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**CONTRIBUTIONS OF EMOTION-FOCUSED AND  
PROBLEM-FOCUSED COPING, MARITAL ADJUSTMENT,  
AND SOCIAL SUPPORT ON TAIWANESE WOMEN'S  
DISTRESS WHILE UNDERGOING ASSISTED  
REPRODUCTIVE TECHNOLOGIES**

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by

**Yao-Hua Wang, B.S., M.S.**

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## **Dedication**

To the Lord who is my strength and life

To my mother, my husband, and my daughter who are my greatest supporters

And in memory of my father

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This research examined changes in and relative contributions of coping, marital adjustment, and social support on Taiwanese women's experience of distress during three stages of an assisted reproductive technology (ART) cycle. Lazarus and Folkman's theory of stress and coping (1984) was used to guide this study. A longitudinal repeated measures study design was used. Seventy-four married Taiwanese women, aged 25-45, receiving ART were recruited and data were collected at ovulation stimulation, embryo transfer, and the day of the pregnancy test but before the results were given. The Ways of Coping



Questionnaire, the Infertility-Specific Distress Scale, the Taita Symptom Checklist, the Dyadic Adjustment Scale, and the Personal Resource Questionnaire-85 were used in this study.

Results showed statistically significant changes in problem-focused coping and social support scores across the three data collection times. Additionally Problem-Focused Coping (PFC) was used less frequently than Emotion-Focused Coping (EFC) across all three time periods; however, PFC use was most frequent at embryo transfer. Social support decreased as women progressed toward the end of the ART cycle. No significant changes in emotion-focused coping, marital adjustment, and infertility-specific distress scores across the three measurement times were found.

Findings indicated that social support moderates the relationships between coping and infertility-specific distress and between coping and psychological symptoms. A linear combination of the PFC and EFC, marital adjustment, and social support explained 25.4% ( $p < .05$ ) of the variance in infertility-specific distress at time 1 and 17.3% ( $p < .05$ ) of the variance at time 2. Additionally, 36.5% of the variance in Taita Symptom Checklist (TSC) scores was accounted for by the above linear combinations. PFC was the major predictor of infertility-specific distress at time 1 and time 2 and for severity of psychological symptoms at time 3. Thus, Taiwanese women in this sample employed both emotion-focused coping

and problem-focused coping to manage the distress of ART treatments, however, women who perceived less social support were likely to experience higher levels of infertility-specific distress than were the other women in the sample.

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## **Chapter I: Introduction**

Fifty to eighty million couples in the present global population have experienced infertility problems (Rowe & Farley, 1988). Since the birth of the first baby conceived through in-vitro fertilization and embryo transfer (IVF-ET) in 1978 in England (Steptoe & Edwards, 1978), new techniques of assisted human reproduction have been developed to enable previously infertile couples to achieve pregnancy. This dissertation study focuses on the coping and distress of Taiwanese women who undergo assisted reproduction.

Infertile women usually consider assisted reproductive technology (ART) treatment as the last hope for becoming mothers. However, ART procedures are often highly distressful. Women going through ART undergo multiple invasive, highly expensive medical procedures, and the probability of achieving a pregnancy remains only approximately twenty percent per ART cycle. These factors generate tremendous psychological distress, and women undergoing ART must exert considerable efforts to cope with it (Millard, 1991).

### Use of Assisted Reproductive Technology

With the advancement of medical technology there has been a rapid growth of ART use in the United States and other countries in the past two decades (Blank, 1990). Many infertile couples who in the past could not achieve pregnancy now can conceive a child through ART treatments. The numbers of

ART cycles performed in America have increased 16-fold from 1985 to 1998 (Centers for Disease Control, 2000; Meikle, Danel & Wilcox, 1999). In 1998 in the U. S. there were 28,500 live births as a result of ART procedures (Centers for Disease Control, 2000). The growing demand for ART services has also been observed in Taiwan, with a total of 6,573 ART cycles completed in 1998 (Taiwan Department of Health, 2000).

Although ART increases infertile individuals' opportunities to conceive biological children, evidence is mounting that ART procedures generate significant psychological distress to couples (Leiblum, Aviv, & Hamer, 1998; Slade, Emery, & Lieberman, 1997). Women, as the focus of infertility examinations and treatments, are particularly likely to experience psychological distress, heightened physical discomfort, increased symptoms of depression, and changes in intimate relationships with their spouses (Berg & Wilson, 1991; Ulbrich, Coyle & Llabre, 1990). Thus, there is a need to understand women's coping with ART and factors that affect coping.

### Coping with Assisted Reproductive Technology

Women who participate in the four-week long cycle of ART report that levels of psychological distress change with different stages of the ART cycle (Berg & Wilson, 1991; Slade et al., 1997). These findings support Lazarus and Folkman's (1984) conceptualization of coping as a process which may change

over time. The woman experiencing emotional changes makes efforts to change her behaviors or thoughts to manage the situations she perceives as exceeding her resources (Bringhenti, Martinelli, Ardeni, & LaSala, 1997). The characteristics of coping with ART are dynamic and are a situation-dependent response to adverse conditions (de Ridder, 1997).

Coping is considered a process-oriented activity (Lazarus & Folkman, 1984). Two forms of coping addressed in Lazarus and Folkman's (1984) theory of stress and coping are problem-focused and emotion-focused coping. Although emotion-focused and problem-focused coping function differently in response to the distress of infertility, infertile women use emotion-focused coping to regulate the psychological distress of the treatment, and problem-focused coping to guide behavioral responses to the demands of the reproductive technology (Stanton, 1991).

Women may use both emotion-focused coping and problem-focused coping strategies in response to the distress of the reproductive technology treatment (Stanton, 1991). The theory details two forms of coping: problem-focused and emotion-focused coping. Although both represent efforts to manage distress, emotion-focused coping is directed toward regulating the emotional impact of a distressful encounter. In contrast, problem-focused coping involves direct efforts to modify the situation that has provoked the distress (Lazarus &

Folkman, 1984; McQueeney, Stanton, & Sigmon, 1997). Both emotion-focused and problem-focused coping strategies may be adopted by women receiving IVF to successfully manage their negative feelings about infertility and the demands of infertility treatment (Woollette, 1985). Yet little is known about the contribution of these two forms of coping strategies used by Taiwanese women in dealing with the distress of reproductive technology. The functions of the two coping strategies on Taiwanese women's experience of distress while undergoing ART were investigated in this study.

#### Factors Related to Coping with the Distress of ART

Little is known about the factors influencing Taiwanese women's coping with the distress of invasive infertility treatments. From the review of the literature, two central concepts, marital adjustment and social support, have been found to be associated with women's coping with ART. Couples encounter challenges of marital cohesion when wives are undergoing intrusive reproductive treatments (Epstein & Rosenberg, 1997). Callen and Hennessey (1989) stated that assisted reproductive technologies are emotionally demanding procedures, but asserted that couples in a satisfying intimate relationship could succeed in completing ART. Studies also indicate that marital adjustment is related to women's coping with the distress of infertility (Levin, 1997; Morrow, Thoreson & Penney, 1995). However, the samples were limited to women who were

infertile but had not experienced reproductive technology. Therefore, the influence of marital adjustment on Taiwanese women's distress while receiving Assisted Reproductive Technology was further explored in this study.

Another concept relevant to women's coping with the distress of ART is social support. Support from significant others may buffer the individual's emotional distress and boost coping (Turner, 1983; Thoits, 1986). Thus, social support from significant others may buffer the distress of the infertility. Research has suggested that partners' support may contribute to the augmentation of infertile women's management of distress while undergoing medical treatment for infertility (Abbey, Andrews, & Halman, 1991). Abbey et al. (1991) found that some women perceived the support from their partners during the process of ART was inadequate. Therefore, the influence of the support from significant others needs to be examined in this study.

### Purpose

The purpose of this research was to examine changes in and relative contributions of problem-focused and emotion-focused coping, marital adjustment, and social support on Taiwanese women's experience of the distress during three stages of an assisted reproductive technology (ART) cycle. Previous research on women's coping with the distress of ART has been conducted in Western populations (Stanton, Tennen, Affleck, & Mendola., 1991; McQueeney,

et al., 1997). There is a paucity of research incorporating marital adjustment and social support to study women's coping with the distress of ART in a Taiwanese population. Thus, results of this dissertation study may provide foundational knowledge about the factors contributing to Taiwanese women's coping with the distress of ART.

### Significance of the Study

Findings of this study contribute to nursing and women's health care for infertile women receiving ART in Taiwan in the following aspects. First, knowledge gained through this study increases understanding of the phenomenon and allows generation of appropriate conceptual frameworks to examine Taiwanese women's coping with the distress of ART treatments. Second, results obtained from this study increase understanding of the processes of coping across different stages of the ART cycle. Third, this study facilitates exploration and explanation of the relative contributions of marital adjustment and social support to infertile women's coping with the distress of ART in Taiwanese society. Fourth, results of this study increases nursing clinicians' recognition of women's needs through the process of ART. Lastly, this study is fundamental to the design of effective nursing interventions to assist Taiwanese women to cope with the distress of ART.

### Statement of Problem/Research Questions

In response to the rapid growth of the population receiving ART in Taiwanese society, it is critical for nursing professionals to understand women's responses to the treatments and to assist them to cope with ART while promoting their health. Although 40-50% of infertility is related to the male factor, male infertility is rarely acknowledged in Taiwanese culture. Women are still the primary focus of infertility treatments, even when both the male and female have documented infertility profiles (Wu, 2000). Thus, in Taiwan, women are the main recipients of treatment, and they experience high levels of physical discomfort and psychological distress as a result of the complexity of the ART procedures, invasive diagnostic examinations and surgeries (Ling, 1999).

This study of ART use by Taiwanese women investigated the ways of coping that women used to manage the distress resulting from ART procedures, and examined the contributions of marital adjustment and social support to Taiwanese women's coping with the distress of ART.

### Research Questions

Research questions for this study focused on whether infertility-specific distress, emotion-focused coping, problem-focused coping, marital adjustment, and social support change across the three data collection times during the ART cycle. Therefore, the following questions were analyzed:



1. Are there patterns of relationships among the Ways of Coping Questionnaire items across times 1, 2, and 3?
2. Do coping scores change over times 1, 2, and 3?
3. Do Infertility-Specific Distress scores change over time 1, 2, and 3?
4. Does social support function as mediator or moderator effect on infertility-specific distress and global severity of psychological symptoms?
5. Do the major variables change over time?
6. What are the relative contributions of emotion-focused coping, problem-focused coping, marital adjustment, and social support on Taiwanese women's experience of distress while receiving assisted reproductive technology?

### Conceptual Framework

#### Theory of Stress and Coping

In 1984 Lazarus and Folkman published their transaction theory of coping (Lazarus & Folkman, 1984). Their theory differed from the traditional stimulus-response, psychophysiological conception of coping (Holahan, Moos, & Schaefer, 1996). Their theory emphasized the individual's subjective experience and considered the interaction of environmental factors as significant influences in the individual's coping with a distressful event (Lazarus & Folkman, 1984). When a

stressor is encountered, an individual first evaluates the potential threat or harm, and then appraises his or her ability to change the situation and manage negative emotional responses. A person will make cognitive efforts to manage the problem or regulate emotional arousal engendered by the distressful transaction. Coping in Lazarus and Folkman's theory is defined as "constantly changing cognitive and behavioral efforts to manage specific external and /or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984; p.141). As described previously, Lazarus and Folkman's transaction theory includes both problem-focused and emotion-focused coping.

#### Emotion-focused coping.

One of the functions of emotion-focused coping is to decrease psychological distress. A person may use emotion-focused coping strategies such as avoidance, minimization, and selective attention to cope with a distressful encounter (Lazarus & Folkman, 1984). Another function of emotion-focused coping is to change an individual's cognitive construction of a distressful encounter. Even though the actual situation is not changed by use of emotion-focused coping strategies, a person reconstructs the meaning of the distressful encounter to him or her. Thus, the distress is diminished (Lazarus & Folkman, 1984). An example of employing emotion-focused coping is that an infertile

woman may decide that there are more crucial things in her daily living than ART. Some behavioral coping strategies, like seeking emotional support and participating in physical exercises, function as emotion-focused strategies. These two behaviors do not change the distressful encounter directly, but distract one's focus from the transaction itself (Lazarus & Folkman, 1984). By using emotion-focused coping strategies, infertile women manage the emotional distress of the ART treatment process (Callan & Hennessey, 1989).

By using emotion-focused coping strategies, infertile women may gradually reduce the emotional intensity of their feelings about infertility treatment. Conclusions from previous research suggest that the use of emotion-focused coping strategies to cope with infertility treatment may not reduce the distress significantly. Limitations of these studies are that the data were collected from women retrospectively, and time and environmental factors may have affected the women's responses. Moreover, emotion-focused and problem-focused coping strategies should not be examined independently because they are two interdependent subsets of coping (Lazarus, 2000).

#### Problem-focused coping.

Problem-focused coping is directed at the problem of how to manage the distressful situation (Lazarus & Folkman, 1984; Lerman & Glanz, 1997). When using problem-focused coping strategies a person makes efforts to collect relevant

information to resolve the distressful encounter. Efforts are aimed at producing alternative resolutions, judging the benefits and costs of these alternatives, and executing the selected option (Lazarus & Folkman, 1984). Examples of problem-focused coping strategies are altering environmental pressures, barriers, resources and procedures, changing motivation, reducing self involvement, finding alternative channels of gratification, developing new standards of behavior, or learning new skills and procedures (Lazarus & Folkman, 1984). Utilization of problem-focused coping helps women to focus on meeting the demands of infertility treatment (Callan & Hennessey, 1989).

Lazarus and Folkman stated that emotion-focused coping and problem-focused coping usually occur simultaneously and that there are no absolutely effective or ineffective coping strategies in managing distress (Folkman, Lazarus, Gruen, & Derogatis, 1986; Lazarus & Folkman, 1984). Measurement of an individual's coping needs to be described in detail, in terms of an individual's thinking or action toward each specific distressful encounter at each stage. Lazarus and Folkman (1984) point out that this use of both strategies simultaneously may be beneficial, or the two strategies may interfere with each other (Lazarus & Folkman, 1984). In managing the distress of ART, different methods of coping may be used during different stages of treatment.

### Infertility specific distress.

Lazarus and Folkman's transactional theory may be useful in increasing understanding of the phenomenon of infertility treatment-related distress. According to their theory, an event can be perceived as distressful or not. Infertility treatment could be a distressful experience if a woman perceives the treatment as burdensome or exceeding her resources and impeding her well-being (Lazarus & Folkman, 1984). Infertile women may experience infertility treatment as especially distressful if motherhood is the most crucial goal in their lives (Clark, Henry & Taylor, 1991). In addition to the considerable discomfort of infertility medical treatment, repeated failures to achieve pregnancy and the social stigma of childlessness are factors that may contribute to women's awareness of negative impacts of infertility treatment (Clark et al., 1991; Stanton, 1991). Thus, the Lazarus and Folkman's transactional theory seems particularly applicable to infertility treatment-related distress.

### Severity of psychological symptoms.

In addition to the intense emotions that often are engendered by infertility, women may also experience symptomatic psychological distress arising from the complex medical processes of infertility treatment (Morrow et al., 1995; Stanton, et al., 1991). Studies show that women receiving ART do not exhibit a higher incidence of major psychosis than the general population (Demyttenaere, et al.,

1998). However, several researchers have found that women who did not achieve pregnancy through ART reported more psychological symptoms than did the general population (Hynes, Callan, Terry, & Gallois, 1992; Litt, Tennen, Afleck, & Klock, 1992). Thus, there is a need to examine the severity of psychological symptoms of women undergoing ART.

#### Marital adjustment.

Marital relationships may change after a diagnosis of infertility and the results of ART treatments (Berg & Wilson, 1991). Berg and Wilson (1991) studied the impact of infertility on couples' marriages. Following the infertility diagnosis the quality of the marital relationship declined. On the other hand, marital discord may also diminish after the beginning of infertility treatment (Ravel, Slade, Buck, & Lieberman, 1987). Successful coping with the distress of infertility treatment may increase couples' commitment and closeness, resulting in increased marital cohesion and marital satisfaction (Ravel, et al., 1987, Leiblum, et al., 1998).

Examination of the effects of coping strategies on marital satisfaction scores indicate that couples who adopted more emotion-focused coping strategies were less satisfied with their marital relationships than were couples using more problem-focused coping strategies (Morrow, et al., 1995; Levin, 1997). Emotion-focused coping strategies, such as self-blame or avoidance, were associated with a

higher level of psychological distress (Morrow et al., 1995; Levin, 1997). The use of problem-focused coping strategies, such as information-seeking and cognitive restructuring of the problem, may be related to less psychological distress resulting from ART treatment (Morrow et al., 1995). Women undergoing ART reported that the use of specific problem-focused coping strategies was related to more satisfactory marital relationships (Levin, 1997). The contribution of marital adjustment to Taiwanese women's coping with the distress of ART was identified in this dissertation study.

#### Social support.

Numerous studies demonstrate that increased social support mitigates the adverse psychological impacts of distressful life events and enhances coping (Cohen & Willis, 1985; Thoits, 1986). Thus, social support in this study is defined as perceived support from others. Social support is referred to as a "human climate" that facilitates an individual's functioning in daily activities when confronting distressful events (Brandt & Weinert, 1981). Social support impels a person to build social connections that can help the person withstand distressful encounters (MacElveen, 1986). Women undergoing ART need high levels of support from partners or significant others. Results of previous studies have shown that social support may exert a mitigating effect on women's well-being during ART (Abbey et al., 1991). Brandt and Weinert (1981) conducted

studies to refine the concept of social support. They found that perceived social support seems to be the most valid measure of the extent to which persons are accepted, obtain support, and are loved.

In summary, each woman's experience of receiving ART is considered unique (Leiblum, 1997). Lazarus and Folkman's (1984) theory of stress and coping is useful as a framework in nursing research because the major concepts of the theory are compatible with the major paradigm concepts within nursing: person, environment, health and nursing (Whall, 1996). Incorporating this theory of coping results in a better understanding of Taiwanese women's coping with the distress of ART treatments.

Use of problem-focused and emotion-focused coping strategies is related to the women's reactions to specific distresses of ART. Receiving support from the family and spouse may change the distress of ART treatment. Good marital adjustment is thought to enhance effective coping during ART treatment. Previous unsuccessful ART, and a prior pregnancy followed by prolonged infertility are considered factors associated with higher levels of distress during ART treatments (Newton, Hearn, & Yuzpe, 1990). Factors related to coping with the distress of ART treatment are depicted in Figure one.



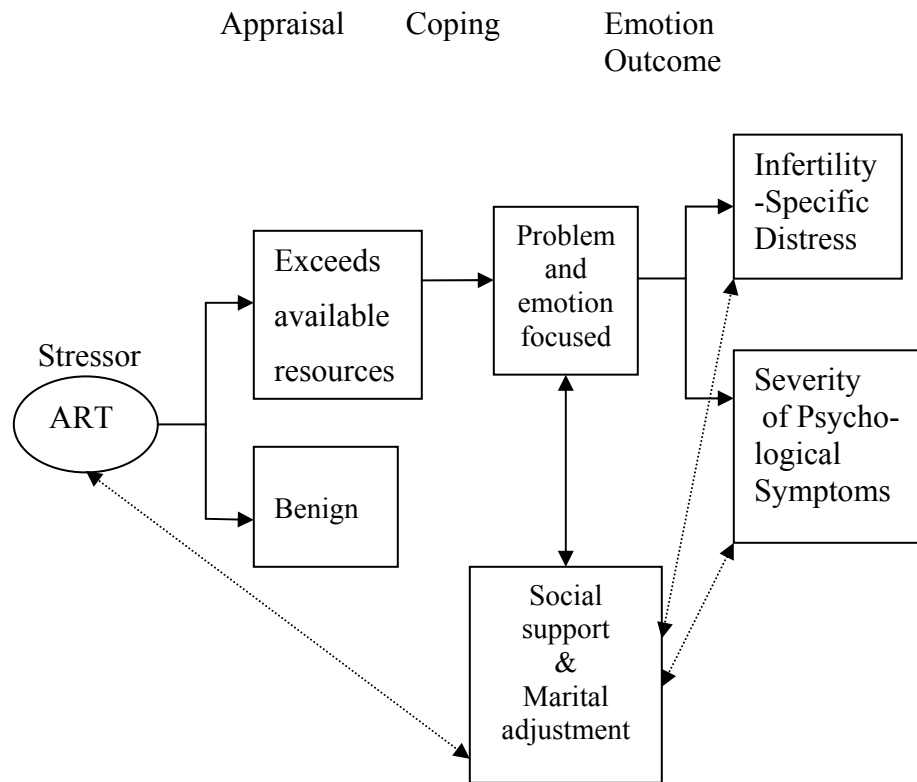


Figure 1 A conceptual framework of women's coping with the distress of receiving assisted reproductive technology

### Operational Definitions

Operational definitions of major variables are:

Infertility-Specific Distress (outcome variable): descriptions of positive and negative emotions as reported by study participants using the Infertility-Specific Distress Scale (Stanton, 1991).

Severity of Psychological Symptoms (outcome variable): levels of global psychological symptoms reported by study participants. Psychological symptoms were determined through use of the Taita Symptoms Checklist (Tsai, Ling, Wen, Soong, & Chen, 1979).

Problem-focused coping (predictor variable): frequency of behaviors and cognitions that an individual uses to deal with the distressful encounter, produce alternative resolutions, and execute the selected solution. Problem-focused coping was measured by selected subscales from the Ways of Coping Questionnaire (Lazarus & Folkman, 1984).

Emotion-focused coping (predictor variable): frequency of cognitions that an individual uses to reconstruct the meaning of a distressful encounter or frequency of behaviors that distract a person's focus from the distressful encounter itself. Emotion-focused coping was measured by selected subscales from the Ways of Coping Questionnaire (Lazarus & Folkman, 1984).

Social support (predictor variable): perceived availability of emotional and instrumental supportive behaviors, which include intimacy, social integration, nurturance, worth, and assistance from spouses, friends and family members (Weiss, 1974). Social support was measured by the Personal Resource Questionnaire 85 (Brandt & Weinert, 1981).

