with a summary of the results of this study upon the completion of this research project. If you wish to request a summary of the results, please send an e-mail to [hlh1@ufl.edu](mailto:hlh1@ufl.edu), including the where you would like the summary to be mailed. Your request for the results of the study will not be connected to your responses and will remain confidential. There are no other benefits to you for participating in this study.

If you have any questions concerning the survey, please contact me by e-mail at [hlh1@ufl.edu](mailto:hlh1@ufl.edu). Alternatively, you may contact my supervisor, Dr. Ellen Amatea at the Department of Counselor Education, University of Florida, P.O. Box 117046, 1215 Norman Hall, Gainesville, FL, 32611-7046; phone (352) 273-4322; e-mail: [eamatea@coe.ufl.edu](mailto:eamatea@coe.ufl.edu). Questions or concerns about the rights of participants in this study can be directed to the UFIRB Office, Box 112250, University of Florida, Gainesville, FL, 32611-2250; phone (352) 392-0433.

By placing a check mark the "I Agree" square on page one of your survey, you are stating that you have read and understand the procedure described above and voluntarily agree to participate in this survey. Once you have indicated your consent, you may begin the survey.

Thank you once again for your time!

Sincerely,

Heather Hanney, M.Ed., Ed.S.  
Doctoral Candidate  
Principal Investigator

## APPENDIX G

### CONSENT FORM - INTERNET

Dear Participant,

Thank you for taking the time to participate in this research study. The purpose of the study is to examine the contribution of women's coping processes, marital satisfaction, and descriptive variables in predicting the individual well-being of married females currently experiencing infertility. The information you provide will potentially benefit the fields of medicine and counseling as well as other women experiencing infertility.

If you agree to volunteer in this study, you will be asked to complete a survey consisting of four sections. The first section consists of a demographic questionnaire consisting of basic background information. In the second section, you will be asked to provide information regarding the ways in which you cope with stressful situations. The third section will include questions about your current marital relationship. Lastly, you will be asked about the amount of emotional stress and strain you have recently experienced.

Completing this survey is voluntary. You may withdraw your consent at any time without any penalty. You do not have to answer any questions you do not wish to answer. Your responses will be anonymous, since your name or contact information will not be connected to any of your data. Please respond as honestly and thoroughly as possible. There are no anticipated risks to you for participating in this survey.

In order to thank you for taking the time to complete this survey, I would like to provide you with a summary of the results of this study upon the completion of this research project. If you wish to request a summary of the results, please send an e-mail to [hlh1@ufl.edu](mailto:hlh1@ufl.edu), including the address where you would like the summary to be mailed. Your request for the results of the study will not be connected to your responses and will remain confidential. There are no other benefits to you for participating in this study.

If you have any questions concerning the survey, please contact me by e-mail at [hlh1@ufl.edu](mailto:hlh1@ufl.edu). Alternatively, you may contact my supervisor, Dr. Ellen Amatea at the Department of Counselor Education, University of Florida, P.O. Box 117046, 1215 Norman Hall, Gainesville, FL, 32611-7046; phone (352) 273-4322; e-mail: [eamatea@coe.ufl.edu](mailto:eamatea@coe.ufl.edu). Questions or concerns about the rights of participants in this study can be directed to the UFIRB Office, Box 112250, University of Florida, Gainesville, FL, 32611-2250; phone (352) 392-0433.

By placing a check mark the "I Agree" square on page one of your survey, you are stating that you have read and understand the procedure described above and voluntarily agree to participate in this survey. Once you have indicated your consent, you may begin the survey. Please include this informed consent in the envelope in which you return your completed survey.

Thank you once again for your time!

Sincerely,

Heather Hanney, M.Ed., Ed.S.  
Doctoral Candidate  
Principal Investigator

To state that you have read and understand the procedure described above and voluntarily agree to participate in this survey, click on the "I agree" button below. Once you click on the button, you will be taken to the beginning of the survey.

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## BIOGRAPHICAL SKETCH

Heather Lynne Hanney was born in Norristown, Pennsylvania. The only child of Dennis and Laura-Lee Hanney, she spent her first 4 years in Fayetteville, North Carolina, then moved to Florida where she grew up in Palm Beach Gardens and Jupiter. She graduated from The Benjamin School in 1997. She received her Bachelor of Science degree in psychology in 2001, her Master of Education and Specialist in Education degrees in marriage and family therapy in 2004.

Heather began her doctoral studies marriage and family therapy at the University of Florida in 2004. Along with her studies, she worked with Meridian Behavioral Healthcare in Gainesville, FL, as an emergency screener and Alternate Family Care and the Parent-Child Center in Palm Beach County as a child and family therapist. Heather was an instructor for the Family & School Collaboration course in the College of Education for 2 semesters, assistant clinical coordinator for the Advanced Family Clinic in the Department of Counselor Education, and served as a teaching assistant for two masters-level courses in Counselor Education. She received her Doctor of Philosophy in marriage and family therapy from the University of Florida in 2010.

Heather married Brian Rask in 2008 currently resides in South Florida. She works as a child and family therapist for the Parent-Child Center in Riviera Beach and maintains a private practice in Palm Beach Gardens. She received her Ph.D. from the University of Florida in the fall of 2010.