Marital adjustment (Predictor Variable): the degree of marital satisfaction and perception of closeness within the marital relationship as measured by The Dyadic Adjustment Scale (Spanier, 1976).

#### Assumptions

The assumptions of the study were follows:

1. Taiwanese women receiving ART would perceive the treatment as distressful.
2. Taiwanese women undergoing ART would demonstrate varied coping patterns across the stages of the treatment.
3. Perceived social support and marital adjustment interact with women's perceptions of distress of ART treatment.

#### Limitations

Studies using self-report instruments to assess subjects' coping behaviors are highly susceptible to reactive effects (LoBionfo-Wood, & Harber, 1998; Smith, Leffingwell, & Ptacek, 1999). Subjects in this study might be tempted to

answer in a particular way because of their desire to answer in a way they believed the researcher would like.

Because of the small population of women receiving ART in Taiwan, only a small sample size was feasible. Hence, results from this study might not be corroborated when other populations are selected in replication studies. In addition, use of a convenience sample limited the generalization of the study results. Internal validity might be compromised by the interaction of time period with the treatment in this longitudinal study design.

Finally, all instruments except one have been translated into Chinese and have been tested in Chinese speaking populations to validate the instruments. The translation of the English versions of the Infertility-Specific Distress Scale into Chinese might produce unavoidable measurement errors in the process of translation. Validation of the instrument needs to be replicated in a larger sample.

### Summary

In this chapter, the background of the study was introduced, the purpose of the study was stated, the problem was described and the research questions were identified. The conceptual framework was presented and variables of interest were introduced. The relevant concepts were defined, the assumptions were listed, and the limitations were presented. The following chapter examines in detail the empirical studies relevant to this study.

## **Chapter II: Review of the Literature**

Infertility is considered a health-related problem causing significant psychological distress (Olsen, Kuppers-Chinnow, & Spinelli, 1996). It is estimated that 2.1 million married couples in the United States encounter the problem of infertility, which is defined as the inability to bring a pregnancy to term after one year of sexual intercourse without contraception (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997). Infertility is not considered a life-threatening illness. However, infertility can be distressing to the psychological health of married couples. Study findings show that infertility is associated with a high frequency of psychological complaints and a decreased sense of well-being (van Balen & Visser, 1997).

With the development of new assisted reproductive techniques, more infertile couples are choosing to receive medical help to conceive a child. When couples start seeking medical help, they may undergo a series of procedures that are often costly, painful and invasive. Some diagnostic examinations such as collecting sperm samples in an institutional site and setting intercourse schedules intrude into couples' intimate relationships (Berg & Wilson, 1991). Enduring these procedures can be tremendously distressful.

This chapter includes discussions of six factors relevant to Taiwanese women's coping with the distress of ART. The first section depicts the

development of ART and the impact of the technology on infertile couples and specifically the infertile women receiving ART treatment. Trends in infertility treatment, types of ART use in Taiwan, and Taiwanese women's psychological responses to ART treatments are also described in this section. Studies related to the distress of ART treatment are incorporated in the second section. Conceptualization of and approaches to measuring coping relevant to ART are elaborated in the third section. Critique of the research relevant to women's coping with ART is also included. The effect of social support on reducing women's distress while receiving ART is discussed in the fourth section. The fifth section describes marital adjustment of women undergoing ART treatments. Studies reviewing the effects of ART on women's marital relationship are discussed. The last section examines demographic variables associated with women's coping with ART treatments.

### Development of Assisted Reproductive Technologies

#### Trends of Fertility Problems in Taiwanese Society

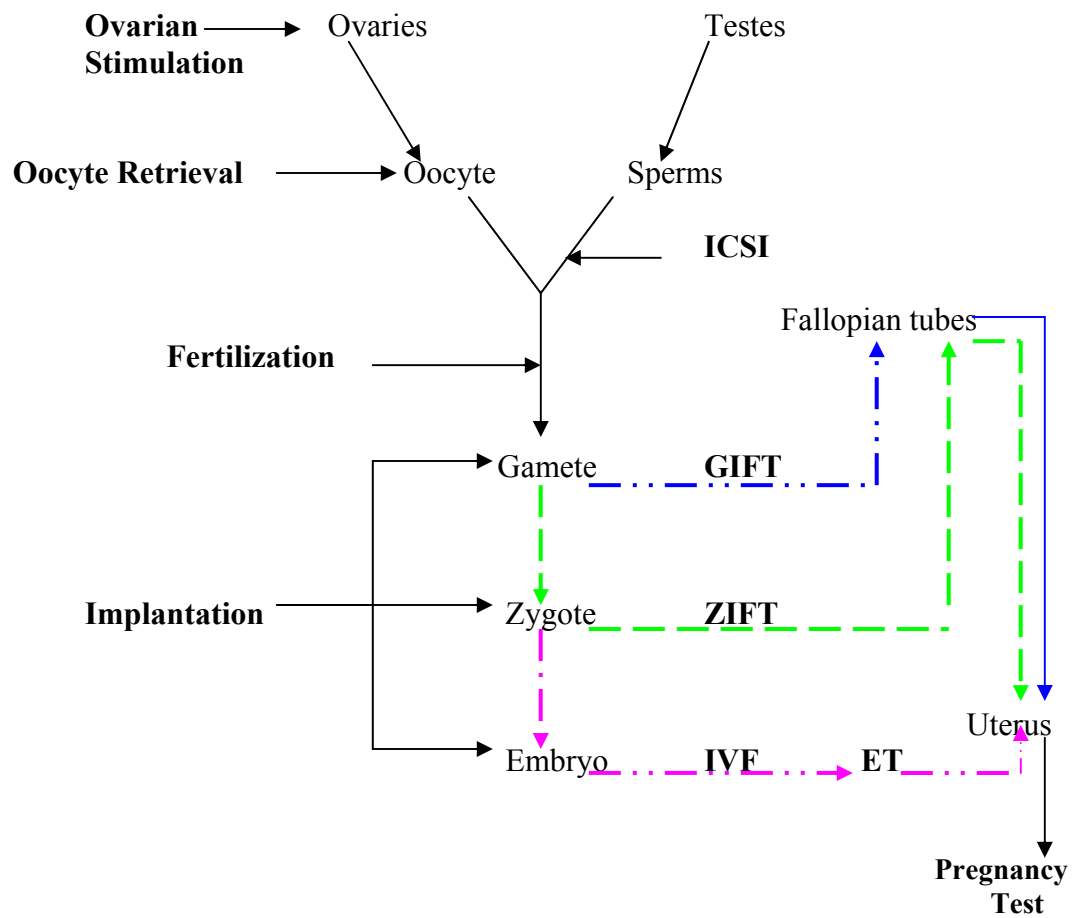
One of the crucial purposes of marriage in Taiwanese society is to produce offspring for continuity of the family line (Jwo, 1991). In the early 1950s and 1960s, large families were common (Pang, 1996). Even now having many children is considered to be a sign of blessing, and the symbol of prosperity of the whole family in Taiwan society (Yang, 1999). After World War II, a drastic drop

in the fertility rate was reported (Hermalin, Liu, & Freeman, 1994). The fertility rate in Taiwan declined from 6.6 to 1.86 children per woman from 1951 to the 1990s (Lo, 1994). This may be considered a success for fertility regulation to reduce the number of children in a family to decelerate growth of the population in Taiwan (Lee & Sun, 1995).

While the birth rate is decreasing, many married couples have encountered the problem of infertility. An investigation into rates of infertility in Taiwan in 1996 showed that about 15% of married couples were diagnosed with infertility (Bureau of Health Promotion and Protection, 1998). In response to these numbers a new family planning initiative was introduced in 1997 to help infertile couples actualize their wish to have a child (Taiwan Department of Health, 2000). Following the advancement of ART treatments, there is a need to study the effect of use of ART on Taiwanese women's psychological well-being.

#### Types of Assisted Reproductive Technology Used in Taiwan

Three types of ART are commonly used to assist human conception: in-vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), and zygote intrafallopian transfer (ZIFT). For the condition of reduced semen parameters in males, intracytoplasmic sperm injection (ICSI) is performed with IVF to facilitate conception (Grow, 1998).



**Figure 2** Diagram of different types of ART procedures

ICSI: Intracytoplasmic Sperm Injection      GIFT: Gamete Intrafallopian Transfer

ZIFT: Zygote Intrafallopian Transfer    IVF: In Vitro Fertilization

ET: Embryo Transfer



Basic ART cycles include three main stages: ovulation stimulation, oocyte retrieval, and embryo transfer (McShane, 1997). A brief picture of ART procedures is depicted in Figure 2. Ovulation stimulation starts in the first 1-3 days of the women's menstrual period (McShane, 1997). Gonadotropine injections are given daily or twice a day to ART recipients to stimulate ovulation from the early in the menstrual period until two days before oocyte retrieval. During the stimulated cycle a woman's estrogen level and ovarian response must be monitored every other day. When oocyte readiness is verified by ultrasound, vaginal ultrasound and needle aspiration will be performed to retrieve the ova from the ovarian follicles. Usually multiple oocytes are retrieved and fertilized with either the husband's or a donor's sperm. Typically three to four of the resulting good embryos are implanted into the woman's uterus to increase the success rate of pregnancy. Two weeks after implantation women undergo laboratory testing to confirm whether pregnancy has been achieved (Carcio, 1998)

Different types of ART are performed according to women's specific fertility problems. In-vitro fertilization is widely used to treat women with tubal factor infertility, male factor infertility and unexplained infertility (McShane, 1997). Women with at least one normal fallopian tube may undergo GIFT procedures. The major difference between IVF and GIFT is the location in which fertilization occurs. In GIFT, instead of growing in vitro, the oocyte and sperm

are placed into the fallopian tube. Thus, GIFT is considered a more natural human conception process. Advantages of GIFT are less laboratory complexity and higher pregnancy rates (Carcio, 1998). Zygote intrafallopian transfer (ZIFT) is similar to IVF procedures. However, the early-fertilized oocyte is transferred to the fallopian tube, not to the uterus. Benefits of ZIFT are the assurance that the oocyte has been fertilized and growth of the early embryo in a natural environment (the fallopian tube) (Carcio, 1998).

No matter what type of ART procedure is recommended by the fertility specialist, women electing to proceed with ART undergo many examinations before treatments actually begin. In the treatment period, the woman may experience stressors such as the need to take daily injections of ovulation induction medicines, numerous trips to the clinic, and invasive surgical procedures such as laparoscopy to implant fertilized eggs. These invasive procedures are a source of high levels of distress. Emotional responses to these infertility treatments may include anger, guilt, shock, denial, isolation, depression and grief (Millard, 1991). In addition, waiting for the results of ART treatment are also perceived as distressful to the woman. When going through these processes women suffer from the adverse effects of infertility treatment and require considerable effort to cope with the distress.

### Psychological Impacts of ART

When a couple realizes that they cannot bear a child through natural conception, then both wife and husband have to confront the problem of infertility and decide whether to seek medical help to achieve pregnancy. A couple may decide to undergo ART when noninvasive infertility treatments have failed to result in a live birth. Early research suggested that the quality of life of couples entering IVF was good and free from depression (Hearn, Yuzpe, Brown, & Casper, 1987). However, more studies using biochemical parameters indicated that couples experienced emotional distress as the result of ART (Facchinetti, Matteo, Artini, Volpe, & Genazzani, 1997; Lindheim et al., 1995). Because of the rapid growth of ART options, it is believed that an increasing number of infertile couples will achieve pregnancy by means of ART. Thus, understanding the psychological impacts of ART on couples is important and necessary for health care providers to assist them to cope successfully with ART procedures.

Researchers agree that women and men experience ART treatments differently (Draye, Woods, & Mitchell, 1988; Jordan & Revenson, 1999). Women usually report more emotional dysfunctions than do their partners. Emotional dysfunctions include anxiety, neurosis and depression (Eugster & Vingerhoets, 1999). Regardless of no significant evidence of increasing psychopathologic syndromes in women receiving assisted reproductive

technology, research findings have suggested that women undergoing ART show borderline scores in comparison with normative fertile populations (Berg & Wilson, 1990; Bringhenti et al., 1997)

Before a couple starts an ART cycle, they have to take into consideration whether to use artificial procedures rather than natural intercourse to achieve pregnancy. Women usually consider ART as the last option of achieving pregnancy. When ART treatment is initiated, women experience different aspects of distress in response to the process of the ART cycle (Olshansky, 1988). A certain percentage of women are unable to complete ART treatment because of failure of oocyte growth or embryo development. Unknown of what might happen during ART treatment is a source of emotional distress to the women (Seibel & Levin, 1987). Before moving forward to the stage of oocyte retrieval, women need to receive hormone injections daily to stimulate oocyte maturation and vaginal ultrasound every other day or few days to monitor oocyte development. Women experience rather intense body changes during the ovulation stimulation stage. Physicians' assurances and explanations from the ultrasound technician about oocyte maturation often decrease women's worries about insufficient numbers and quality of oocytes (Seibel & Levin, 1987).

Approximately 15% of recipients will be excluded from oocyte retrieval as the result of unsuccessful oocyte development (Centers for Disease Control,

2000). After undergoing oocyte retrieval, women receive embryo transfer 72 hours later. Literature shows that the embryo transfer stage is one of the most distressful periods of an ART cycle (Boivin & Takefman, 1995). Measuring of women's emotional distress in the embryo transfer stage and coping strategies employed is necessary. If male infertility is the indication, then, ICSI is performed to help the fertilization of oocytes to increase the possibility of success. In this case, the husband is under the distress of infertility as well as the wife is and may not be supportive to the wife (Beutel, et al., 1999). Research findings have suggested that women used more emotion-focused coping strategies to go through this stage for there is little that the couple can do to boost the success rate (McQuenney et al., 1997).

Even though the couple passes previous two stages and move forward to the end stage of the cycle, the distress level remains elevated (Slade et al., 1997). Following the embryo transfer, there are two weeks of time to discover the result of pregnancy test. Couples described feelings of emotional turmoil in this stage (Seibel & Levin, 1987). It is not surprising that every couple hopes for successful treatment. Unfortunately, only 20-30 percent of recipients conceive in any one ART cycle (Carcio, 1998; Centers for Disease Control, 2000). The majority of women inevitably encounter the probability of failure. How they cope with the anticipatory distress of failure needs to be examined in the further research.

### Taiwanese Women's Emotional Distress of ART

Historically and culturally, women in Taiwanese society are accorded the responsibility to continue the family line. The traditional social ideology of women is equivalent to reproduction (Wu, 2000). Males in Taiwanese culture traditionally do not acknowledge any responsibility for infertility (Tsui & Wong, 1972). For centuries women have been the focus of infertility examinations and treatments (Helman, 1994). Although the examination for male infertility is easy and quick, Taiwanese men are reluctant to complete a sperm test and usually wait until normal reproductive function in their wives is confirmed (Wu, 2000).

Even when the infertility is due to the male, the woman is still the recipient of ART treatment. Few Taiwanese men would admit the possibility of their being infertile (Su, Yu Chao, & Chen, 1998). When undergoing ART procedures, women experience tremendous physical discomfort and psychological distress (Su, 1991). Lee, Chang, and Chen (1997) found that women reported more distress than their male partners when undertaking ART cycles.

### Studies of Taiwanese Women's Emotional Distress of ART

Chang and Kuo (2000) studied the emotional distress of Taiwanese women during different IVF treatment stages. The distresses that women experienced through the ART cycle were changes in body image and lowered self-esteem, and a sense of guilt or self blame (Chang & Kuo, 2000). In Taiwanese communities,

infertility is considered a very private affair and it is considered taboo to even talk about it (Su, et al., 1998). Women are left to proceed through the ART process alone (Lee & Kuo, 2000). Women may also feel compelled to repeatedly receive ART to fulfill the traditional expectations to have more than one child and at least one boy (Lee, Kuo, & Lee, 2000).

Husbands may not be able to provide support to their wives as they go through ART cycles, especially when there are male infertility indications (Su et al., 1995). In a society that is still male dominated, infertile men may not want to lose face or to confront problems of infertility through actively seeking medical help to solve the infertility. Some infertile men may persuade their wives to discontinue ART treatments (Su, et al., 1998). Women feel bewildered and ambivalent when their spouses are not willing to continue ART treatments. Su et al. (1998) also found that other infertile Taiwanese men wanted their spouses to stop the ART process because they did not know how to share in the women's suffering from the invasive procedures of ART. Therefore, infertile women need support from professionals to complete the ART process. A study of ART use by Taiwanese women may provide empirical data to understand effective coping strategies that women use to go through ART. Professionals could use these findings to provide better support to both the woman and her husband.

### Conceptualization of Stress

The study of stress is one of the main research areas in the health care field. There are three major conceptualizations of stress. First, stress is defined as a stimulus, encompassing a range of stimuli from major life changes to minor daily hassles (Holmes & Rahe, 1967). The second conceptualization regards stress as a general response to physiological demands of the body (Selye, 1976). Findings from biological experiments provide evidence supporting this theoretical model, for example, disorganized or maladaptive functioning occurred when research participants were under high levels of distress (Stanton & Dunkel-Schetter, 1991). The third theory of stress is Lazarus and Folkman's (1984) transactional model. In this conceptualization, stress is situation-specific, and this allows for individual variations in response to distressful encounters. The individual uses a process termed cognitive appraisal to determine whether an event is a threat, harm, or challenge, and makes efforts to manage the distressful encounter (Lazarus & Folkman, 1984).

### Studies of the Distress of ART

Literature has documented the distress of infertility. After the introduction of human reproduction technology in 1978, there have been a number of studies of ART treatment-related distress. Kemeter (1988) was an early researcher who used a questionnaire to identify women's emotional distress during an ART cycle.



In this longitudinal study, sixty women entering an IVF program were examined to explore the relationship of emotional distress and outcomes of IVF. In comparing women who failed (n=19) and succeeded (n=41) in achieving pregnancies, results showed that women with unsuccessful oocyte fertilization exerted great efforts to overcome the negative feelings triggered by the treatment such as fear, doubts and ambivalence. A small sample size is an inevitable limitation of early studies of ART because of the small population of recipients. Although a limited number of women were investigated, findings of the study present a preliminary understanding of women's psychological reactions to ART treatment.

Both the wife and the husband are involved in the process of undergoing ART, yet they experience the emotional distress in response to the treatment differently. Women traditionally are the center of infertility treatment, regardless of the indications of infertility. Collins and associates (1992) conducted research to compare gender differences in the perceptions of distress in regard to IVF treatment. In this exploratory prospective study, two hundred couples were administered structured questionnaires to measure their feelings about infertility. Women in the sample reported higher emotional distress during treatment than did their partners but also obtained more support from others about the infertility issue. Both partners perceived that having a child is a major focus of life. Yet,

study findings suggest a difference between men and women's reactions to infertility. While women experienced social pressure to have a child, their partners did not. Men were more concerned about the effect of infertility on their social functioning and work efficiency (Collins, Freeman, Boxer, & Tureck, 1992). The extent to which social relations affect women's experience of distress when undergoing ART needs further examination.

Women embarking on infertility treatment may experience various levels of distress during the actual process of ART treatment. Previous studies of distress associated with ART have used retrospective designs in which women were asked to recall the distress they experienced (Freeman et al., 1987; Leiblum, Kemman, & Lane, 1987). Accuracy of recollection and the impact of failure to achieve pregnancy may influence women's responses. The advantage of using prospective design is that they reducing recall errors and increase understanding of changes in levels of distress across ART cycles. The prospective design allowed the researchers to examine changes in distress across various stages such as ovulation stimulation, oocyte retrieval, embryo transfer, and pregnancy testing. In order to examine the relationship of the outcomes of ART and treatment distress, retrospective data were collected at three days after women found out the results of their pregnancy tests (Freeman et al., 1987; Leiblum, Kemman, & Lane,

1987). Women in the study were given the questionnaire to rate their distress across different stages of the ART cycle.

Results from the prospective data suggest that women reported high distress throughout the treatment cycle (Boivin & Takefman, 1995). However, results from the retrospective data showed that the 2-week period prior to the pregnancy test was the most distressful period in the whole treatment cycle. The authors suggested that the discrepancy between the prospective and retrospective data was due to the women's trying to manage expectations in the waiting period (Boivin & Takefman, 1995). Early findings suggest that women may attempt to suppress the negative emotions of the treatment and exert efforts to manage it (Callan & Hennessey, 1989). There is no need to restrain the treatment-related distress when outcomes of ART are released. Thus, women might answer the emotion reactions to ART treatment without restraint in the retrospective inventory. The findings of the research contribute to the understanding of the distress that women experienced during an ART cycle fluctuated across the stages and certain stages are more distressful than others in the treatment cycle (Boivin & Takefman, 1995).

Based on the knowledge of women's experience of distress when undergoing ART, researchers have attempted to identify the individuals who are at highest risk of developing psychological symptoms. Facchinetti and associates

(1997) used a prospective design to explore vulnerability to psychological distress in women receiving ART. Forty-nine women were recruited and received psychological distress tests, pregnancy tests, and blood pressure and heart rate measures the day of oocyte retrieval. Compared to those who discovered they were pregnant, women in the failure group showed higher blood pressure and heart rates that implied cardiovascular vulnerability to distress. In addition, women who failed to achieve pregnancy showed a higher state anxiety score than did those who succeeded. The authors suggested that distress vulnerability is associated with the outcomes of ART treatments (Facchinetti et al., 1997). Fertility team members need to pay special attention to women who have unsuccessful experience with ART procedures and provide better support to them; a better support system might increase the possibility of the success with their future treatments.

Through the development of intracytoplasmic sperm injection (ICSI), men who have been diagnosed with azoospermia are able to have their own children (von Zerssen, et al., 1996). In some fertility clinics, ICSI has been performed with other ART methods to increase the chance of achieving pregnancy. Researchers are interested in the psychological response of infertile couples receiving both ART and ICSI. Beutel et al. (1999) conducted a retrospective study on 281 couples to investigate the relationship between treatment-related

distress and depression for couples undergoing IVF and/or ICSI. Not surprisingly, women reported higher treatment-related distress than did their male partners. No significant differences in distress and psychological symptoms were observed between the groups of IVF and ICSI. However, men who received ICSI demonstrated more strain with regard to the problem of infertility, thus preventing them from providing sufficient support to their spouses during the treatment process. Lack of support from their spouses may increase women's susceptibility to emotional distress (Beutel et al., 1999). Studies of the association between social support and distress may help to identify distress susceptibility in women undergoing ART.

In summary, assisted reproductive technology (ART) is usually considered the last-resort infertility treatment to assist couples who have failed to conceive using non-invasive treatment (McShane, 1997). Couples who decide to undergo ART hope to fulfill the dream of becoming parents. However, ART is very expensive, and before treatments actually begin, the couple must undergo many examinations that increase the financial burden. These invasive examinations as well as the effects of the actual treatment are a source of tremendous distress with which the women undergoing ART must attempt to cope (Domar, 1997, Leiblum, 1997). Many women undergoing ART experience disappointment, anger and sadness. Women who resort to ART are often not prepared to deal with these

high levels of physical and emotional distress. Therefore a study of how women can successfully cope with ART may provide nursing professionals fundamental knowledge needed to design effective interventions to assist ART recipients (Garner, 1983; Wells, 1983).

### Conceptualization of Coping

Humans exert energy to cope with distressful experiences. Psychologists consider coping as “the individual’s intention to face up, or at least to make some attack on difficulty” (Popplestons & McPherson, 1988, p.75). Coping is not only a response to serious events, but also is a response to ordinary life events. Coping is an evolving skill developed from infancy through adulthood. Murphy (1962) studied the effect of both common life events as well as natural disasters on individuals’ coping abilities. She concluded that irregularities from external environmental pressures and internal personal problems affect coping demands.

In reviewing research related to coping, three models are used to explain the concept of coping (Concise Encyclopedia of Psychology, 1987). The first model focuses on animal studies and is called drive-reinforcement learning theory (Lazarus & Folkman, 1984). In this theory, coping is seen as acts to escape and avoid unpleasant environmental situations, to achieve control of the condition, and to regain balance or equilibrium in adverse situations. Outcomes of coping are related to the predictability and controllability of distressful situations.

The second model to explain coping is the psychoanalytic ego conceptual approach used in psychology (Lazarus & Folkman, 1984). Coping is considered as a matured level of ego process. Coping is developed throughout the life span and is considered a basic survival skill required for functioning in the social environment.

There are drawbacks in interpretation of the first and second models of coping. Examination of these models reveals that coping is associated with successful adaptation outcomes. In both the animal model and the psychoanalytic ego psychology model, coping focuses on positive, mature or advanced skills in adapting to situations. These perspectives may omit some common and lower levels of coping.

The third model considers coping as a cognitive appraisal process (Lazarus & Folkman, 1984). This model emphasizes that how an individual appraises a distressful event determines his or her coping strategies. Coping is defined as the efforts to manage demands that tax or exceed the person's resources (Lazarus & Folkman, 1984). Coping can stimulate an individual to change thoughts or behaviors. Personal and environmental factors influence an individual's cognitive appraisals of stressors and affect the outcome of coping.

Since the late 1970's there has been much interest in studying of how personal factors such as cognitive appraisal affect coping with distress. Coping is

a multi-dimensioned concept composed of different subconcepts. Researchers have proposed different categorization of coping responses. Traditional approaches to coping are conceptualized as either dispositional approaches or contextual approaches (Holahan et al., 1996). In the dispositional approach, coping is viewed as a personality trait that is stable across different situations (Bond, Gardner, Christian & Sigel, 1983; Vaillant, 1977). The contextual approach assumes that coping is a dynamic interaction between the person and the environment (Lazarus & Folkman, 1984). Lazarus and Folkman's transactional model of coping is the most frequently used contextual approach to coping (Lazarus & Folkman, 1984).

Coping elicits a broad spectrum of responses. Lazarus and Folkman (1984) conceptualized two forms of coping efforts: problem-focused coping and emotion-focused coping. How an individual copes with distress affects his or her overall adaptation. However, there are no consistent conceptual distinctions in the coping efforts. Though both forms of coping use cognitive and behavioral ways to manage distressful encounters, approach coping is directed at problem solving or active attempts to manage the stressor while avoidant coping is directed at avoiding confrontation with the stressor to reduce emotions aroused by the stressor (Dolbier & Steinhardt, 2001; Moos, Brennan, Fondacaro, & Moos, 1990; Roth & Cohen, 1986).



### Studies Related to Women's Coping with ART

Successful coping with the distress of ART is necessary for women during treatment (Stanton, 1991). As the use of ART has become more frequent, women's reactions to the invasive nature of ART procedures have become a research issue of interest (Crowe, 1990). Stewart and Glazer (1986) interviewed three women to understand their expectations and coping when receiving In-vitro Fertilization (IVF). In their findings, women reported experiences of physical discomfort and emotional distress while undergoing IVF, and described the nature of the support they received from their spouses and health professionals. Differences among the informants were also included in their findings. Results from this descriptive study present primary descriptions of the phenomenon of women's experience of distress and coping with ART. More complex studies need to be done to assist clinicians to understand the relationships among personal and environmental factors and coping. To identify the presence of relationships, correlational study designs are necessary (Burns & Grove, 1997).

Some women who participate in a four-week long cycle of ART report that their psychological distress changes with different stages of an ART cycle (Berg & Wilson, 1991; Slade et al., 1997). These findings support Lazarus and Folkman's (1984) conceptualization of coping. The woman experiencing emotional changes make efforts to change their behaviors or thoughts to manage

the altering situations they perceive as exceeding their resources (Bringinghenti et al., 1997).

Infertile women using emotion-focused coping may experience a decrease in psychological distress (McQueeney et al., 1997). Adopting emotion-focused strategies may not alter the infertile woman's objective situation, but her perception of the distressful encounter may be modified (McQueeney et al., 1997; Stanton, 1991). In addition, some emotion-focused coping strategies, such as seeking emotional support, meditating, and doing exercises to distract one's focus from distressful transactions, serve to change a person's attitude about the experience without changing the meaning of an encounter directly (Lazarus & Folkman, 1984). By using emotion-focused coping strategies, infertile women may gradually begin to manage infertility-related emotional distress (Callan & Hennessey, 1989).

Stanton et al. (1991) tested the theory of stress and coping by investigating cognitive appraisal of 54 couples confronting infertility. They hypothesized that a couple, when confronted with the diagnosis of infertility, might have differing cognitive appraisal interpretations of the event and that these differing interpretations might influence the partner. Hypotheses were based on the concept of primary and secondary appraisal as described by Lazarus and Folkman (1984). The researchers hypothesized that infertile couples would perceive their

experience of infertility as both threatening and challenging (Stanton et al., 1991). The second hypothesis, exploring the process of secondary appraisal, was that infertile couples would perceive little control over their infertility.

Findings from this study confirmed both hypotheses that infertile couples perceived infertility as a threat and challenge in their life and also believed that they had little control over the diagnostic and treatment course of action (Stanton, et al., 1991). The more threatening the couples perceived the infertility to be, the less control they felt and therefore had less ability to cope with the situation. The results support the theory of stress and coping statements that distress is a subjective experience, and that personal and environmental factors such as the presence of an intimate relationship can influence the appraisal of infertility as a distressful situation (Stanton et al., 1991).

McQueeney et al. (1997) examined the effects of emotion-focused and problem-focused coping strategies on reducing distress in 29 women receiving infertility treatments. Subjects were assigned to one of three groups: emotion-focused coping group (n=10); problem-focused coping group (n=10); and a control group (n=9). After receiving training programs about the two coping strategies, the subjects' infertility-related distress scores decreased when compared to scores in the control group (McQueeney et al., 1997).

Subjects in the emotion-focused training group displayed more control of negative emotions after infertility treatments (McQueeney, et al., 1997). Adopting emotion-focused coping strategies may not alter the infertile woman's objective situation, but her perception of the distressful encounter may be modified. These results support a major tenet of Lazarus's theory that an individual takes action to manage distressful environment situations and to regulate the emotional distress to stress (Lazarus & Folkman, 1984).

A small sample size (n=26) limits generalization of results from this study. However, findings of this study demonstrated that some women manage the distress of infertility by gaining emotional equilibrium with the use of emotion-focused coping strategies. The results suggest that emotion-focused coping may be considered beneficial to women undergoing distressful medical procedures such as in vitro fertilization (McQueeney, et al., 1997). Further research is needed to document the efficacy of simultaneous emotion-focused and problem-focused coping in the infertile women's experience of coping with the stress of ART treatments.

A number of studies of women's coping with the distress of ART have been completed using cross-sectional designs (Berg & Wilson, 1991; Lukse & Vacc, 1999; Slade, Raval, Buck & Lieberman, 1992). Employing a cross-

sectional design is appropriate when there is evidence or logical reasoning to hypothesize that one event preceded another event (Polit & Hungler, 1999).

Slade and associates (1992) conducted a cross-sectional study to examine the effect of time on women's coping with infertility after three years of medical treatments. The results indicated that women experience long-term distress with continued infertility. Yet, causality of time and infertile women's experience of the distress of infertility treatment cannot be established through a cross-sectional design (Henry, Moffitt, Caspi, Langley, & Silva, 1994).

Berg and Wilson (1991) studied couples' distress of infertility treatment across different stages of ART. Using a cross-sectional study, they collected data from subjects with a history of infertility treatments at one, two, and three or more years. The authors posited that levels of emotional distress are related to the years of infertility treatments. However, a cross-sectional design does not provide information to determine group differences between women who continue infertility treatments and those who terminate ART (Berg & Wilson, 1991).

Demyttenaere and associates (1991) employed biochemical parameters to evaluate the effectiveness of various coping strategies used during the process of in-vitro fertilization and embryo transfer. In this study, endocrinological levels and scores on coping measures were assessed in 40 women on two occasions: before and after the oocyte retrieval or embryo transfer. Prolactin and cortisol

levels comprised the index of effectiveness of coping with the distress of IVF treatment. Higher prolactin and cortisol concentrations indicated higher distress as a result of ineffective coping (Demyttenaere, et al., 1991). After embryo transfer, prolactin and cortisol levels were lower because the anticipatory distress diminished. Women who employed emotion-focused coping strategies such as avoidance demonstrated higher prolactin concentration. This study provided significant information for using endocrinological evidence to understand the relationship of coping strategies and the distress responses in women receiving ART treatments.

In another study, Demyttenaere et al. (1998) evaluated the effects of coping on the treatment outcomes of women undergoing IVF cycles. Ninety-eight women who were prepared to receive IVF were recruited to participate in a prospective study. These women received psychometric tests at their first IVF treatment visit. The researchers compared levels of negative emotions and symptoms of depression in pregnant and nonpregnant groups. Women in the nonpregnant group experienced elevated depressive symptoms. Women who expressed more negative emotions early in the study experienced a lower pregnancy rate following IVF treatment. The investigators suggested that the expression of negative emotions may predict the outcome of IVF. However, any

causal relationship between negative emotions and pregnancy rates following ART treatments needs to be further examined.

A more detailed assessment of the process of psychological adjustment of women during ART can be obtained through the use of a longitudinal design (Slade et al., 1997). Longitudinal study designs are more appropriate to identify individual differences among infertile women and to detect varying distress levels that women experience (Dunkel-Schetter & Stanton, 1991). Lukse and Vacc (1999) conducted a pre- and post-test study to explore the relationship of coping and depression for women undergoing ART. Data were collected three times; before, during and after treatment to understand the changes of coping in various stages of ART treatments. In their study, neither demographic nor infertility history was related to the incidence of symptoms of depression. Emotion-focused coping strategies, such as self-talk and sleep, were commonly used by the women. No significant relationship was identified between the symptoms of depression and the frequency of using emotion-focused coping strategies. Women in the study reported a higher incidence of depressive symptoms, indicating that women undergoing ART encounter tremendous emotional distress that may tax or exceed their resources to manage it. Information on coping strategies may need to be provided to couples who first enter ART to assist them in coping with the treatment.

### Marital Adjustment

Infertility inevitably affects and possibly changes marital relationships. In certain situations, infertility may affect marital relations negatively. For couples married for long time, documenting fertility problems may disrupt their marital functioning and produce marital distress. Dunkel-Schetter and Stanton (1991) described women reporting anger, hostility, and lack of understanding. Being infertile without the prospect of achieving a pregnancy may lead to the fear of separation or divorce. Infertile women expressed difficulty in disclosing personal feelings to their spouses about the decision to receive aggressive, invasive treatment for infertility.

While it is clear that infertility can negatively affect a marriage, it may also have positive effects on a marriage (Woollette, 1985). The issue of infertility, as a threat to the mutual relationship, may result in a more intimate and supportive relationships uniting the couple to overcome the problem of infertility.

In a survey study of marital relationships of couples undergoing infertility treatment, Link and Darling (1986) studied the relationship of marital adjustment and the distress of ART treatments. Women in this study were divided into two groups, forty-three couples in one group and seventeen women-only in another group. Results suggested that the women-only group reported considerably higher emotional distress, lower marital satisfaction and lower life satisfaction



than the coupled group. The researchers found that women with a lower life satisfaction and marital adjustment experienced higher depression during the treatment (Link & Darling, 1986). Fertility team members need to assess the impact of ART on women's marital adjustment and the availability of support.

Much research indicates that marital relationships change in the process of ART treatments (Dennerstein & Morse, 1985; Raval et al., 1987; Wallace, 1985). Anticipatory distress of ART treatment affects the marital relationship. One of the reasons is that women expressed fear that a failed attempt may cause their husbands to devalue them in their role of women (Wallace, 1985). Nevertheless, contrary research findings were reported that couples' marital relationship improved when women started to receive ART (Raval et al., 1987). A possible explanation is that the procedures of ART are emotionally demanding and therefore may lead to changes of the marital relationship. The ART procedures may contribute to an increase in intimate relations between couples as the result in decreasing marital problems. Changes of marital relationships may be associated with the application of the coping strategies.

Inconsistent findings may be the result of inappropriate methodological shortcoming (Benazon, Wright, & Sabourin, 1992). A lack of examination of the marital adjustment in a treatment cycle and satisfactory sample size has yielded contradictory results. Women's marital adjustment may change in the process of

ART treatments. On the other hand, other researchers have found that couples' relationships may remain generally stable (Benazon et al., 1992; Slade et al., 1997). Longitudinal prospective study designs are useful in examining the changes of marital relationships within a treatment cycle.

Cook and associates conducted research to understand the changes of infertile couples' emotional functioning in the context of marital relationships during the process of ART (Cook, Parsons, Mason, & Golombok, 1989). Thirty-one women and eighteen of their partners enrolling in IVF programs were recruited into the study. In this study, women undergoing ART showed high levels of anxiety and elevated levels of depression. The findings of the study are consistent with those of previous studies, all showing that the nature of ART is distressful. The researchers suggested that depression is more likely to be present in women after learning of a failed ART attempt. In considering the effect of ART on couples' marital relationships, no evidence of a significant increase of marital problems was obtained in their study. The authors reported that the marital relationships were stable for those couples enduring long-term distress of undergoing ART treatments (Cook et al., 1989).

Over half of the women receiving ART cannot successfully become pregnant. Failing to conceive through ART may produce profound effects on women's psychological functions and marital adjustment. Slade and associates

studied 47 couples who had never had a child (primary infertility) when they first visited the infertility clinic. The researchers postulated that couples feel grief about remaining childless after receiving treatment for more than 2 years. Three years later, the authors contacted the same couples to examine the time effect on psychological functions and marital adjustment between the fertile and infertile groups, as well as the relationship of coping and marital adjustment (Slade et al., 1992). A total of 25 couples completed all the data. The researchers found that when no resolution of infertility was found, women in the study simply accepted that they would remain infertile. The researchers found that levels of anxiety, depression and hostility did not diminish significantly in either infertile or fertile groups after a 3-year follow-up. Similar findings were obtained from the assessment of marital adjustment. The authors suggest that marital relationships in women who continue to be infertile do not deteriorate (Slade et al., 1992). Women who failed to achieve a pregnancy employed coping strategies to adjust to marital distress. The more women used self-blame coping strategies, the lower the marital adjustment they experienced. However, the small number of subjects and the interaction of history and maturation may threaten the validity of the study results, and generalization of the study is limited (Slade et al., 1992).

Changes of marital relationships across ART cycles have been examined (Slade et al., 1997). Because the average success rate of ART is approximately

20-30 percent per ART cycle, many women need to undergo repeated treatments in order to achieve a pregnancy. The researchers reported that the first time ART receiver demonstrated the greatest level of distress (Lindheim, et al., 1995; Slade et al., 1997). Psychological distress reduced when women became habituated to the distress of an ART cycle. However, little is known about changes in marital relationships across multiple treatment cycles.

Slade, Ravel, Buck and Lieberman (1997) conducted a prospective study to evaluate changes in women's emotions and marital functioning in various ART cycles and at a 6-month follow-up after the last cycle. A total of 144 couples agreed to participate in the study. A battery of standardized psychological tests was used to measure emotional functioning. Marital relationships were assessed by the Dyadic Adjustment Scale (DAS) (Spanier, 1976) with higher DAS scores indicating better marital adjustment. Although women who failed to conceive demonstrated lower levels of marital adjustment at the beginning of IVF treatments, they did not report significant marital difficulties six months after discontinuing the treatment (Slade et al., 1997). The findings of this study suggest that couples developed strong commitment in terms of accepting the fact of remaining childless. This study presents no information regarding changes in marital adjustment within an ART cycle, thus the stability of marital relationships across stages of ART treatment cannot be inferred (Slade et al., 1997).

Many couples conceive a child after receiving many ART cycles. Previous unsuccessful experiences of ART treatment may affect the women's psychological and marital adjustment in the final ART attempt. Leiblum et al. (1998) conducted a retrospective study to explore women's levels of distress and marital function after terminating ART treatments over years. Women were separated into a successful IVF group (n=41), an unsuccessful IVF group who adopted (n=16), and a group who remained childless group (n=8). A battery of standardized questionnaires was administered to measure the relationships among marital adjustment, levels of general distress and the outcomes of ART. Findings of the study revealed that there were no significant differences between ART outcomes and marital adjustment among the three groups.

In summary, women experience marital distress when undergoing ART, but no evidence of significant changes was obtained in several prospective longitudinal studies. These studies suggest that, in general, marital adjustment seems to remain stable in women receiving ART treatment.

### Social Support

Literature has revealed that social support exerts a main and/or buffering effect on the way that an individual copes with distressful events (Abbey et al., 1991; Kapan, Cassel & Gore, 1977). In a meta-analysis of the effects of social support, Cohen and Wills (1985) documented evidence supporting two models of

social support. They determined that the main effect of social support is beneficial to all receivers regardless of the level of distress the individual is experiencing. However, they found that the buffering effect of social support was only evident in persons who were experiencing very high levels of distress (Cohen & Willis, 1985).

The benefit of social support in reducing distress experienced by infertile women has been recognized. Abbey et al. (1991) investigated both the main effect and the buffering effect of social support on infertile couples' quality of marital life. Results following regression analysis suggested that there was only a main effect of social support on the couples' quality of marital life. A stress-buffering effect of social support was not documented in their research. The authors suggested that the buffering effect of social support is most beneficial to those individuals experiencing high levels of distress (Abbey et al., 1991). Receiving ART treatment is considered a highly distressful process. Additional research is needed to explore the effect of social support on reducing and/or buffering the distress of women undergoing ART.

When a couple goes through an ART cycle, the intracouple relationship will be affected (Abbey et al., 1991). Even though interpersonal conflict occurs between infertile women and their husbands, overall women were satisfied with the support provided by their spouses (Abbey et al., 1991). A longitudinal study

design is needed to examine the effects of social support on women's marital adjustment in the process of ART treatment.

The effects of social support on couples undergoing in vitro fertilization (IVF) and embryo transfer (ET) have been examined in a longitudinal study by Freeman, Boxer, Rickels, Tureck, and Mastroianni (1985). Two hundred couples starting IVF and ET were recruited into the study. Counseling was given to all couples before the treatment initiates and during the process of ART as requested by the couples. The counselor evaluated the couple's emotional status, experience of infertility and expectation of ART treatment. The study found that couples receiving counseling demonstrated lower emotional distress during the treatment process; thus these researchers concluded that social support contributes to a decrease in the distress of ART.

The extent of perceived social support, the relationship of psychological distress, and couples' need for support while undergoing IVF were examined by Laffont and Edelman (1994). The authors further explored couples' preferred support across the stages of IVF treatment. One hundred seventeen women and 101 men participated in the study and received social support questionnaires developed by the investigators. Both men and women perceived their partners as the most likely source of support. Physicians and nurses were ranked second and third respectively. The findings echo the conclusions in several studies that

couples' marital relationship remains stable in the process of ART. Sixty-three percent of the women reported discussing ART concerns with physicians, while 41% discussed their concerns with nurses. The findings highlight the importance of nursing professionals to facilitate ART recipients' passage through the treatment cycle (Laffont & Edelmann, 1994).

Boivin and Takefman (1996) studied associations between emotional distress and social relationships in women undergoing ART. Twenty women in a primary ART attempt were recruited. Data were collected prospectively from one menstrual cycle before the initiation of ART treatment and continued to the end of the ART cycle in order to understand changes in emotional distress and social support across stages of ART. The findings of the study suggested that women experience the highest levels of distress and the lowest number of social contacts during the oocyte retrieval-transfer stage. Emotional distress elevated as the treatment advanced. However, women in the study did not receive sufficient support to cope with the distress at the stage of oocyte retrieval. Replication of the study using a large sample is necessary to evaluate the effect of social support on the emotional distress of ART (Boivin & Takefman, 1996).

#### Individual Characteristics

There are no consistent findings of individual characteristics relevant to women's coping with the distress of ART. Women's age, number of ART cycles,



previous pregnancies and cost of ART have been identified as predictors of emotional distress in women receiving ART. The fertility rate declines as women's age increases. The older the women are, the less probable it is that they can conceive a child. Thus, they may experience higher distress than younger women (Abbey, Halman, & Andrews, 1992; Morrow et al., 1995).

With regard to the effect of previous ART cycles, the initial and latest ART cycle are generally considered to be the most distressful (Demyttenaere, et al., 1998). Fear of what might happen increases the distress of first-time receivers of ART (Abbey, et al., 1992; Demyttenaere, et al., 1998). Women who decide to undergo the last ART cycle consider this as the final opportunity to conceive their biological children, and therefore many experienced especially high distress levels. Couples receiving ART who had a previous conception reported higher levels of distress after unsuccessful treatments. Couples with a child at home also demonstrated higher levels of depression after unsuccessful ART (Demyttenaere, et al., 1998).

The cost of ART is expensive and not affordable for every infertile couple (Blank, 1990). The expenditure per ART cycle in Taiwan is comparatively high-priced. It is estimated that the cost of one cycle of in-vitro fertilization (IVF) and embryo transfer (ET) is at least 80,000 to 100,000 Taiwanese dollars (in 2,300 to 3,000 US\$) (Liu, 1999). The cost of surgical correction of fallopian tubes and the

endometrium may not be included in the expense of the ART procedures (Liu, 1999). If infertile couples have to undergo ICSI and embryo transfer, the cost is greatly increased. A couple may spend 120, 000 Taiwanese dollars (in 3,500 US\$) on a single ISCI and ET attempt (Liu, 1999). The total cost varies because of the various underlying situations that each woman has (Su et al., 1995).

The demand for and provision of ART treatments are not proportionate. The average pregnancy rate per ART cycle is approximately 30% in Taiwan (Taiwan Department of Health, 2000). The expensive procedures coupled with the low success rate of ART make the cost of ART seem to outweigh the benefits (de Melo-Martin, 1998). The only ART related treatment covered by the national health insurance in Taiwan is ovulation stimulant medication (Liu, 1999). There is no assistance for other ART procedures and this restricts ART use to only those couples who can privately afford the service. Cost of receiving ART may be a stressor for those who require repeated treatments.

No consistent evidence supports maternal age, previous ART tries, the number of children and the cost of ART to be the determinants of women's coping with the stress of ART. This dissertation research reassessed factors add distress and coping variables to explore their relative contributions to the infertility related distress and the severity of psychological symptoms in Taiwanese women undergoing ART.

### Summary

Women have historically been the central figure in infertility treatment, regardless of the causes of the infertility. Evidence from the literature indicates that women experience higher levels of emotional distress and increased needs to cope with the stress of ART treatment. Because of the different demands within an ART cycle, women may experience differing levels of emotional distress. Two stages of the ART cycle are identified as the most distressful periods of time in women: the oocyte retrieval/ embryo transfer stage and the waiting period for pregnancy test results. Examination of women's distress at these two occasions may facilitate a better understanding of the coping strategies that Taiwanese women use to manage ART-related distress.

Much research has recognized that ART shapes couples' marital relationships. The intimate relationship, marital coherence and satisfaction of the women may be disturbed by the invasive treatment procedures involved in ART. Women undergoing ART face many adjustments in their marital relationship. Therefore, the relationship of emotional distress and marital adjustment needs to be studied in this population of infertile women. Social support may decrease or buffer the effect of distressful events and contribute to women's coping with ART. To help partners cope with the distress of ART, support from spouses and/or health care providers throughout the cycle providers may be crucial. The

effect of distress and social support during ART in Taiwanese women was explored in this dissertation research.

### **Chapter III: Methodology**

#### **Research Design**

The selection of the most appropriate methodological design for any research is based on the purpose of the study (Phillips, 1986). The purpose of this study was to examine changes in and relative contributions of problem-focused and emotion-focused coping, marital adjustment, and social support on Taiwanese women's experience of distress during three stages of an assisted reproductive technology cycle. Accordingly, a prospective longitudinal study design was used to explain and predict the relationships among emotional distress, coping strategies, marital adjustment, and social support for women receiving ART in Taiwan.

The prospective longitudinal approach was chosen as the most appropriate in explaining Taiwanese women's coping with the distress of ART because ART treatment is a multi-stage process, women may encounter different levels of distress when going through an ART cycle, and because psychological adjustment is highly individualistic. The prospective longitudinal study design should allow evaluation of varying distress levels that women experience across stages of the ART cycle (Dunkel-Schetter & Stanton, 1991). There are, however, disadvantages in conducting a longitudinal study, including the cost of data

collection and maintenance over time, and subject attrition. Small sample size is also common in most longitudinal research (Polit & Hungler, 1999).

### Population and Sample

The population to be studied was women who received ART treatments in Taiwan. A total of 6,573 ART cycles were performed at 63 accredited reproductive technology institutes in Taiwan in 1998 (Taiwan Department of Health, 2000). Because of the lack of feasibility of getting a probability sample, a non-probability, purposeful convenience sample of women enrolling in ART clinics in Southern Taiwan was invited to participate in this study. While convenience sampling is economically and logistically feasible, convenience sampling does limit generalization of study results to the population of women receiving ART in Taiwan (Polit & Hungler, 1999). Infertile women who met the following criteria were included in this study: (1) 20-50 years old and (2) married. Women under 20 are rarely considered to have the problem of infertility. In order to control possible effects of extraneous variables on the evaluation of psychological distress, only married women were included in this study (Creswell, 1994).

A sample size of seventy-four participants was determined by using a computerized statistical power analysis (nQuery 4.0) for multiple regressions with 4 predictors with a significance level of .05, a power of 80%, and moderate effect

size of .15 for multiple regression analysis. Approximately 15-20% of ART receivers would be unable to undergo oocyte retrieval due to oocyte growth failure and other reasons. Therefore, a total of eighty-nine women were recruited to participate in this study to cover the attrition of the subjects.

Subjects were recruited from one ART clinic to achieve more research control of variations in ART medical procedures (Polit & Hungler, 1999). Women who elected to receive ART treatment and were approved for this therapy were recruited from the Tainan United Birth-Promoting Experts (TUBE) Fertility Clinic that performs approximately 300 ART cycles annually in southern Taiwan. The TUBE Fertility Clinic serves infertile couples from all over Taiwan. Written permission to conduct the study at the TUBE Fertility Clinic was granted by the Director of the Clinic.

After the approval of the study was obtained from the School of Nursing Departmental Review Committee (DRC) and the University of Texas at Austin Institutional Review Board (IRB) to conduct the study, a nurse research assistant who is a member of the TUBE Fertility Clinic staff, identified women who enrolled in ART programs and meet the selection criteria. Women entering ART treatment programs are ambulatory and have no need to be hospitalized during the process of the treatment. Because of the nature of privacy in ART treatment, there was no personal contact from the Principal Investigator (PI) before women

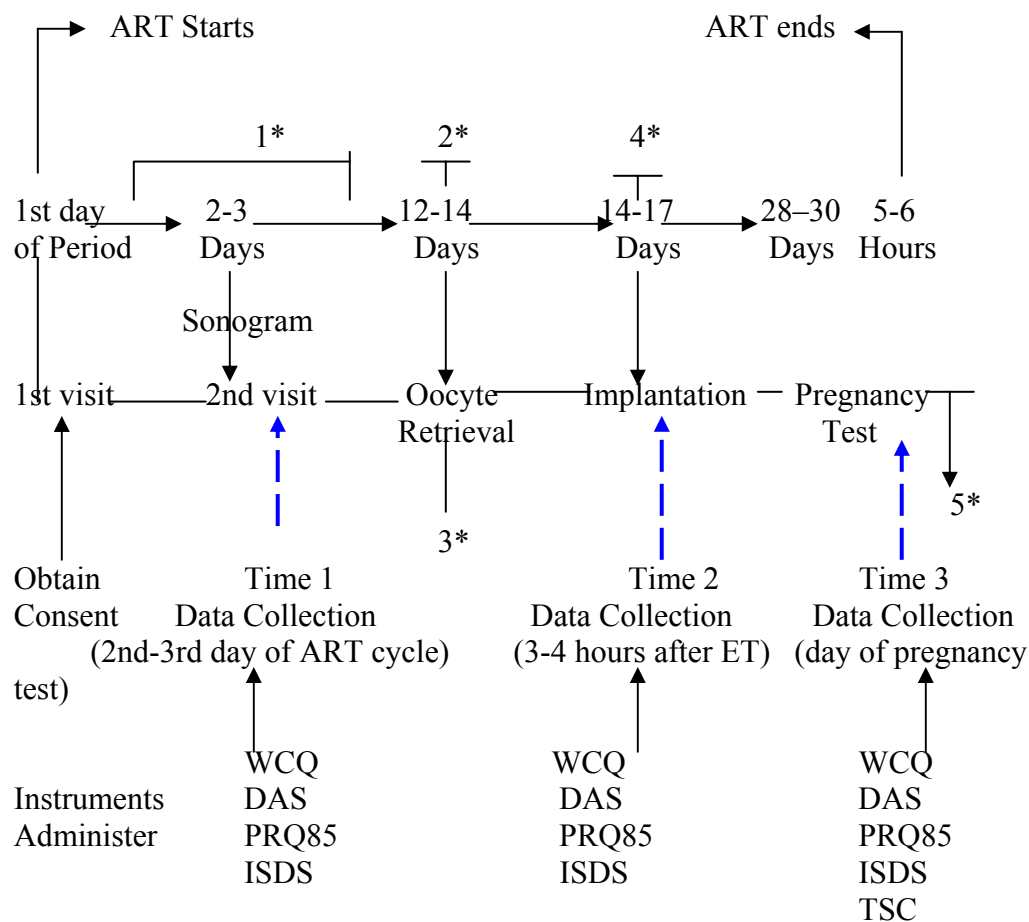
consented to be contacted by her. The staff nurse research assistant working in the TUBE Fertility Clinic approached women who met study criteria and distributed an informational packet describing the study. The packet included an information letter (Appendices A & J) and a self-addressed, postage paid postcard to be mailed to the PI if the woman was willing to be contacted by the PI. Therefore the staff nurse research assistant did not know which women agreed and which declined study participation.

#### Procedures for Data Collection

Data were collected after the approval of the School of Nursing DRC, the University of Texas at Austin IRB, and the approval of the Director of the TUBE Clinic. A complete ART cycle lasts about 4 weeks. The cycle period extends from the ovulation stimulation stage, through the oocyte retrieval/ embryo transfer stage, to the pregnancy test stage (Carcio, 1998). Previous research suggests that two stages of the ART cycle are considered especially distressful: the oocyte retrieval/embryo transfer stage and the 2-week duration of waiting before the pregnancy can be confirmed. Eligible women enrolled in ART programs at the TUBE Fertility Clinic were contacted three times in the treatment cycle. Three times of data collection were 2-3 days after ART start, 3-4 hours after embryo transfer, and the day of pregnancy test but before the results were given. A diagram depicting an ART cycle and times of data collection is in Figure 3.



Women who were interested in participating in the study mailed the PI a postcard giving permission and a telephone number for the PI to contact her. The principal investigator called the women who agreed to be contacted and met with them at their first ultrasound examination. The PI answered the women's questions and obtained the written consent during the scheduled clinic visit.



**Figure 3** Instruments and data collection schedule across ART cycle

Note.

- WCQ-Ways of Coping Questionnaire      DAS-Dyadic Adjustment Scale  
 PRQ85-Personal Resource Questionnaire 85      TSC-Taita Symptom Checklist  
 ISDS-Infertility-Specific Distress Scale  
 ET-Embryo Transfer  
 1\*: Women receiving hMG or FSH injection daily  
 2\*: Injection of large dose of hCG to trigger final oocyte maturation (diameter of the follicle<2cm)  
 3\*: Oocyte Retrieval performed under vaginal ultrasound within 34-36 hours after large dose of hCG injection  
 4\*: Three to four embryos are transferred to the uterus  
 5\* Receives pregnancy test results

At the first data collection each woman who chose to participate received a questionnaire packet containing the Personal Information Form (Appendices C & L) and a battery of Chinese versions of instruments including the Ways of Coping questionnaire (WCQ) (Folkman & Lazarus, 1988) (Appendices F & O), the Dyadic Adjustment scale (DAS) (Spanier, 1976)(Appendices G & P), the Personal Resource Questionnaire 85 part II (PRQ85 II) (Weinert, 1987) (Appendices H & Q), and the Infertility-Specific Distress Scale (ISDS) (Stanton, 1991)(Appendices D & M). Women filled out the questionnaires at the convenience during a scheduled clinic visit. The questionnaire took approximately 30-35 minutes to complete at each data collection time. After the first time of data collection, the investigator called subjects to schedule the next data collection date.

The second data collection was conducted at three to four hours after embryo implantation; the investigator administered Chinese versions of the WCQ, the DAS, the PRQ85, and the ISDS. The women spent 20-25 minutes completing questionnaires.

The final data collection occurred when participants came to the clinic to provide a blood sample to confirm or disconfirm pregnancy. Five to six hours after their blood was drawn, the women received a phone call regarding the results of the pregnancy test. Thus, the third time of data collection was

conducted when the women visited the clinic for pregnancy testing, but before the results were given. The WCQ, the DAS, the PRQ85, the ISDS, and the Taita Symptom Checklist (TSC) (Tsai, Ling, Wen, Soong, & Chen, 1979) (Appendices E & N) were administered to the subjects. The purpose of administering the WOC, the PRQ85, the DAS, and the ISDS at three times was to identify changes of coping, marital adjustment, social support, and infertility-specific distress over times.

### Instruments

Five instruments and a personal information form were used to measure the variables of infertility-specific distress, severity of psychological symptoms, coping, social support and marital adjustment. Permissions to use these instruments were obtained from the authors of the instruments prior to conducting the study. All instruments except the Infertility-Specific Distress Scale (ISDS) have been translated into Chinese and tested in Chinese-speaking samples. Permissions to use Chinese versions of the instruments have been obtained from the authors of the instruments. The ISDS was translated into Chinese and a pilot study to determine the reliability and validity was conducted with 30 Taiwanese women similar to the dissertation study sample. All 30 women had experienced a period of infertility and were asked to respond to the ISDS as though they were still infertile.

### Personal Information Form

The Personal Information Form developed by the investigator was used to obtain women's personal information related to ART treatments. Information gathered from the form includes: age, educational level, infertility history including previous ART medical history and prior pregnancies.

### Infertility-Specific Distress Scale.

The English version of the Infertility-Specific Distress Scale (ISDS) was first developed by Stanton (1991) to measure an infertile individual's emotions toward a fertility problem. The author based her scale on the definition of distress provided by Lazarus and Folkman's transactional theory of stress (1984), and conceptualized the measure of infertility distress. An individual's evaluation of the importance of being a biological mother determines her perception of infertility as a distress or not a distress. If motherhood is an important goal in her life and she cannot naturally bear children, then infertility may arouse distress (Stanton, 1991).

The Infertility-Specific Distress Scale is a self-report instrument consisting of two sections of questions regarding the infertile woman's life satisfaction and the positive and negative emotions experienced by infertile individuals (Stanton, 1991). Item response categories for the first section of the scale include a 7-point scale ranging from "1" for "strongly disagree" to "7" for "strongly agree." The

second section of the scale is composed of 20 positive and negative emotion adjectives regarding feelings relevant to fertility problems. The part regarding feelings about the fertility problem is a 5-point Likert-type scale ranging from 1 for “not at all like I have felt” to 5 for “exactly like I have felt.” The internal consistency of the Infertility-Specific Distress Scale was 0.94 in infertile women, and content validity was supported (Stanton, 1991).

The evidence of reliability and validity of the scale has been provided and considered satisfactory. The Infertility-Specific Distress Scale (Stanton, 1991) was therefore considered effective in studying infertile women’s distress. However, research has been conducted only in middle-class, white populations in the U. S. There existed no information about the results of using the scale in other ethnic populations; therefore, it was risky to assume that the Infertility-Specific Distress Scale was appropriate for use with Taiwanese women without considering cultural differences. When considering adoption of the Infertility-Specific Distress Scale in assessing Taiwanese women’s distress during ART, the appropriateness of the instrument needed to be examined. The Infertility-Specific Distress scale was translated into Chinese and assessed for validity as described in the testing validity section.

### Taita Symptom Checklist

The Taita Symptom Checklist (TSC) is a 44-item self-report, psychological symptom checklist written in Chinese. TSC has been widely used to measure the severity of psychological symptoms in Taiwanese populations (Tsai, Lin, Wen, Soong, Chen, 1979). Items of the TSC were generated by selection from the symptom checklist-90 (Derogatis, 1977), a parent version of the Brief Symptom Checklist (BSI). The authors conducted further item analysis procedures using item response charts to assess each item's discriminant power (Watts, Strickland, & Lenz, 1991). Chi-square values were calculated between a psychiatric patient group and a non-psychiatric patient group. Items with a significant chi-square value were retained to form the final version of the TSC (Tsai et al., 1979). The resulting TSC rates on a 5-point scale, ranging from "0" (none) to "4" (extremely). Respondents were asked to estimate their degrees of distress using the symptom checklist. The total time needed to fill out the inventory is less than 10 minutes. The TSC is convenient for use in clinical settings in which less time is available to answer a long inventory.

The TSC includes seven dimensions that are somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, and phobia. The TSC is the average value of items in the seven dimensions. Evidence of the reliability and validity of the TSC has been supported by authors and other

researchers (Lee, et al, 1991; Tsai et al., 1979). Internal consistency has been reported in a study of 102 Taiwanese women receiving assisted reproductive technology (Lee et al., 1991). Cronbach's alpha ranged from .70 to .90 in this sample, indicating satisfactory reliability. Test-retest reliability was also tested on the same sample in 2-week intervals. Coefficients in seven dimensions range from .72 to .81, showing satisfactory consistency of the instrument across time. The correlations of the TSC (psychoneurosis symptom checklist) and the PNSC have been tested using a sample of 100 normal persons to examine convergent validity of the TSC (Tsai et al., 1979). The PNSC is an instrument that measures the same trait as the TSC does. Correlation between the TSC and the PNSC was .92, implying high agreement between the two instruments. Empirical evidence of the predictive validity of the TSC has been tested in a variety of study areas including psychopathology and infertility research (Lee et al., 1995; Tsai, et al., 1979). Findings of these studies support the validity of the TSC. Overall, the TSC provides a brief but complete measure of severity of psychological symptoms.

#### Ways of Coping Questionnaire

Lazarus and Folkman developed the Ways of Coping Checklist (WCC) to measure problem-focused and emotion-focused coping based on their theory of stress and coping and clinical observations (Lazarus and Folkman, 1984). The



Ways of Coping Questionnaire (WCQ) is modified from the Ways of Coping Checklist (WCC). The WCC is a 68-item self-administered checklist with a yes-no response format. The checklist measures the coping strategies provoked by an individual's distress experienced in the past week (Lazarus & Folkman, 1985). Forty-four items of the WCC measure problem-focused coping and 24 items measure emotion-focused coping. Cronbach alpha coefficients for the WCC range from 0.70 to 0.81, indicating moderate correlation among items. The intercorrelations between the emotion-focused and problem-focused coping scales range from 0.04 to 0.45. This suggests that these two subscales measure two separate but related concepts.

Based on results obtained from early WCC testing, Folkman and Lazarus modified the instrument (Folkman & Lazarus, 1985). Items in the WCC were reworded, deleted or added to form the Ways of Coping Questionnaire (WCQ) (Folkman & Lazarus, 1988). As a result, the WCQ is now composed of 66 items with a 4-point Likert-response format (0 means "does not apply and/or not used; "3" means "used a great deal") (Lazarus & Folkman, 1988). The Likert-response provides more information than a dichotomous response scale in understanding individuals' coping patterns.

Reliability and validity of the WCQ have been measured by Lazarus, Folkman and other researchers (Folkman & Lazarus, 1985; Folkman, Lazarus,

Gruen, & Delongis, 1986). In Lazarus and Folkman's own work, a total of 324 observations were obtained to provide the evidence of reliability of the WCQ. The Cronbach alpha coefficients of the WCQ ranged from .56 to .85 (Folkman & Lazarus, 1985). The internal consistency of the WCQ is considered satisfactorily in line with the conceptualization of coping provided by Lazarus and Folkman. The intercorrelations among the eight scales range from 0.13 to 0.64, indicating the disparity between these scales (Folkman & Lazarus, 1988).

Theoretical analysis, empirical data and clinical judgments were used to determine the domains of the WCQ (Folkman & Lazarus, 1988). Factor analyses were conducted to assess the construct validity of the WCQ (Folkman & Lazarus, 1988). The stability of the factor structure for two coping scales has been explained in numerous studies (Folkman et al., 1986). Results of the studies have cross-validated the factor structure of the WCQ (Folkman, Lazarus, Dunkel-Schetter, Delongis & Gruen, 1986). The WCQ has also been translated into Chinese and administered to a Taiwanese population (Wei, 1997). Results of the study show satisfactory validity of WCQ in measuring different ethnic populations (Wei, 1997).

Factor analysis of the WCQ has generated eight components of coping (Folkman & Lazarus, 1986). They are confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance,

planful problem solving, and positive reappraisal. Confrontive coping measures aggressive efforts to change the situation. Seeking social support indicates behavioral efforts to seek informational support, tangible support, and emotional support. Planful problem solving describes purposeful behavioral efforts to change the stressors, connected with an analytic approach to solving the problem. Positive reappraisal refers to cognitive and behavioral efforts to create positive meaning by focusing on personal growth. Distancing refers to cognitive efforts to separate one and to minimize the significance of the situation. Self-controlling indicates cognitive efforts to regulate one's feelings and actions. Accepting responsibility acknowledges one's own role in the problem with a concomitant theme of trying to put things right. Escape-avoidance refers to wishful thinking and behavioral efforts to escape or avoid the problem.

Folkman suggested that the numbers of coping dimensions should be 2-8 (Folkman, 1992). For the purpose of the study, relationships among these eight subscales were examined to obtain the combinations of emotion-focused coping and problem-focused coping scales.

#### Dyadic Adjustment Scale

The Dyadic Adjustment Scale (DAS) was utilized to measure women's perception of the quality and stability of their marriages (Spanier, 1976). The DAS is a 32-item scale made up of four subscales: consensus seeking, affective

expression, satisfaction, and cohesion. The consensus seeking subscale consists of 13 items indicating couples' agreement on the matters of importance to their marital relationship. Four items of the DAS are in regard to couples' satisfaction with their partners' expression of affection. The Satisfaction subscale is a 10-item scale measuring couples' satisfaction with present marital relationships and commitment to continuation. The Cohesion subscale is a five-item scale assessing couples' enjoyment of activities together.

The DAS is a self-report questionnaire consisting of a 6-point scale. The total score of the DAS ranges from 0 to 175, the higher the score the greater the marital adjustment. Internal consistency reliability was reported as satisfactory with a Cronbach alpha ranging from .80 to .82 for the Satisfaction subscale, .75 to .78 for the Cohesion subscale, .64 to .77 for the Consensus subscale and .63 to .85 for the Affective Expression subscale. Evidence of content validity and construct validity has been reported (Spanier, 1976). Construct validity has been supported using the Locke-Wallace Marital Adjustment Scale. Correlation between the DAS and the Locke-Wallace was .86. Factor analysis performed to further support the construct validity identified three components (dyadic satisfaction, dyadic consensus, and dyadic cohesion) (Spanier, 1976). The DAS has been translated into Chinese and employed to measure Chinese couples' marital

relationships (Shek, 1995). The Chinese version of the DAS was used in this dissertation study.

#### Personal Resource Questionnaire 85

The Personal Resource Questionnaire (PRQ85 Part II) was used to measure perceived social support of women receiving ART (Weinert & Brandt, 1987). The PRQ was first developed in 1981, with slight modifications made after testing of the instrument (Brandt & Weinert, 1981). The revised version of the PRQ is called the PRQ82. Refinement of the PRQ continued through clinical testing of the instrument (Weinert, 1984). The recent version of the PRQ is the PRQ85. The PRQ consists of two parts. Part I is composed of 10 life situations in which one is expected to need assistance. Obtained support, source of support and satisfaction with the support are included in part I. The PRQ85 part II consists of 25 self-report items which measures respondents' perceived support. The PRQ85 Part II is a 7-point Likert scale questionnaire. The scale ranges from strongly agree (7) to strongly disagree (1). The total scores of the PRQ85 part II range from 25 to 175 with the high scores indicating high levels of perceived social support (Weinert, 1987). The PRQ85 part II assesses five dimensions of social support: intimacy, social integration, nurturance, worth, and assistance. The total time to complete the PRQ is about 15 minutes.

Satisfactory reliability of the PRQ part II has been reported in the studies of samples of 149 spouses of multiple sclerosis patients, 77 low-income mothers, 120 elderly university alumni, and 94 first-time expectant parents (Weinert, 1984). The alpha coefficients range from .88 to .90. Weinert and Brandt (1987) examine validity of the PRQ85 II in a sample of 100 adults ranging from 30 to 37 years old. Cronbach alpha of the scale ranging from .91 to .93 indicates satisfactory internal consistency. Stability of the scale is supported by the test-retest reliability coefficient of .72 (Weinert, 1987). Construct validity was reported and supported by examination of convergent and discriminant validity (Weinert & Tilden, 1990).

The Chinese version of the PRQ85 II was adopted from Wang (1998) who translated the scale and used a sample of elderly women in Taiwan. Internal consistency, stability, content and construct validity were reported and acceptable in Wang's study (1998). The investigator used this Chinese PRQ85 II to measure women's perceived social support.

#### Translation of Instruments

Because there was no Chinese version of the Infertility-Specific Distress Scale (ISDS) available, initial work to translate the instrument into Chinese and examine the reliability and validity of the scale was carried out.

### Methods.

Written permission to use and translate the ISDS was obtained from the author. The back-translation procedure was used for translating the instrument to examine cross-cultural adaptation (Brislin, 1986). The aim of back-translation is to acquire the “equivalent meaning of items” in the original and translated forms (Varricchio, 1997). The scale was first translated from English to Chinese by the researcher and a Taiwanese nursing doctoral student, both of whom are bilingual. A Taiwanese doctoral student whose major is Teaching English as a Second Language then translated the questions from the Chinese ISDS back to the English form. A fourth person, who is the medical director of a fertility clinic in Taiwan and has been working for thirteen years with infertile populations, evaluated the English and Chinese versions of the instrument. A fifth person who speaks only English also verified the English back-translation.

The evaluation and modification of the two language versions of the scales continued until equivalence was achieved. The original and translated versions went through the process of decentering, which allows the modification of two versions in order to reach the clear equivalence of the concepts contained in two scales (Brislin, 1970). Adequacy of the translation was considered. The grammatical forms uncommon to the translated scale were not retained so as to avoid confusing the subjects (Varricchio, 1997).

### Testing reliability and validity of the ISDS.

Prior to the dissertation study, a pilot study with 30 participants was conducted to examine the translation, reliability, and validity of the Chinese version of the Infertility-Specific Distress Scale (Stanton, 1991). Test-retest reliability of the Chinese version of the ISDS was obtained by mailing the ISDS to participants at two times. Construct validity of the ISDS was measured by having participants complete the Chinese State Anxiety Inventory (SAI) (Jong & Long, 1984) (Appendix R) and the ISDS at the second data collection time. Then the data from the ISDS and the SAI were correlated to examine construct validity. Because the pilot sample was not undergoing reproductive technologies, it was expected that their scores on the SAI should be within the normal range. Previous studies (Gallinelli, et al., 2001; Smeenk, et al., 2001) have consistently shown elevated SAI scores in women undergoing reproductive technologies.

The whole population of women undergoing assisted reproductive technologies (ART) annually is small in Taiwan. According to the report from the Department of Health in Taiwan, a total of 6,573 ART cycles were performed at 63 accredited reproductive technology institutes in Taiwan in 1998 (Taiwan Department of Health, 2000). Approximately 100-300 ART cycles were performed yearly in an ART institute in Taiwan. Moreover, the actual number of women receiving ART is less than the number of cycles performed because a



woman may receive more than one ART cycle in a year. Because of the difficulty of accessing a sufficient number of potential participants for the dissertation study, women undergoing ART were not recruited to the pilot study.

A snowball sampling technique was used to recruit a sample of 30 Taiwanese women to participate in a pilot test of reliability and validity of the Chinese version of the Infertility-Specific-Distress Scale (ISDS) (Stanton, 1991). The inclusion criteria were: Taiwanese women who were at the age of 20-50, married, a member of a group of friends known to the investigator. All participants had marital status and age ranges similar to those of the anticipated dissertation study sample. Of the forty-three women who agreed to participate in the pilot study, 30 (75%) completed the questionnaires two times. Ten women did not return the second questionnaire. The final sample in the pilot study ranged in age from 23 to 45 years ( $M=32.00$ ,  $SD=4.95$ ). Eleven subjects (36.67%) had a high school diploma, 4 (30.00%) held a bachelor or a higher degree. Of the subjects, 72.50% had no children and 26.67% had one or two children. In general, the sample in the pilot study was similar to that in the main study.

Data were collected after the approval of the School of Nursing Departmental Review Committee and the University of Texas at Austin Institutional of Review Board. Women who were friends of the investigator, and those who were interested in participating in the pilot study received a cover

letter, the Chinese version of the ISDS, and a self addressed stamped envelope. Participants were asked to complete the ISDS questionnaire two times. The first questionnaire packet was mailed to potential participants within 3 days after the investigator had been told that the potential participant was interested in the pilot study. The second data collection time was two weeks after the first mail-out of the ISDS. The Chinese ISDS and the Chinese State Anxiety Inventory (SAI) were included in the second mail packet. The purpose of including the SAI was to examine the congruent validity. Participants filled out the questionnaires at their convenience and mailed them back to the investigator using the enclosed self-addressed, stamped envelope in each packet. It took approximately 5-10 minutes for the participants to complete each questionnaire. The correlation coefficient of the scores of the Chinese ISDS at time 1 and time 2 was .70,  $p < .01$ . The results of the correlation indicated satisfactory test-retest reliability.

#### Internal Consistency

The internal consistency was measured by using the alpha coefficient. As Burns and Grove (1993) suggested that an alpha coefficient greater than .70 is an acceptable internal consistency. The alpha coefficient of the ISDS was .80 indicating a satisfactory internal consistency of the scale.

### Validity of the ISDS

Validity of the ISDS was assessed by testing content validity and congruent validity. Content validity refers to whether a measurement really measures the concept under study. A panel of experts: two infertility nurses, an MD infertility specialist, and two women who had undergone ART assessed content validity of the Chinese ISDS. The five experts were instructed to assess the relevance of each item on a four-point scale, ranging from 1 (not relevant) to 4 (very relevant) (Waltz, Strickland, & Lenz, 1991). Then, the content validity index (CVI) was calculated (Lynn, 1986). The content experts evaluated the relevance of the items in terms of the concept constructed. A CVI of the total scale above .7 is necessary to demonstrate evidence of content validity. The CVI was 92.7, giving the evidence of content validity. In addition, data obtained from the Chinese State Anxiety Inventory were correlated with the data of the Chinese ISDS to examine the construct validity of the translated version of the ISDS. The correlation coefficient of the scores of the ISDS and the SAI was .74,  $p < .01$ . The strength of intercorrelation gives evidence of congruent validity, suggesting that the validity of ISDS was satisfactory.

### Data Analysis

Descriptive statistical analyses, analysis of variances, and multiple regression analyses were used to answer the research questions. The research

questions were: (1) Are there patterns of relationships among the Ways of Coping items across times 1, 2, and 3? (2) Do coping scores change over times 1, 2, and 3? (3) Do infertility-specific distress scores change over times 1, 2, and 3? (4) Does social support function as a moderator or mediator effect on infertility-specific distress and global severity of psychological symptoms? (5) Do the major variables change over time? (6) What are the relative contributions of emotion-focused coping, problem-focused coping, marital adjustment and social support on Taiwanese women's experience of the distress of receiving assisted reproductive technology?

Data collected in three time periods were entered through and analyzed by the Statistical Package for the Social Sciences (SPSS) for Windows version 10.0. The investigator examined the accuracy of the data file through inspecting means, standard deviations, ranges, missing data, and outliers. Descriptive statistics were used to describe the characteristics of subjects, infertility-specific distress, severity of psychological symptoms, coping, marital adjustment, and social support.

Repeated measures analyses were applied to answer research questions 2, 3, and 5 regarding the changes of two forms of coping scores, infertility-specific distress scores, marital adjustment scores, and social support scores over times 1,

2, and 3. Zero-order correlations were used to answer research question 1 to examine the patterns of relationships among the WCQ items across time.

A series of hierarchical multiple regression analyses were applied to answer research question 4. Hierarchical regression analyses were conducted to examine the influences of social support on two emotion outcomes: infertility-specific distress and global severity of psychological symptoms. Two forms of coping scores and social support as predictor variables were entered sequentially first. Then, a new product term signifying the interaction of coping and social support was introduced in addition to the previous predictor variables to examine moderating effects of social support.

Research question six was analyzed broadly using a series of multiple regression equations. The first set of equations used the emotion-focused coping scores, problem-focused coping scores, the Dyadic Adjustment scores, the PRQ85 scores in times 1, 2, and 3 to predict infertility-specific distress. The second set of equations used these same predictors to predict severity of psychological symptoms.

#### Protection of Human Subjects

Data were collected after the approval of the School of Nursing Departmental Review Committee, and the University of Texas at Austin Institutional Review Board. Written approval was also obtained from the TUBE

Fertility Clinic in southern Taiwan to protect subjects' rights. Because of the nature of privacy in ART treatment, there was no personal contact from the investigator before women consented to be contacted by her. The staff nurse research assistant working in the research setting approached women who met study criteria and distributed an informational packet describing the study. The packet included an addressed, postage paid postcard to be mailed to the investigator if the woman is willing to be contacted by the investigator.

Taiwanese women who indicated willingness to participate in this study met the investigator at their first clinic visit. The investigator answered women's questions regarding the study. Women who agreed to participate in the study then signed a consent form (Appendices B & K) and received a general information form. After written consent was obtained, women received a research package distributed by the investigator at each data collection time. A Personal Information Form was given at first data collection time. Women filled out the questionnaires at their convenience at the clinic. The questionnaires took approximately 20-25 minutes to complete at each data collection time. Coded questionnaires were used to maintain privacy; no personal identifying information was on the forms that women complete so that they could not be identified in any way. Women might decline to answer any questions that they felt uncomfortable or concerned about answering. Any information obtained in this study remained

confidential and would be disclosed only with the participant's permission. The consent form, all the questionnaires, and a list linking the code numbers with participants' names were kept locked in a cabinet for privacy so that only the investigator and her dissertation committee had access to the information. All information obtained in connection with the study was reported only as group data; there was no way for answers to be associated with a particular individual.

Participation in this study was voluntary. Deciding not to participate in this study did not affect women's rights to receive health care in the research site. Women could change their minds at any time and withdraw from the study without any consequences to them. The information women provided help the health care providers better understand women's distress when undergoing ART and provide nursing interventions to meet their needs. General reports of the findings of this study were mailed to the participants after the study was completed.

## **Chapter IV: Results**

This chapter presents the results of the study. The purpose of the study was to examine changes in and relative contributions of problem-focused coping, emotion-focused coping, marital adjustment, and social support on Taiwanese women's experience of distress during three stages of an assisted reproductive technology (ART) cycle. The characteristics of the participants, the levels of problem-focused coping, emotion-focused coping, marital adjustment, and social support across the stages of the ART cycle are presented. In addition, the results of between-subjects and within-subjects effects and regression analyses are also provided in this chapter.

### Characteristics of the Participants

The characteristics of the sample in the study are shown in Table 1. Potential participants were married Taiwanese women from the age 20-50 undergoing ART at an accredited reproductive technology center in southern Taiwan. Of the 89 eligible women who consented to participate in the study, 74 completed three sets of questionnaires. Fifteen subjects (17%) were excluded from statistical analysis because of incomplete data. Therefore, the final sample consisted of 74 infertile Taiwanese women who received ART treatments. These women ranged in age from 25 to 45, with an average age of 32.61 years ( $SD=3.9$ ). Their education level ranged from junior high school to graduate school with the



majority of women (74.3%) having a high school or two-year college diploma. The average months that women in the sample had been trying to conceive a child were 50.6 months (SD=33.55), ranging from 0 to 13 years. However, the median time was 48 months. Of the 74, 59 (79.7%) had no children, 9 (12.2%) had one child, and 6 (8.1%) had two children before undergoing ART treatments. With respect to the diagnosed cause of infertility, 39 (52.7%) carried female-factor diagnoses, and 14 (18.72%) carried male-factor diagnoses. Forty-nine (66.2%) women had prior experience in receiving in-vitro fertilization (IVF). Of the women who had undergone previous IVF treatments, 44 (89.7%) had at least one or more IVF cycles. When study participants were asked whether their current IVF cycle would be their last treatment, 17 (22.97%) answered “yes.” Their reasons for terminating ART cycles included ART expenses; distress associated with ART treatments, inconvenience, and plans to adopt a child.

Table 1  
Characteristics of the Participants

Characteristics	<u>n</u>	<u>%</u>
Age		
Mean±SD	32.61±3.90	
Range	25-45	
25-29	15	20.50
30-34	37	50.70
35-39	18	24.70
40-44	2	2.70
45-49	1	1.40
Education Level		
Junior high school	4	5.40
High school	36	48.70
Junior college	19	25.70
University	12	16.20
Graduate school	3	4.10
Religion		
Buddhism	25	33.80
Taoism	31	41.90
Christian	3	4.10
Catholics	1	1.40
Others	2	2.70
None	12	16.20
Months Trying to Conceive		
Mode: 24		
Median: 48		
Mean±SD	50.60±33.55	
Range	0-156	

Table 1

## Characteristics of the Participants (continued)

Characteristics	<u>n</u>	<u>%</u>
No. of Biological Children		
None	59	79.70
One	9	12.20
Two	6	8.10
Diagnoses of Infertility (72/74 cases)		
Female factors	39	52.70
Male factors	14	18.92
Both	12	16.22
Unknown	7	9.46
No. of ART Treatments		
0	25	33.80
1	28	37.80
2	13	17.60
3 and above	8	11.80
Last ART Cycle		
Yes	17	22.97
No	57	77.03
Reasons for terminating ART cycles (of 17 subjects)		
ART expenses	16	94.11
Pressure of ART	12	70.59
Inconvenience	3	17.65
Adoption	3	17.65

### Description of Major Study Variables

Descriptive statistics for the scores of the Ways of Coping Questionnaire (WCQ), the Dyadic Adjustment Scale (DAS), the Personal Resources Questionnaire 85 (PRQ), the Infertility-Specific Distress Scale (ISDS), and the Taita Symptom Checklist (TSC) are depicted in Table 2. The WCQ, the DAS, and the ISDS were measured three times in the ART cycle; the TSC was measured only once. Frequency statistics, means and standard deviations are provided to describe the major study variables. Internal consistency reliability for all instruments and subscales were adequate, and ranged from .68-.90.

#### Infertility-Specific Distress Scale (ISDS)

Higher scores indicate high infertility-specific distress that women felt. In general, participants' scores on ISDS across the three data collection times fell below the midpoint on distress items. The range of scores is given in Table 2. Of the 74 women in the sample, approximately 11 percent reported moderate to high infertility-specific distress in time 1. In time 2, about 6.8% and in time 3, 9.5% of the sample experienced moderate to high infertility-specific distress. The relationships among the three ISDS scores, women's age, education levels, religion, months of trying to conceive, numbers of biological children, factor in diagnosis of infertility, and numbers of previous ART treatments were examined.

No statistically significant correlations were found among ISDS scores and these demographic variables.

#### Emotion-focused (EFC) and Problem-focused Coping (PFC) Scales

The WCQ consists of two subscales, emotion-focused coping (EFC) and problem-focused coping (PFC) strategies. Each subscale of the WCQ is a 4-point Likert-response format ranging from 0 (does not apply and/or not used) to 3 (used a great deal). Higher scores indicate more frequent use of either emotion-focused or problem-focused coping strategies. Paired-samples *t* tests were used to examine the differences between the EFC and PFC scores in times 1, 2, and 3. There were statistically significant differences between EFC and PFC in time 1 ( $t_{73}=12.86$ ,  $p<.01$ ), time 2 ( $t_{73}=11.64$ ,  $p<.01$ ), and time 3 ( $t_{73}=10.57$ ,  $p<.01$ ) indicating that women in the sample used emotion-focused coping more frequently than they used problem-focused coping at times 1, 2, and 3. The relationships of EFC scores, PFC scores and demographic variables were examined. No statistically significant correlations were found among EFC and PFC scores and the demographic variables.

#### Dyadic Adjustment Scale (DAS)

The DAS raw scores were transformed to T-scores as required by the scoring procedure. The DAS scores at all three times were above the norm score of 45, which is the average dyadic adjustment (Spanier, 1989). The relationships

of DAS scores and demographic variables were examined. No statistically significant relationships were found among DAS scores and the demographic variables.

#### Personal Resource Questionnaire 85 (PRQ)

High scores on the PRQ indicate high levels of perceived social support. The mean scores of the PRQ were the highest in time 1 (ovulation stimulation) ( $\underline{M}$ =128.16) and the lowest in time 3 (waiting for the results of the pregnancy test) ( $\underline{M}$ =124.42) but no significant difference was found between time 1 and time 2. The relationships of PRQ scores in the three data collection times and demographic variables were examined. No statistically significant relationships were found among PRQ scores and the demographic variables.

#### Taita Symptom Checklist (TSC)

TSC scores were measured only at time 3 with higher TSC scores indicating more severe psychological symptoms. The average TSC score was .62 (SD=.42) indicating that women experienced mild levels of psychological symptoms while waiting for the results of the pregnancy test. Relationships among TSC scores and demographic variables were examined and no statistically significant correlations were found.

Table 2

Means and Standard Deviations of the Major Study Variables across the Times of the ART Cycle

	Time 1 (Ovulation Stimulation)	Time 2 (Embryo Transfer)	Time 3 (Waiting for Pregnancy Test)
	Mean±SD	Mean±SD	Mean±SD
ISDS	2.02±.71	1.99±.64	2.04±.70
Range	(1.00-4.40)	(1.10-3.70)	(1.10-4.10)
WCQ/PFC <sup>a</sup>	6.86±2.60	7.29±2.49	7.17±2.68
Range	(.75-14.50)	(1.50-12.75)	(.250-15.25)
WCQ/EFC <sup>b</sup>	11.28±3.03	11.60±3.32	11.15±3.32
Range	(3.25-18.00)	(2.25-18.50)	(2.25-17.50)
DAS	45.88±9.52	45.26±9.94	46.68±8.31
Range	(20-66)	(20-66)	(22-66)
PRQ	128.16±17.61	126.74±16.13	124.42±18.33
Range	(77-165)	(88-165)	(83-165)
TSC			.62±.42
Range			(.00-2.14)

a WCQ/PFC: Problem-focused Coping Subscale of the WCQ

b WCQ/EFC: Emotion-focused Coping Subscale of the WCQ

### Analysis of the Data

#### Research Question One: Are there patterns of relationships among the Ways of Coping Questionnaire items across times 1, 2, and 3?

Zero-order correlations were performed to examine patterns of relationships among the Ways of Coping items across times 1, 2, and 3. Authors of the WCQ deleted 16 items from the final computation of the subscales, resulting in a total of 50 items in the scale. Scoring of the WCQ involves computing the eight subscales: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance, positive reappraisal, and planful problem solving. According to the assumptions of the study, the eight subscales were then combined to yield scores for emotion-focused and problem-focused coping. The means and standard deviations of the WCQ subscales are listed in Table 3 and the relationships of the eight subscales of the WCQ in times 1, 2, and 3 are presented in Tables 4, 5, and 6.

According to the results of the zero-order correlations among the subscales of the WCQ, the theoretical interrelationships among the eight scales were organized. Confrontive coping scores were not highly correlated with distancing scores. Self-controlling scores were not highly correlated with distancing scores. Seeking Social Support scores were not highly correlated with confrontive coping or self-controlling scores. Accepting Responsibility scores were not highly



correlated with distancing and seeking social support scores. Escape-Avoidance scores were not highly correlated with distancing or seeking social support scores. Planful problem solving scores were not correlated with confrontive coping, self-controlling, accepting responsibility, or escape-avoidance scores. Positive reappraisal scores were not highly correlated with confrontive coping, self-controlling, accepting responsibility, or escape-avoidance scores.

The emotion-focused and problem-focused coping scales were composed of four subscales each, based on the findings of the correlation matrix of the eight subscales. Thus, the emotion-focused coping scale was composed of four subscales, confrontive coping, self-controlling, accepting responsibility, and escape-avoidance. The problem-focused coping scale was composed of distancing, seeking social support, planful problem-solving, and positive reappraisal subscales.

Table 3

Means and Standard Deviations of Coping Scales across Three Times of the ART  
Cycle (N=74)

Scale	Time 1	Time 2	Time 3
	Mean±SD	Mean±SD	Mean±SD
Confrontive Coping	5.40±3.29	5.70±3.68	5.51±3.74
Range	(.00-18.33)	(.00-19.00)	(.00-19.00)
Distancing	7.82±2.57	7.97±3.11	7.64±2.99
Range	(2.00-13.00)	(1.00-15.00)	(1.00-15.00)
Self-controlling	5.05±2.12	5.14±2.28	5.17±2.57
Range	(.33-10.33)	(.00-12.00)	(.00-10.00)
Seeking social support	8.83±3.80	9.09±4.12	8.85±4.21
Range	(.00-16.00)	(.00-18.00)	(.00-18.00)
Accepting Responsibility	7.73±3.54	7.74±3.73	7.64±3.93
Range	(1.00-15.67)	(1.00-16.00)	(1.00-17.00)
Escape-Avoidance	10.26±3.29	10.58±3.53	10.32±3.53
Range	(4.33-17.33)	(3.00-18.00)	(4.00-18.00)
Planful Problem Solving	14.63±4.30	14.74±4.58	14.31±4.77
Range	(1.33-22.33)	(1.00-23.00)	(1.00-24.00)
Positive Reappraisal	14.08±4.18	14.59±4.53	13.78±4.73
Range	(2.00-21.67)	(2.00-24.00)	(1.00-24.00)

Table 4

## Intercorrelations of Coping Scales at Time 1 of the ART Cycle

Scale	1	2	3	4	5	6	7	8
1.Confrontive Coping	—	-.03	.45	.58	.67	.42	.38	.24
2.Distanceing		—	.21	.16	.03	.29	.35	.38
3. Self-controlling			—	.25	.47	.41	.30	.24
4.Seeking Social Support				—	.30	.22	.56	.66
5. Accepting Responsibility					—	.60	.41	.21
6.Escape-Avoidance						—	.47	.20
7.Planful Problem Solving							—	.73
8. Positive Reappraisal								—

Table 5

## Intercorrelations of Coping Scales at Time 2 of the ART Cycle

	1	2	3	4	5	6	7	8
1.Confrontive Coping	—	.06	.29	.51	.57	.39	.32	.17
2.Distanceing		—	.26	.34	.09	.37	.45	.47
3. Self-controlling			—	.24	.30	.35	.26	.26
4 Seeking social support				—	.20	.23	.52	.64
5. Accepting Responsibility					—	.48	.37	.15
6.Escape-Avoidance						—	.43	.22
7.Planful problem solving							—	.72
8. Positive Reappraisal								—

Table 6

## Intercorrelations of Coping Scales at Time 3 of the ART Cycle

	1	2	3	4	5	6	7	8
1.Confrontive Coping	—	.06	.41	.51	.66	.36	.39	.20
2.Distanceing		—	.18	.20	.03	.31	.37	.39
3. Self-controlling			—	.16	.36	.31	.15	.05
4.Seeking social support				—	.29	.19	.57	.61
5. Accepting Responsibility					—	.58	.44	.20
6.Escape-Avoidance						—	.55	.23
7.Planful problem solving							—	.67
8. Positive Reappraisal								—

### Research Question Two: Do coping scores change over times 1, 2, and 3?

Assumptions of sphericity of major study variables were tested because of use of repeated measures ANOVA. Mauchly's test was conducted to examine the assumption of homogeneity of variance among predictors at the significance level of .05. The sphericity of the PFC, DAS, and PRQ were violated ( $p < .05$ ) indicating differences in variance in PFC, DAS, and PRQ scores. Since the F ratio is positively biased if the sphericity assumption is not met, an adjustment of the degrees of freedom by using either the Greenhouse-Geiser (more conservative) or Huynh-Feldt (more liberal) epsilon ( $\epsilon$ ) values (Field, 2000) is necessary. In this study, the Greenhouse-Geiser epsilon was used to determine whether it would be necessary to adjust the degrees of freedom. At the significance level of .05, the test of sphericity was assumed and no adjustment of degrees of freedom was necessary. Test statistics of the homogeneity of variance of the ISDS and EFC scores were greater than .05, so the assumption of sphericity was met.

Analysis of variance with repeated measures was conducted to examine changes in emotion-focused coping (EFC) and problem-focused coping (PFC) scores over times 1, 2, and 3. At the significance level of .05, a statistically significant change in PFC scores occurred at each measurement time,  $F(2, 135) = 3.56$ ,  $p < .05$ , and a quadratic trend was observed. Results of repeated measures analyses are summarized in Table 7. These results revealed that women in this

sample employed problem-focused coping strategies most frequently at the time of embryo transfer. Tukey's post hoc comparisons showed that an increase of using problem-focused coping strategies from the time of ovulation stimulation (time 1) ( $\underline{M}$ =6.86) to that of embryo transfer (time 2) ( $\underline{M}$ =7.29) was statistically significant,  $t_{73}=2.38$ ,  $p<.05$ . No statistically significant changes were found from the embryo transfer time to the time of waiting for the results of the pregnancy test (time 3). Additionally there was no significant change in PFC scores from the time of ovulation stimulation to the time of waiting for the results of the pregnancy test.

Table 7

ANOVA Summary Table for the Changes of PFC Scores

Source	SS	df	MS	F
PFC	7.22	2	4.13	3.56*
Subjects	1320.11	73	18.08	
Residual	147.94	128	1.16	
Total	1475.27	203		

\* $P<.05$ . \*\* $p<.01$ .

In examining the changes in emotion-focused coping strategies (EFC) scores across the three data collection times, no statistically significant changes in EFC scores were found. Linear and quadratic trends were examined. The linear trend was not significant. However, a quadratic trend of EFC scores was observed,  $F(1, 73) = 4.10, p < .05$ . This trend analysis suggests that women in this sample employed emotion-focused coping most frequently at the time of embryo transfer.

Research Question Three: Do infertility-specific distress scores change over times 1, 2, and 3?

A repeated measures ANOVA was performed to evaluate changes in infertility-specific distress (ISDS) scores over times 1, 2, and 3. No statistically significant differences were found,  $F(2, 146) = .312, p = .733$ . Multiple comparisons were performed to examine the changes among three data collection times. There were no statistically significant changes of within-subjects contrasts in time 1 and time 2, time 2 and time 3, and time 1 and time 3. That is, women reported no statistically significant differences in their levels of infertility-specific distress over times 1, 2, and 3.



Research Question Four: Does social support moderate or mediate infertility-specific distress and global severity of psychological symptoms?

Cross product terms of PRQ by EFC (PRQEFC) and PRQ by PFC (PRQPFC) were computed and added to the regression equations to examine the function of social support as a moderator for infertility-specific distress. A series of hierarchical multiple regressions were performed to examine the  $R^2$  change when interactions were included as the product terms of social support and coping scores as moderators over times 1, 2, and 3. The results are displayed in Table 8. Results of the regression analyses indicated that the  $R^2$  increased significantly when product terms of PFC by PRQ were added into the regressions to predict ISDS. No statistically significant increases in  $R^2$  were found when multiplicative terms of EFC and PRQ were added. That is, social support moderated the effects of problem-focused coping on infertility-specific distress. The moderating effects of social support on coping and TSC scores were also examined by hierarchical multiple regressions. Results are similar to that of ISDS. When the products of PRQxEFC and PRQxPFC entered into the regressions,  $R^2$  changed increased significantly. In other words, social support moderates the effects of problem-focused and emotion-focused coping on the severity of psychological symptoms (measured by TSC). Results are presented in Table 9.

Table 8

Hierarchical Multiple Regressions of ISDS on PFC, PRQ, and Product of  
(PFCxPRQ)

Predictors	Cumulative $R^2$	$R^2$ Change	F Ratio $R^2$ Changed
Time 1			
PFC1 & EFC1	.247	.247	11.63**
PRQ1	.249	.002	.19
PRQ1xPFC1	.304	.055	5.42*
Time 2			
PFC2 & EFC2	.160	.160	6.78*
PRQ2	.165	.005	.38
PRQ2xPFC2	.228	.063	5.63*
Time 3			
PFC3 & EFC3	.073	.073	2.79
PRQ3	.100	.027	2.08
PRQ3xPFC3	.190	.090	7.67**

\* $p < .05$ , \*\* $p < .01$

Table 9

Hierarchical Multiple Regressions of TSC on PFC, PRQ, and Product of (PFCxPRQ)

Predictors	Cumulative R <sup>2</sup>	R <sup>2</sup> Change	F Ratio R <sub>2</sub> Changed
Time 3			
PFC3 & EFC3	.353	.353	19.35**
PRQ3	.364	.012	1.27
PRQ3xEFC3	.402	.038	4.34*
PRQ3xPFC3	.401	.036	4.18*

\*p<.05, \*\*p<.01

In addition, a series of regression analyses was performed to examine the mediating effects of social support on predicting ISDS and TSC scores. Results of the regression analyses showed that social support was not a mediator of the relationship between emotion-focused and problem-focused coping and ISDS and TSC outcomes.

#### Appraisal of Controllability

Data from the Appraisals of Controllability subscale of the WCQ were obtained. Appraisals were measured by a five-item scale developed by Wei (1997) from a Taiwanese sample to measure an individual's perception of ability to control the distressful situation. The appraisal scale is a 5-point Likert scale

(1=strongly disagree, 5=strongly agree). Internal consistency of the scale was tested, resulting in a satisfactory reliability ( $\alpha=.86$ ). Additionally, evidence of validity was examined by content experts. The relationships among the Appraisal subscale and the Emotion-focused and Problem-focused WCQ subscales were examined. Results are presented in Table 10.

Table 10

Means and Standard Deviations of Appraisal of Controllability over the Three Times

Appraisal	Mean	SD
Time 1	17.74	2.98
Time 2	17.38	2.84
Time 3	16.91	2.74

The mean appraisal scores change over the three data collection times,  $F(2, 146)=4.07, p<.05$ . A linear trend was observed,  $F(1, 73)=8.07, p<.01$ . Results indicate that women in the study perceived decreasing controllability as they proceeded through the stages of the ART cycle. The decrease of the appraisal of controllability was significant between the stage of ovulation (time 1) and waiting for the result of the pregnancy test (time 3).

Correlations of the scores of appraisals with emotion-focused coping at the three times of data collection were examined. Correlation of the scores of appraisal and emotion-focused coping at times 2 and 3 were statistically significant, time 2,  $r=.30$ ,  $p<.05$ ; time 3,  $r=.24$ ,  $p<.05$ ). There was a relationship between women's appraisal that they had less control and their decreased use of EFC at the time of embryo transfer and while awaiting pregnancy test results. Problem-focused coping at times 1, 2, and 3 were examined and no statistically significant relationships with appraisal of controllability were found. Use of problem-focused coping was not related to the level of control that women in the sample perceived at the times 1, 2, and 3.

#### Research Question Five: Do the major variables change over time?

The changes of two other major study variables, marital adjustment and social support, were examined by using repeated measures ANOVA. No statistically significant changes in marital adjustment scores over times 1, 2, and 3 were found,  $F(2, 125) = 2.03$ ,  $p=.142$ . Pairwise comparisons were conducted among the three data collection times in the ART cycle. Again, no significant changes were found between time 1 and time 2, time 2 and time 3, time 1 and time 3.

Additionally, changes of social support scores (PRQ scores) were assessed by using repeated measures ANOVA. A significant change in PRQ scores was observed across the ART cycle,  $F(2, 135) = 4.88, p < .05$ . Further analyses were conducted via post hoc comparisons. Women at the beginning of the cycle perceived the highest level of social support. While the difference in social support from time 1 to time 2 was not statistically significant, there was a significant decrease in PRQ scores from time 2 to time 3 ( $t_{73} = 2.19, p < .05$ ) which indicates that women in the sample perceived the least social support when they were waiting for the results of the pregnancy test. Additional significant change was found in the comparison of time 1 and time 3,  $t_{73} = 2.75 (p < .05)$ . Linear and quadratic trends were examined. A linear trend was observed,  $F(1, 73) = 7.59, p < .05$ . This trend analysis suggests that women in the sample perceived the most social support when they first entered the ART cycle and the least social support while they were waiting for the results of the pregnancy test. That is, levels of social support that women perceived decreased as they went through the ART cycle.

Research Question Six: What are the relative contributions of emotion-focused coping, problem-focused coping, marital adjustment, and social support on Taiwanese women's experiences of distress while receiving assisted reproductive technology?

Multiple regressions were conducted to find predictors that explain the most variance in the dependent variables (ISDS and TSC). Prior to performing the multiple regression analyses, the possibility of multicollinearity among predictors was examined. Two methods were used to diagnose the existence of the multicollinearity among predictors. Study findings showed that intercorrelations among the predictors ranged from .01 to .46, with variance inflation factor (VIF) not greater than 10 (ranged from 1.01-1.81) which indicate a low multicollinearity.

Because the influencing factors of Taiwanese infertile women's distress had not been identified, little empirical evidence was available to suggest the order of entering the predictors. Therefore, simultaneous multiple regression analyses were used to answer the Research Question Six. Four predictors, emotion-focused coping, problem-focused coping, marital adjustment, and social support and one dependent variable-infertility-specific distress were measured at three times of the ART cycle. Table 11 presents the first regression equation examining the relative contributions of emotion-focused (EFC1), problem-focused coping

(PFC1), marital adjustment (DAS1), and social support (PRQ1) on infertility-specific distress (ISDS1) measured in time 1. The regression equation predicting infertility-specific distress at time 1 is:  $ISDS1 = 1.857 - .039(EFC1) + .142(PFC1) - .006(DAS1) - .001(PRQ1)$

Table 11:

Summary of Simultaneous Regression Analysis for Variables in Time 1

Predicting the Time 1 Infertility-Specific Distress (N=74)

Variable	B	SE B	$\beta$	p
(Constant)	1.857	.629		.004
EFC1	-.039	.033	-.167	.237
PFC1	.142	.035	.519**	.000
DAS1	-.006	.009	-.081	.505
PRQ1	-.001	.006	-.125	.901

Note.  $R^2 = .254$ .

\* $p < .05$ , \*\* $p < .01$

At the significance level of .05, emotion-focused coping (EFC1), problem-focused coping (PFC1), social support (PRQ1), and marital adjustment (DAS1) explained 25.4% of the variance of infertility-specific distress (ISDS1),  $F(4, 69) = 5.86$ ,  $p < .01$  at time one. The contribution of PFC1 is 22%, which is



statistically significant at the .01 level. This is, 22% of variation in ISDS1 is accounted for by PFC1 after controlling other predictors. The contributions of DAS1, PRQ1, and EFC1 were not statistically significant given that PFC1 was in the model.

A second regression equation was conducted to examine the contributions of predictor variables (PFC2, EFC2, DAS2, and PRQ2) on ISDS scores at time two. The results are presented in Table 12. The multiple correlation coefficient was .416, indicating that 17.3 % of the variance of the ISDS2 can be accounted for by the linear combinations of EFC2, PFC2, DAS2, and PRQ2. The contribution of PFC2 is 8.0%, which is statistically significant at the .05 level. In other words, nearly 8% of variation in ISDS2 is accounted for by PFC2 after controlling other factors. That is, women who used more frequent problem-focused coping strategies experienced higher levels of infertility-specific distress. The contributions of DAS2, PRQ2, and EFC2 are not statistically significant given that PFC2 is in the model. The regression equation predicting infertility-specific distress at time 2 is as follows:

$$\text{ISDS2} = 2.405 - .052(\text{EFC2}) + .100(\text{PFC2}) - .006(\text{DAS2}) - .002(\text{PRQ2})$$

Table 12

Summary of Simultaneous Regression Analysis for Variables in Time 2  
Predicting the Time 2 Infertility-Specific Distress (N=74)

Variable	B	SE B	$\beta$	p
(Constant)	2.405	.669		.001
EFC2	-.052	.026	-.265	.053
PFC2	.100	.034	.387**	.004
DAS2	-.006	.007	-.094	.414
PRQ2	-.002	.006	-.053	.673

Note.  $R^2=.173$ .

\* $p<.05$ , \*\* $p<.01$

The third regression equation was conducted to examine the relative contributions of the PFC3, EFC3, DAS3, and PRQ3 on ISDS3. The results are presented in Table 13. The multiple correlation coefficient was .327, indicating that approximately 11 % of the variance of the ISDS3 was accounted for by the linear combinations of the EFC3, PFC3, DAS3, and PRQ3. There were no statistically significant predictors for the ISDS3 scores in the regression equation. A further regression analysis was conducted to examine the contributions of all the predictors in times 1, 2, and 3 for the ISDS3. The multiple correlation

coefficient was .25, indicating that approximately 6.3% of the variance of the ISDS3 was accounted for the predictors in times 1, 2, and 3. PRQ2 ( $b=-.273$ ,  $p<.05$ ) was the statistically significant predictor for the ISDS3 in the regression equation after controlling other predictors. Results of the analyses are presented in Table 14. That is, women perceiving less social support at the time of implantation (time 2) experienced a higher level of distress while waiting for the final results of their pregnancy tests.

Table 13

Summary of Simultaneous Regression Analysis for Variables in Time 3  
Predicting the Time 3 Infertility-Specific Distress (N=74)

Variable	B	SE B	$\beta$	P
(Constant)	3.008	.717		.000
EFC3	-.018	.031	-.085	.558
PFC3	.056	.036	.212	.121
DAS3	-.007	.010	-.089	.453
PRQ3	-.006	.005	-.169	.208

Note.  $R^2=.107$ .

\*  $p<.05$

Table 14

Multiple regressions of predictors in Times 1, 2, and 3 on ISDS3

Variable	B	SE B	$\beta$	P
(Constant)	3.557	.633		.000
PRQ2	-.019	.005	-.273	.018*

\*p<.05

Multiple regression analysis was performed to examine the relative contributions of EFC3, PFC3, DAS3, and PRQ3 on Taita Symptom Checklist (TSC). The results are presented in Table 15. The multiple correlation coefficient of TSC was .604, indicating 36.5% of the variance was explained by a linear combination of the predictors,  $F(4, 69)=9.90$ ,  $p<.01$ . The contribution of PFC3 is 34.6%, which is statistically significant at the .05 level. In other words, nearly 35% of variation in TSC was accounted for by PFC3 after controlling other factors. The contributions of DAS3, PRQ3, and EFC3 were not statistically significant given that PFC3 was in the model. The regression equation predicting TSC is:

$$TSC = .389 - .003(EFC3) + .091(PFC3) - .001(DAS3) - .002(PRQ3).$$

Table 15

Summary of Simultaneous Regression Analysis for Variables in Time 3  
Predicting the TSC at Time 3 (N=74)

Variable	B	SE B	$\beta$	P
(Constant)	.389	.361		.285
EFC3	-.003	.015	-.024	.843
PFC3	.091	.018	.582**	.000
DAS3	-.001	.005	-.018	.857
PRQ3	-.002	.003	-.120	.290

Note.  $R^2=.365$ .

\* $p<.05$ , \*\* $p<.01$

### Summary

This chapter presents the data analysis for the major study variables. The relationships of eight subscales of the Ways of Coping Questionnaire were examined and the combinations of the emotion-focused and problem-focused coping scales were formulated, based on the results of a zero-order correlation matrix. The emotion-focused coping scale consists of confrontive coping, self-controlling, accepting responsibility, and escape-avoidance subscales; the problem-focused coping scale consists of distancing, seeking social support, planful problem-solving, and positive reappraisal.

Repeated measures analyses were performed to examine the changes of coping, marital adjustment, social support, and infertility-specific distress scores over three times. There were no statistically significant changes in emotion-focused coping, marital adjustment, and infertility-specific distress scores over times 1, 2, and 3. Problem-focused coping and social support scores changed over the three times of data collection. Marital adjustment remained stable across the three times of data collection. Women in the sample perceived the most social support when they first entered the ART cycle and the least social support while they were waiting for the results of their pregnancy tests.

The function of social support was tested in the study resulting in the moderator effects on the infertility-specific distress. Findings of this chapter were provided as the base of modifying the proposed conceptual framework in chapter one. Moreover, a series of multiple regressions were conducted to examine the relative contributions of predictors collected at three times on infertility-specific distress. With regard to the regression equation at time 1, the significant predictor of infertility-specific distress at time 1 was PFC1. The linear combinations of EFC1, PFC1, DAS1, and PRQ1 accounted for 25.4% of the variance of ISDS1. In time 2, PFC2 was the significant predictor of ISDS2. EFC2, PFC2, DAS2, and PRQ3 explained 17.3% of the variance of ISDS2. In time 3, PRQ2 was the significant predictor of ISDS3. Additionally, the linear combinations of EFC3,

PFC3, DAS3, and PRQ3 accounted for 36.5% of the variance of TSC. The significant predictor of TSC was PRQ3 which accounted for 35% of variation in TSC. Discussions of the above findings, implications for nursing research, implications for clinical practice, and recommendations for nursing research are provided in chapter five.

## **Chapter V: Discussion**

This chapter presents a discussion of the study results in relation to previous studies, and provides implications for nursing practice regarding the health care of Taiwanese women receiving Assisted Reproductive Technologies (ART). Finally, recommendations for future research on women's distress when undergoing ART treatments are considered.

The purpose of the study was to examine changes in and relative contributions of emotion-focused coping, problem-focused coping, marital adjustment, and social support on Taiwanese women's experience of the distress during three stages of an ART cycle. The study variables were measured three times during an ART cycle: at ovulation stimulation, at the embryo transfer period, and at the period of waiting for the results of the pregnancy test. Descriptive statistics, repeated measures analyses and multiple regressions were conducted to answer the research questions.

### Research Question One

Are there patterns of relationships among the Ways of Coping Questionnaire (WCQ) items across times 1, 2, and 3?

### Conclusion

The WCQ consists of two subscales, emotion-focused coping and problem-focused coping. Zero-order correlations were used to examine patterns



among the WCQ items across times 1, 2, and 3. Results showed that items of four subscales—confrontive coping, self-controlling, accepting responsibility, and escape-avoidance—were correlated and these scales were viewed as emotion-focused coping scales. The subscales of distancing, seeking social support, planful problem-solving, and positive reappraisal were correlated and were viewed as problem-focused coping scales.

### Discussion

Women used aggressive efforts to change the situation, regulate their feelings of distress from receiving ART treatments, acknowledge their own role in the problem of infertility, or had a wishful thoughts to escape or avoid infertility-specific distress. In using problem-focused coping strategies, women used cognitive efforts to separate themselves or to minimize the significance of the infertility-specific distress. Some women made their efforts to seek informational support and emotional support, using an analytic approach to deal with infertility-specific distress. By using positive reappraisal women in the sample considered ART treatments as personal growth and created positive meanings from the ART cycle.

Although Lazarus and Folkman (1984) stated that coping is a process oriented effort, other researchers suggest that coping is a function of disposition. Analysis of the percentage of emotion-focused coping and problem-focused

coping was recommended by other researchers (Vitaliano, Mariur & Russo, 1987) because of the benefits of using relative coping scores instead of absolute coping scores to conceptualize and predict an individual's coping patterns. Further research may be needed to examine the percentage of each coping subscale that women use across the stages of the ART cycle to evaluate the function of personality disposition on coping.

#### Further Study

Because of the limited numbers of the total population of women receiving ART annually in Taiwan, no factor analysis was conducted to examine the subscales of ways of coping in the present study. Further research using factor analysis to confirm the structure of subscales of the WCQ in a large number of infertile women is needed to validate the structure of the Chinese WCQ.

#### Research Question Two

Do coping scores change over times 1, 2, and 3?

#### Conclusion

This question was answered by asking infertile women to complete the Ways of Coping Questionnaires (WCQ) three times. The WCQ consists of emotion-focused (EFC) and problem-focused coping (PFC) subscales. According to the theory of Lazarus and Folkman (1984), an individual employs both emotion-focused coping and problem-focused coping strategies in every

distressful event. Lazarus and Folkman (1984) stated that incorporating only one or the other coping strategy in the study of coping with the distress is not adequate. Therefore, in this study, both coping strategies were included to examine changes of coping scores across the three data collection times. There were statistically significant changes in frequency of use of problem-focused coping scores over times 1, 2, and 3. However, when the trend of PFC scores was examined PFC was found to be highest at the embryo transfer stage. Women in the embryo transfer stage used problem-focused coping strategies most frequently in comparison with the phase of ovulation stimulation and waiting for the results of the pregnancy tests. With regard to the changes of emotion-focused coping scores, no statistically significant changes were observed across time 1, time 2, and time 3. However, when the trend of emotion-focused coping strategies was examined, EFC scores were the highest at the embryo transfer stage.

Pair-sampled t tests were conducted to examine the differences of the frequency of use of two forms of coping strategies across times 1, 2, and 3. Results of the study indicate that women employed emotion-focused coping more frequently than did problem-focused coping strategies. Folkman and Lazarus (1986) stated that individuals differ in making coping efforts according to how they perceived the distressful encounters. The frequencies of using two forms of coping strategies vary in a given context based on the interaction of people and

the environment. Findings of the changes of coping scores between different periods of time are consistent with Folkman and Lazarus' (1986) premise.

### Discussion

Findings of this study are consistent with those of other researchers. McQuenney et al. (1997) found that women used more emotion-focused coping strategies to go through the interval from the stage of ovulation stimulation to that of embryo transfer, for there is little that women can do to boost the success rate. Folkman (1986) stated that people are apt to use more emotion-focused coping strategies when an encounter is perceived as highly threatening to their self-esteem. The stage of embryo transfer is one of the most distressful periods in an ART cycle. Approximately 15-20% of ART recipients are not able to continue ART treatments because of failure of oocyte maturation (Centers for Disease Control, 2000). Women feel that there is nothing they can do to increase the success of oocytes maturation. Therefore, use of emotion-focused coping strategies to avoid or self-control of thoughts about failure of oocyte maturation would seem appropriate in this situation. Women in this sample also used coping strategies of distancing themselves from disclosing the fact that they were undergoing the ART treatments. One of the subjects asked the ART team members not to call her at her work place because she did not want her coworkers to know that she was undergoing ART treatment. She admitted that when people

discovered that she was undergoing ART treatment, the tension that she experienced increased markedly.

In addition, Taiwanese women in this study reported a high frequency of using problem-focused coping strategies at the time of embryo transfer. Researchers found that problem-focused coping strategies were used more frequently as outcomes of the encounters were appraised as changeable (Folkman & Lazarus, 1980; 1985; Folkman, Lazarus, & Dunkel-Schetter, et al., 1986). When women moved forward to the stage of embryo transfer, they might feel that they have a higher possibility of achieving pregnancy. Results of this study are consistent with Su's (1995) research that Taiwanese women in the stage of embryo transfer adopted Chinese traditional medicine or cultural rituals to manage the distress of undergoing ART treatments.

#### Further Study

McQueeney et al. (1997) reported that women used more emotion-focused coping strategies to deal with their distress after failing to conceive. Further research is needed to examine the coping strategies that Taiwanese women employ to cope with ART outcomes of either success or failure in achieving pregnancy.

#### Research Question Three

Do Infertility-Specific Distress scores change over times 1, 2, and 3?

## Conclusion

Women's distress when receiving ART treatments was measured by the ISDS. There were no statistically significant changes of ISDS scores across the three times of data collection. The mean scores of the ISDS across the stages of the ART cycle were below the midpoint of the scale, suggesting that average women reported low infertility-specific distress across the stages of the ART cycle. Findings of this study were different from that of Boivinn and Takefman's (1995) study. In their findings women reported the highest levels of distress while they were waiting for the results of the pregnancy test. However, Boivinn and Takefman (1995) conducted a retrospective study to examine women's distress after they received the ART treatments. In their study, results of the ART treatments were disclosed before data collection started, and that might be a confounding factor in measuring women's distress of waiting for the results of the pregnancy test.

## Discussion

Although the changes of ISDS scores were not statistically significant across times 1, 2, and 3, it is worthy of mention that a small proportion (about 7-11%) of women in the sample were above the midpoint in ISDS scores at each stage of the ART cycle. Results of the study suggest that these women experienced more distress than other women in this sample. There is a need for

reproductive health care providers to be aware of those women with above average scores of infertility-specific distress and provide the necessary information about coping strategies to assist them to manage the distress when they are receiving ART treatments.

For the large majority of women in the sample, ISDS scores over the three times fell below the midpoint on distress items. The low distress may be related to these women's experience of prior ART treatments, in that they are familiar with the ART procedures. In addition, from the investigator's experience of interviewing the subjects, several women expressed the experience of tremendous distress while they were considering enrolling in the ART program. Once they had decided to undergo the ART treatments, they reported anecdotally that their level of distress decreased. They reported that they felt responsible for completing the ART cycle. It may be that their level of distress decreased below the midpoint of the scale because they had resolved some of their conflict by deciding to undergo ART treatments.

#### Research Question Four

Does social support function as moderator or mediator effect on infertility-specific distress and global severity of psychological symptoms?

## Conclusion

With regard to research question four, a series of multiple regressions were conducted. Data did not support the function of social support as a mediator for the infertility-specific distress and the severity of psychological symptoms. When product terms of coping and social support were added to the regression equations with the other predictor variables, statistically significant changes in  $R^2$  were found. Results of the study suggest that social support functions as a moderator of women's coping with the distress of ART treatments.

## Discussion

Findings from research question four contribute to an explanation of the low level of infertility-specific distress that women report across the stages of the ART cycle. Results of the study are consistent with that of Freeman, et al (1985) who found that women attempted to suppress their negative emotions about the ART treatments and exerted efforts to manage the emotional distress. Social support interacts with problem-focused coping to buffer the levels of infertility-specific distress. Results of this study suggested that some women experience more distress than others because of the ART treatments. Therefore, when high levels of distress were experienced, social support served as a buffer for the women in this sample.



### Future Study

The repeated experience of failing to conceive after ART treatments affects women's perceived social support. Women who had undergone previous ART treatments perceived above average levels of social support. However, 10% of women perceived their levels of social support below the average over times 1, 2, and 3. Reproductive technology teams need to identify those who are at risk of low social support and provide necessary support to assist them to cope with the distress of undergoing ART treatments. In future studies, the role of social support for women who failed to get pregnant needs to be explored. A follow-up study of the relationships of infertility-specific distress and social support for Taiwanese women who failed to achieve pregnancy needs to be considered.

### Research Question Five

Do the major variables change over time?

### Conclusion

Repeated measures analyses were used to answer research question five. There were no statistically significant changes in marital adjustment across three times of data collection. In addition, there were no statistically significant changes in marital adjustment between time 1 and time 2, time 2 and time 3, and time 1 and time 3. Results of the marital adjustment in this study are different from other researchers who found (Raval et al., 1987; Wallace, 1985) that marital

adjustment changed across the stages of the ART treatments. Although the distress of undergoing the ART treatments was reported, it may increase the dyadic cohesion and stability of their marital relationships. In reviewing the percentage of women's marital adjustment scores, approximately 10 % of women reported very much below the average T-scores of the norms in times 1, 2, and 3 indicating that the women in this study experienced difficulty in adjusting in marital relationships when undergoing the ART treatments. Provision of the information of marital counseling may be necessary for these participants.

Significant changes in perceived social support were revealed across times 1, 2, and 3. Pairwise comparisons of social support were performed to evaluate the differences between time 1 and time 2, time 2 and time 3, and time 1 and time 3. There were statistically significant changes in social support scores between time 2 and time 3, and between time 1 and time 3. These findings suggest that women in the sample perceived decreasing social support as they progressed through the stages of the ART cycle. These findings are in contrast to those of Boivin and Takefman (1996), who found that women in their study perceived the lowest social support during the phase of embryo transfer.

#### Future Study

There is lack of the male partners' reports of marital adjustment in the present study. Researchers (Dennerstein & Morse, 1985; Raval et al., 1987;

Wallace, 1985) suggest that the husband's reactions to ART treatments may affect the wife's marital adjustment. Further studies should include both partners' participation so that a better understanding may be obtained of marital adjustment within couples. Regarding the role of social support in an ART cycle, further research may be necessary to measure the resources that comprise social support for Taiwanese women undergoing the ART treatments.

#### Research Question Six

What are the relative contributions of emotion-focused coping, problem-focused coping, marital adjustment, and social support on Taiwanese women's experience of distress while receiving assisted reproductive technology?

#### Conclusion and Discussion

A series of multiple regressions were performed to examine the relative contributions of predictors on infertility-specific distress across the three stages of the ART cycle. Results of the study suggest that in the ovulation stimulation period, 25.7 % of variance was explained by EFC1, PFC1, DAS1, and PRQ1. PFC1 was the major predictor of women's infertility-specific distress in time 1. Results suggest that women in this sample used more problem-focused coping strategies in time 1, the higher their time 1 infertility-specific distress scores. Also in time 2 (embryo transfer) 17.3% ( $p < .05$ ) of women's distress was accounted for by EFC2, PFC2, DAS2, and PRQ2. PFC2 was again the major

predictor of women's infertility-specific distress. As women in the sample used more problem-focused coping, they experienced higher infertility-specific distress. In contrast, women who employed more emotion-focused coping strategies reported less infertility-specific distress. If the findings of this study are corroborated by future research, reproductive technology teams may consider facilitating women's use of emotion-focused coping strategies to decrease women's distress when undergoing the ART cycle.

In time 3, only the PRQ 2 was a statistically significant predictor of the ISDS3. EFC, PFC, and DAS in times 1, 2, and 3 did not contribute significantly to predicting the infertility-specific distress at time 3. In examining the variables to predict the severity of psychological symptoms of women in the sample, a regression model was obtained. EFC3, PFC3, DAS3, and PRQ3 accounted for 36.5% of the variance in TSC scores ( $p < .01$ ). PFC3 was the major predictor of the severity of psychological symptoms ( $p < .05$ ).

### Implications

#### Theoretical Issues

Findings of this study confirm the theory of Lazarus and Folkman (1984) that coping is a process and that individuals use a variety of strategies to cope with distress. The women in this sample used various coping strategies to cope with the distress of receiving ART treatments. Problem-focused coping scores

changed across different stages of the ART cycle. Results of regression analyses showed that problem-focused coping was the major predictor of infertility-specific distress at times 1 and 2. When predictors in time 1 and time 2 were added to the time 3 regression equation, a statistically significant regression model was obtained. PRQ2 was the major predictor of ISDS scores. These results are congruent with findings in research question four, suggesting that social support moderates the relationship of coping and infertility-specific distress across the three times of data collection and severity of psychological symptoms at time 3. That is, the effects of coping with the distress of receiving ART were buffered by the function of social support. No mediating effects of social support on ISDS and TSC were observed. Results of the study provide empirical evidence for modifying the conceptual framework of the study. The new conceptual framework is presented in Figure 4.

Results of the study provide a basic understanding of the relative contributions of the two forms of coping strategies, marital adjustment, and social support on women's distress while receiving ART treatments. In the ovulation stimulation stage, emotion-focused and problem-focused coping, marital adjustment, and social support explain 25.4% of the variance of infertility-specific distress. In the stage of embryo transfer, 17.3% of the variance was explained by the four predictors. However, approximately 70-80 % of the variance of the

outcome variables was not explained by the four predictors. Further research is needed to explore other factors that may contribute to a better explanation of women's distress while undergoing ART.

### Methodological Issues

There are advantages of using repeated measures design in examining women's coping with the distress of ART treatment. Because of the unique nature of every stage of an ART cycle, the repeated measures design allows the principal investigator to study the within-subjects effects of coping on distress. Additionally, the repeated measures design is beneficial in small sample size studies because it allows the same null hypotheses with the same level of statistical power but with a smaller number of subjects (Huck, 2000). There are also, however, some disadvantages in using a repeated measures design. First, the generalizability of the results is limited in comparison to the study using the same number of data from measuring the subjects one time (Huck, 2000). Selection of a second sample to replicate the study may enhance the validation of the results of the present study.

Second, carry-over effects are possible because subjects' responses are affected by their previous responses to the same items. However, changing of the order of administering the questionnaires was not available in this study of ART treatments. Third, subjects' scores may be influenced by the effects of fatigue or

practice. The possibility of fatigue and practice effects in the study sample may have contributed to the finding of no significant predictors of infertility-distress at time 3 when the other predictors in times 1 and 2 were controlled. Further research may need to increase the interval between data collection times to decrease these carryover effects.

A major point of Lazarus and Folkman's theory of stress and coping is cognitive appraisals. From the principal investigator's clinical experience, women usually experience emotional distress before they decide to receive the ART treatments. Research is need to explore how a woman appraises the event of receiving an ART cycle and whether this appraisal may influence her later adaptation when undergoing the ART treatments. Further research which begins data collection at the time when women are considering the decision of whether to undergo of ART may provide more in-depth information of women's coping with the distress of receiving ART treatments.

The reliability and stability of the WCQ is an issue that needs further examination in future studies. Folkman and Lazarus (1988) stated that factor structure of the subscales of the WCQ may be affected by personality, the nature of the situations, and the psychometric properties of the scales. The influence of culture could affect an individual's responses to items that measure coping strategies. For example, one item in the confrontive coping subscale of the WCQ

is “I express anger to the persons who caused the problem.” The confrontive coping subscale is considered a problem-focused coping strategy. However, in the Chinese culture women are typically reluctant to express anger. Indeed to do so would demand a high level of emotional investment. Therefore, this specific coping strategy might well be considered an emotion-focused coping strategy for the Chinese women who made up this study sample.

Translation of the ISDS may also affect the interpretation of the meaning of some items. Women in the study stated that some of the items in the WCQ were unclear and confusing. Therefore, further examination of the translation of the Chinese WCQ needs to be conducted in future studies. Finally, the WCQ is a self-report questionnaire to examine people’s coping strategies. Folkman and Lazarus (1986) suggest that using an interview before and after subjects fill out the questionnaire might help the respondents to focus on a specific distress rather than a general condition and thus decrease the bias of recall for their coping strategies. Therefore, further research may benefit from use of an interview to collect data about ways of coping in regard to a specific stressor.

#### Nursing Practice

Results of the study may provide the preliminary information for health care providers of reproductive technology teams in Taiwan. According to the findings of this study, women use various forms of coping to manage the distress



of receiving ART treatments. Folkman and Lazarus (1984) stated that there are no bad or good coping strategies. Reproductive health care teams need to be attentive to facilitating women's coping with the distress in the stages of ovulation stimulation, embryo transfer, and period of waiting for the results of the pregnancy test. For those women in the stage of embryo transfer, use of emotion-focused and problem-focused coping strategies are related to infertility-specific distress. In the stage of waiting for the results of the pregnancy test, the lowest levels of perceived social support were found in the study sample. Nursing professionals need to assess women's resources of social support and facilitate ways by which women receive sufficient social support.

With regard to marital adjustment, there were no statistically significant changes in marital adjustment scores across the three times of data collection. However, approximately 10 percent of women in the sample reported very much below average marital adjustment scores. Marital consultation may be necessary for these women. Additionally, nursing professionals need to identify the couples' dynamics while they are undergoing the ART treatments. Husbands may also need support from the reproductive team members.

#### Recommendations for Future Research

Using focus groups to explore how women cope with the distress of ART treatment across the stages of ovulation stimulation and period of waiting for the

results of pregnancy test may provide more details about how women use different coping strategies to manage the distress of ART. Because of the purpose of the study, there is no follow-up for the coping strategies that women in this sample used whether they failed or succeeded to achieve pregnancy through ART treatment. A follow-up study for women with different results of pregnancy tests needs to be considered. Exploration of the differences in infertility-specific distress, emotion-focused and problem-focused coping, marital adjustment, and social support between women who succeed and those who fail to conceive may provide valuable information.

Based upon the findings of this correlational study, an experimental study to investigate the efficacy of problem-focused and emotion-focused coping interventions across stages of the ART cycle is needed. Using a diary or log to record women's distress and coping strategies may help to eliminate the memory errors of recalling the coping strategies that they used across the stages of the ART treatments.

In summary, this chapter presented the conclusions and discussions of the study. Discussions of theoretical and methodological issues were incorporated into this chapter. Implications for nursing practice and suggestions for future studies were included.

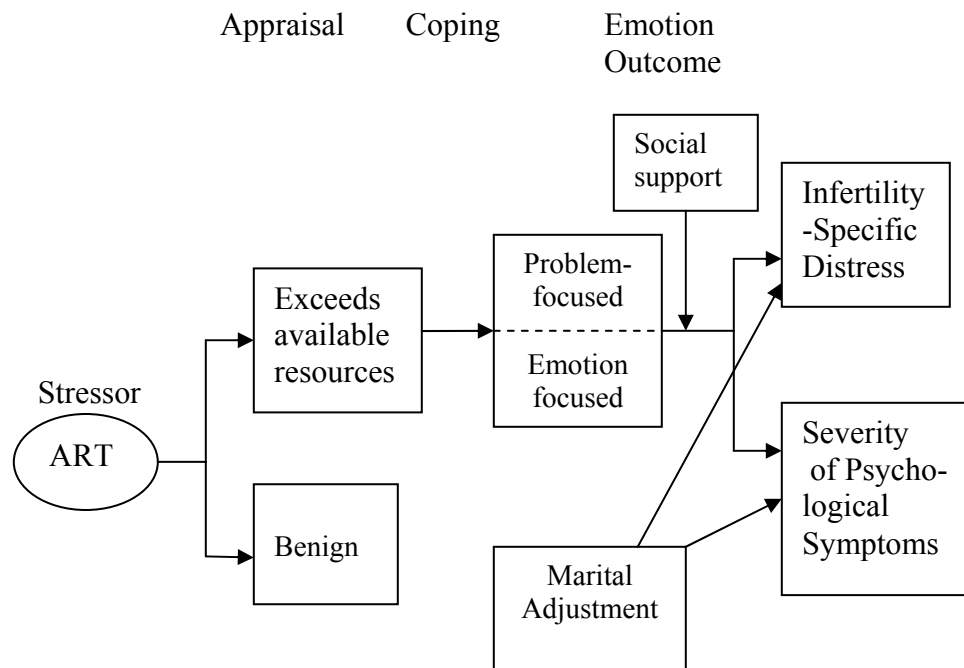


Figure 4 Modified conceptual framework of women's coping with the distress of receiving assisted reproductive technology

## **Appendices**

## Appendix A

### Information Letter

(Given to potential participants by the TUBE Fertility Clinic  
staff nurse research assistant)

#### FACTORS RELATED TO TAIWANESE WOMEN'S STRESS WHILE UNDERGOING ASSISTED REPRODUCTIVE TECHNOLOGIES

---

Hello, my name is Yao-Hua Wang and I am a nursing doctoral student at the University of Texas at Austin. I would like to invite you to participate in my dissertation study. This study involves filling out three sets of questionnaires that will help me learn about the factors related to women's distress while undergoing Assisted Reproductive Technologies. You are being asked to participate in the study because you are married, between the ages of 20-50, and are enrolling in the Assisted Reproductive Technology Program of the TUBE Fertility Clinic. If you participate, you will be one of eighty-five Taiwanese women invited to participate in this study.

If after reading this information letter, you are interested in possibly participating in the study, please mail to me the attached postcard giving me permission to contact you. I will then telephone you to arrange to meet you at your clinic visit to answer any questions that you may have with regard to participating in the study. If you agree to participate in the study, you will be asked to sign a consent form. In addition, you will be asked to sign a TUBE Fertility Clinic medical release form to allow the investigator to obtain medical information related to the result of the pregnancy test for the current Assisted Reproductive Technology cycle.

After the consent form is signed, you will be given questionnaires about your coping strategies, social relationships, marital relationships and distress while receiving Assisted Reproductive Technologies. You will be asked to complete questionnaires at three different times during your Assisted Reproductive Technology cycle. The first questionnaires will be administered at your first scheduled ultrasound examination in the clinic. The second questionnaires will be administered in the clinic at three to four hours after embryo implantation. The third questionnaires will be administered on the day when you visit the clinic for pregnancy testing, but before the pregnancy result is

given. You can fill out the questionnaires at your convenience at the clinic. Each of the three sets of questionnaires will take approximately 30-35 minutes for you to complete. A general information form will be administered with the first questionnaire set and it will take about 2-3 minutes to complete.

There are minimal risks as a result of participating in the study. Some women may feel uncomfortable about answering certain questions. If you do not want to answer any question, you are not required to answer every question. You are welcome to discuss with the researcher any concerns or feelings of discomfort, or the researcher can refer you to other health professionals if you wish. The information you provide will help the health care providers better understand women's needs when undergoing Assisted Reproductive Technologies. As a token of the investigator's appreciation you will receive a small gift for each questionnaire set you complete.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Coded questionnaires will be used to maintain confidentiality; no personal identifying information will be on the forms that you complete so that you cannot be identified in any way. Your responses will not be linked to your name in any written or verbal report of this research project. The consent form, all the questionnaires, and a list linking names and code numbers will be kept locked in a cabinet for privacy so that only the researcher and her dissertation committee will have access to the information. All the information obtained in connection with the study will be reported only as group data; there will be no way for answers to be associated with a particular individual.

Your decision to participate or not to participate in this study will not affect your present or future relationship with the University of Texas at Austin or any one at the Test Tube clinic. Your decision will not affect your right to receive fertility care at the TUBE Fertility Clinic.

You are making a decision whether or not to participate. Your returning of the attached postcard indicates that you have read the information provided above and have decided to participate in the study. If you later decide that you do not want to participate in the study, simply tell me. You may discontinue your participation in this study at any time.

If you have any questions about the study, please ask me. If you have any questions later, contact me or my supervisor, Professor Penticuff at the following address and the telephone number. We will be happy to answer your questions.

If you have any questions or concerns about your treatment as a research participant in this study, call Professor Clarke Burnham, Chair of Human Research Participants at 002-1-512-232-4383. You may change your mind at any time and leave the study without any consequence to you.

Yao-Hua Wang, R.N., M. S.  
No. 1 University Road, Tainan, Taiwan  
Telephone: 092-992-1020

Joy H. Penticuff, R.N., Ph. D.  
School of Nursing, The University of Texas at Austin  
1700 Red River, Austin, Texas 78701-1499  
Telephone: 002-1-512-471-9087

## Appendix B

### Consent Form

#### FACTORS RELATED TO TAIWANESE WOMEN'S STRESS WHILE UNDERGOING ASSISTED REPRODUCTIVE TECHNOLOGIES

You are invited to participate in a study about Taiwanese women's stress while undergoing Assisted Reproductive Technologies. My name is Yao-Hua Wang and I am a nursing doctoral student at the University of Texas at Austin. This study will provide important information for my dissertation. I will work under the supervision of Joy Penticuff, Ph.D., RN, a professor at the University of Texas at Austin, School of Nursing. I hope to learn about the factors related to women's distress of receiving Assisted Reproductive Technologies. You are being asked to participate in the study because you are married, between the ages of 20-50, are enrolling in the Assisted Reproductive Technology Program of the TUBE Fertility Clinic, and indicated your willingness to participate in the study by previously returning a postcard. If you participate, you will be one of eighty-five Taiwanese women invited to participate in this study.

If you decide to participate, I will meet you at your clinic visit to answer any questions that you may have with regard to participating in the study. If you agree to participate in the study, you will be asked to sign a consent form. In addition, you will be asked to sign a TUBE Fertility Clinic medical release form to allow the investigator to obtain the result of the pregnancy test for the current Assisted Reproductive Technology cycle.

After the permission is obtained from you, you will be given questionnaires about your coping strategies, social relationships, marital relationships and distress while receiving Assisted Reproductive Technologies. You will be asked to complete questionnaires at three different times during your Assisted Reproductive Technology cycle. The first questionnaires will be administered at your first scheduled ultrasound examination in the clinic. The second questionnaires will be administered in the clinic at three to four hours after embryo implantation. The third questionnaires will be administered on the day when you visit the clinic for pregnancy testing, but before the pregnancy result is given. You can fill out the questionnaires at your convenience at the clinic. Each of the three sets of questionnaires will take approximately 30-35 minutes for you to complete. A general information form will be administered with the first questionnaire set and it will take about 2-3 minutes to complete. Coded questionnaires will be used to



maintain confidentiality; no personal identifying information will be on the forms that you complete so that you cannot be identified in any way.

There are minimal risks as a result of participating in the study. Some women may feel uncomfortable about answering certain questions. If you do not want to answer any question, you are not required to answer every question. You are welcome to discuss with the researcher any concerns or feelings of discomfort, or the researcher can refer you to other health professionals if you wish. There is no cost and no compensation to you for participating in this study. The study has no direct benefit to you but the information you provide will help the health care providers better understand women's needs when undergoing Assisted Reproductive Technologies. As a token of the investigator's appreciation you will receive a small gift for each questionnaire set you complete.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Your responses will not be linked to your name in any written or verbal report of this research project. The consent form, all the questionnaires, and a list linking names and code numbers will be kept locked in a cabinet for privacy so that only the researcher and her dissertation committee will have access to the information. All the information obtained in connection with the study will be reported only as group data; there will be no way for answers to be associated with a particular individual.

Your decision to participate or not to participate in this study will not affect your present or future relationship with the University of Texas at Austin or any one at the TUBE Fertility Clinic. Your decision will not affect your right to receive fertility care at the TUBE Fertility Clinic.

You will be given a copy of this consent form for your records.

If you have any questions about the study, please ask me. If you have any questions later, contact me or my supervisor, Professor Penticuff at the following address and the telephone number. We will be happy to answer your questions. If you have any questions or concerns about your treatment as a research participant in this study, call Professor Clarke Burnham, Chair of Human Research Participants at 002-1-512-232-4383.

You are making a decision whether or not to participate. Your signature below indicates that you have read the information provided above and have decided to participate in the study. If you later decide that you do not want to participate in the study, simply tell me. You may discontinue your participation in this study at any time.

Yao-Hua Wang, R.N., M. S.  
No. 1 University Road, Tainan, Taiwan 701  
Telephone: 092-992-1020

Joy H. Penticuff, R.N., Ph. D.  
School of Nursing, The University of Texas at Austin  
1700 Red River, Austin, Texas 78701-1499  
Telephone: 002-1-512-471-9087

---

Printed Name of Participant

---

Signature of Participant

---

Date

---

Signature of Investigator

---

Date

Appendix C  
**Personal Information Form**

Date of Birth \_\_\_\_\_ Today's date \_\_\_\_\_ Code: \_\_\_\_\_  
Phone number \_\_\_\_\_

Highest Levels of Education Completed

\_\_\_\_ Grade 1 through 11      \_\_\_\_ High school education  
\_\_\_\_ Vocational training      \_\_\_\_ Some college  
\_\_\_\_ Associate degree      \_\_\_\_ College graduate  
\_\_\_\_ Graduate education

Religion

\_\_\_\_ Buddhism      \_\_\_\_ Christian      \_\_\_\_ Catholic  
\_\_\_\_ Taoism      \_\_\_\_ None      \_\_\_\_ Other

How long have you been trying to conceive a child? \_\_\_\_\_  
Years \_\_\_\_\_ Months \_\_\_\_\_

Do you currently have biological children?

\_\_\_\_ No  
\_\_\_\_ Yes; Number \_\_\_\_\_ Ages \_\_\_\_\_

Is your infertility diagnosed?

\_\_\_\_ Yes      Diagnosis \_\_\_\_\_  
\_\_\_\_ No

How many times have you previously undergone any of the following infertility treatments?

\_\_\_\_ Ovulation stimulation, number of times \_\_\_\_  
\_\_\_\_ Artificial insemination, number of times \_\_\_\_  
\_\_\_\_ In-vitro fertilization, number of times \_\_\_\_  
\_\_\_\_ Gamete intrafallopian transfer, number of times \_\_\_\_  
\_\_\_\_ Other \_\_\_\_\_, number of times \_\_\_\_

Is this ART cycle your final attempt to use ART to achieve a pregnancy?

No \_\_\_\_

Yes \_\_, if so, what is the reason?

Cost \_\_\_\_\_ Stress \_\_\_\_\_ Inconvenience \_\_\_\_\_  
Plan to adopt \_\_\_\_\_ Other \_\_\_\_\_

# Appendix D Infertility-Specific Distress Scale

Code: \_\_\_\_\_

Below are five statements about your life with which you may agree or disagree. Read each item and then mark the appropriate answer in the space next to that word. Indicate the extent of your agreement with the statements as reflecting how you have felt over the past week. Use the following scale to record your answers:

1	2	3	4	5	6	7
strongly disagree						strongly agree

1. \_\_\_\_ In most ways my life is close to my ideal.
2. \_\_\_\_ The conditions of my life are excellent.
3. \_\_\_\_ I am satisfied with my life.
4. \_\_\_\_ So far I have gotten the important things I want in life.
5. \_\_\_\_ If I could live my life over, I would change almost nothing.

Please complete the following items to pertain to your feelings about your assisted reproductive technology treatment. Place a number to the left of each item to indicate how descriptive that item is of your feelings over the past week regarding your assisted reproductive technology treatment, using the following response scale:

1	2	3	4	5
Not at all	Somewhat	Moderately	Very much	Exactly
like I have felt	like I have felt	like I have felt	like I have felt	like I have felt

- |                    |                       |                       |
|--------------------|-----------------------|-----------------------|
| ____ 1. Empty      | ____ 8. Confident     | ____ 15. Sad          |
| ____ 2. Happy      | ____ 9. Contented     | ____ 16. Frustrated   |
| ____ 3. Depressed  | ____ 10. Disappointed | ____ 17. Impatient    |
| ____ 4. Optimistic | ____ 11. Left out     | ____ 18. Enthusiastic |
| ____ 5. Lonely     | ____ 12. Capable      | ____ 19. Worried      |
| ____ 6. Angry      | ____ 13. Secure       | ____ 20. Pleased      |
| ____ 7. Proud      | ____ 14. Competent    |                       |

THANK YOU VERY MUCH FOR YOUR PARTICIPATION.

Appendix E  
**Taita Symptoms Checklist** (English translation version)

Code: \_\_\_\_\_

Below are conditions that people may experience. Please read each one and circle the number that describes how much do you experience the symptoms bothered you during the past month including today.

<u>None</u>	<u>Mild</u>	<u>Moderately</u>	<u>Severely</u>	<u>Extremely</u>	
0	1	2	3	4	
<u>How much do you experience the following symptoms</u>					
1. Numbness .....	0	1	2	3	4
2. Fatigue .....	0	1	2	3	4
3. Body aching or back pain.....	0	1	2	3	4
4. Nausea or vomiting .....	0	1	2	3	4
5. Headache .....	0	1	2	3	4
6. Chest pain or heart pain.....	0	1	2	3	4
7. Doing things deliberately to achieve perfection.....	0	1	2	3	4
8. Repeatedly count numbers to avoid miscalculation.....	0	1	2	3	4
9. Abhorrence of mess.....	0	1	2	3	4
10. Not confident of what you have done ....	0	1	2	3	4
11. Thoughts in mind and cannot get rid of .	0	1	2	3	4
12. Hard to make decisions .....	0	1	2	3	4
13. Feeling of being watched by others.....	0	1	2	3	4
14. Feel easily hurt .....	0	1	2	3	4
15. Hard to concentrate .....	0	1	2	3	4
16. No one understands or likes me .....	0	1	2	3	4
17. Unable to have eye-to-eye contact with people, especially with the females.....	0	1	2	3	4
18. Feeling inferior to others .....	0	1	2	3	4
19. Hard to sleep deeply .....	0	1	2	3	4
20. Loss of energy, slow response.....	0	1	2	3	4
21. Feeling of loneliness, blue, easy to cry ..	0	1	2	3	4

<u>None</u>	<u>Mild</u>	<u>Moderately</u>	<u>Severely</u>	<u>Extremely</u>	
0	1	2	3	4	
<u>How much do you experience the following symptoms</u>					
22. Feeling of worthless .....	0	1	2	3	4
23. No interest in doing anything .....	0	1	2	3	4
24. Comprehension diminish.....	0	1	2	3	4
25. Dizziness .....	0	1	2	3	4
26. Shortness of breath .....	0	1	2	3	4
27. Tense, restlessness.....	0	1	2	3	4
28. Fear of what may happen .....	0	1	2	3	4
29. Tremor .....	0	1	2	3	4
30. Feel under pressure.....	0	1	2	3	4
31. Having an urge or desire to hurt someone.....	0	1	2	3	4
32. Drinking alcohol when stressed out .....	0	1	2	3	4
33. Easily argue with people .....	0	1	2	3	4
34. Easily fight with people.....	0	1	2	3	4
35. Easily lose temper, lose control.....	0	1	2	3	4
36. Having a desire to break something .....	0	1	2	3	4
37. Fear of taking elevators .....	0	1	2	3	4
38. Uncomfortable being alone .....	0	1	2	3	4
39. Uneasy in crowded places, such as bus stops or department stores .....	0	1	2	3	4
40. Fear of taking train or bus .....	0	1	2	3	4
41. Fear of being in large places .....	0	1	2	3	4
42. Lack of ease in a social situation.....	0	1	2	3	4
43. Feel that I have severe health problems .	0	1	2	3	4
44. Feel like that I have mental problems ....	0	1	2	3	4

## Appendix F

### Ways of Coping Questionnaire

Code: \_\_\_\_\_

Below is a list of ways of people cope with a wide variety of stressful events. Please indicate, by circling the appropriate number, the strategies you are using in dealing with your infertility.

- 0 Does not apply and/or not used
- 1 Used somewhat
- 2 Used quite a bit
- 3 Used a great deal

**Please try to respond to every question.**

---

1. I just concentrate on what I have to do the next step .....	0	1	2	3
2. I try to analyze the problem in order to understand it better.....	0	1	2	3
3. Turn to work or substitute activity to take my mind off things. ....	0	1	2	3
4. I feel that time will make a difference-the only thing to do is wait. ....	0	1	2	3
5. Bargain or compromise to get something positive from the situation. ....	0	1	2	3
6. I'm doing something which I don't think will work but at least I'm doing something. ....	0	1	2	3
7. Try to get the person responsible to change his or her mind.....	0	1	2	3
8. Talk to someone to find out more about the situation. ....	0	1	2	3
9. Criticize or lecture myself. ....	0	1	2	3
10. Try not to burn my bridges but leave things somewhat open. ....	0	1	2	3
11. Hope a miracle will happen.....	0	1	2	3
12. Go along with fate; sometimes I just have bad luck. ....	0	1	2	3
13. Go on as if nothing is happening.....	0	1	2	3
14. I try to keep my feelings to myself.....	0	1	2	3

- 0 Does not apply and/or not used
- 1 Used somewhat
- 2 Used quite a bit
- 3 Used a great deal

---

15. Look for the silver lining, so to speak, try to look on the bright side of things. ....	0	1	2	3
16. Sleep more than usual. ....	0	1	2	3
17. I express anger to the person(s) who caused the problem.....	0	1	2	3
18. Accept sympathy and understanding from someone.....	0	1	2	3
19. I tell myself things that help me feel better. ....	0	1	2	3
20. I am inspired to do something creative. ....	0	1	2	3
21. Try to forget the whole thing.....	0	1	2	3
22. I'm getting professional help.....	0	1	2	3
23. I'm changing or growing as person in a good way. ....	0	1	2	3
24. I'm waiting to see what will happen before doing something. ....	0	1	2	3
25. Apologize or do something to make up. ....	0	1	2	3
26. I'm making a plan of action and following it.....	0	1	2	3
27. I accept the next best thing to what I want.....	0	1	2	3
28. I let my feelings out somehow. ....	0	1	2	3
29. Realize I brought the problem on myself. ....	0	1	2	3
30. I'll come out of the experience better than I went in.....	0	1	2	3
31. Talk to someone who can do something concrete about the problem. ....	0	1	2	3
32. Get away from it for a while; try to rest or take a vacation. ....	0	1	2	3
33. Try to make myself feel better by eating, drinking, .... smoking, using drugs or medications, etc.	0	1	2	3
34. Take a big chance or do something risky.....	0	1	2	3
35. I try not to act too hastily or follow my first hunch. ....	0	1	2	3
36. Find new faith.....	0	1	2	3
37. Maintain my pride and keep a stiff upper lip. ....	0	1	2	3



- 0 Does not apply and/or not used
- 1 Used somewhat
- 2 Used quite a bit
- 3 Used a great deal

---

38. Rediscover what is important in life. ....	0	1	2	3
39. Change something so things will turn out all right. ....	0	1	2	3
40. Avoid being with people in general. ....	0	1	2	3
41. Don't let it get to me; refuse to think too much about it. ....	0	1	2	3
42. Ask a relative or friend I respect for advice. ....	0	1	2	3
43. Keep others from knowing how bad things are. ....	0	1	2	3
44. Make light of the situation; refuse to get too serious about it. ....	0	1	2	3
45. Talk to someone about how I feel. ....	0	1	2	3
46. Stand my ground and fight for what I want. ....	0	1	2	3
47. Take it out on other people. ....	0	1	2	3
48. Draw on my past experience; I was in a similar situation before. ....	0	1	2	3
49. I know what has to be done, so I am doubling my efforts to make things work. ....	0	1	2	3
50. Refuses to believe it will happen. ....	0	1	2	3
51. Make a promise to myself that things will be different next time. ....	0	1	2	3
52. Come up with a couple of different solutions to the problem. ....	0	1	2	3
53. Accept it, since nothing can be done. ....	0	1	2	3
54. I try to keep my feelings from interfering with other things too much. ....	0	1	2	3
55. Wish that I can change what is happening or how I feel. ....	0	1	2	3
56. Change something about myself. ....	0	1	2	3

- 0 Does not apply and/or not used
- 1 Used somewhat
- 2 Used quite a bit
- 3 Used a great deal

---

57. I daydream or imagine a better time or place than the one I am in. ....	0	1	2	3
58. Wish that the situation would go away or somehow to over with. ....	0	1	2	3
59. Have fantasies or wishes about how things might turn out. ....	0	1	2	3
60. I pray. ....	0	1	2	3
61. I prepare myself for the event. ....	0	1	2	3
62. I go over in my mind what I will say or do. ....	0	1	2	3
63. I think about how a person I admire would handle this situation and use that as a model. ....	0	1	2	3
64. I try to see things form the other person's point of view. ....	0	1	2	3
65. I remind myself how much worse things could be. ....	0	1	2	3
66. I jog or exercise. ....	0	1	2	3

### Appraisal of Controllability

Now please recall to what extent you think you can control the situation of the specific encounter you have just described since it happened. Please read the following statements and circle the appropriate category.

	Strongly disagree			Strongly agree		
1. Do you believe that you can solve the problem?	1	2	3	4	5	
2. Do you feel that it is nearly impossible to change the situation?	1	2	3	4	5	

	Strongly disagree			Strongly agree	
3. Do you feel that it does not pay to try?	1	2	3	4	5
4. Do you think that you can get your own way if you keep trying?	1	2	3	4	5
5. Do you think there is very little you can do to solve the problem?	1	2	3	4	5

**Stop Here**

Appendix G  
**Dyadic Adjustment Scale**

Code: \_\_\_\_\_

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner at the present time by circling the appropriate number for each item on the following list.

	Always <u>Agree</u> 5	Almost always <u>Agree</u> 4	Occa- sionally <u>Disagree</u> 3	Fre quently <u>Disagree</u> 2	Almost Always <u>Disagree</u> 1	Always <u>Disagree</u> 0	
1. Handling family finances				5	4	3	2 1 0
2. Matters of recreation				5	4	3	2 1 0
3. Religious matters				5	4	3	2 1 0
4. Demonstration of affection				5	4	3	2 1 0
5. Friends				5	4	3	2 1 0
6. Sex relations				5	4	3	2 1 0
7. Conventionality (correct or proper Behavior)				5	4	3	2 1 0
8. Philosophy of life				5	4	3	2 1 0
9. Ways of dealing with parents or in-law				5	4	3	2 1 0
10. Aims, goals, and things believed important				5	4	3	2 1 0
11. Amount of time spent together				5	4	3	2 1 0
12. Making major decisions				5	4	3	2 1 0
13. Household tasks				5	4	3	2 1 0
14. Leisure time interests and activities				5	4	3	2 1 0
15. Career decision				5	4	3	2 1 0

Please answer the following questions by circling the response that best describes your relationship.

<u>All</u> <u>the time</u>	<u>Most of</u> <u>the time</u>	<u>More often</u> <u>than not</u>	<u>Occa-</u> <u>sionally</u>	<u>Rarely</u>	<u>Never</u>
0	1	2	3	4	5

16. How often do you discuss or have you considered divorce, separation, or terminating your relationship?      0      1      2      3      4      5

17. How often do you or your spouse leave the house after a fight?      0      1      2      3      4      5

18. In general, how often do you think that things between you and your partner are going well?      0      1      2      3      4      5

19. Do you confide in your spouse?      0      1      2      3      4      5

20. Do you ever regret that you are married?      0      1      2      3      4      5

21. How often do you and your partner quarrel?      0      1      2      3      4      5

22. How often do you and your spouse "get on each other's nerves?"      0      1      2      3      4      5

	Every Day	Almost Every Day	Occa sionally	Rarely	Never
23. Do you kiss your spouse?	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>

24. Do you and your spouse engage in outside interests together?	All of them	Most of them	Some of them	Very few of them	None of them
	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>

How often would you say the following events occur between you and your spouse?

Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often	
0	1	2	3	4	5	
25. Have a stimulating exchange of ideas	0	1	2	3	4	5
26. Laugh together			0	1	2	3 4 5
27. Calmly discuss something			0	1	2	3 4 5
28. Work together on a project			0	1	2	3 4 5

There are the things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinion or were problems in your relationship during the past few weeks. (Check yes or no)

29. Being too tired for sex Yes 0 No 1
30. Not showing love Yes 0 No 1

31. The dots on the following line represent different degrees of happiness in your relationship. The middle point "happy" represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered of your relationship.

0 1 2 3 4 5 6

.....

Extremely Fairly A little Happy Very Extremely Perfect  
Unhappy Unhappy Unhappy happy happy

32. Which of the following statements best describe how you feel about the future of your relationship? Circle one.

- 5 I want desperately for my relationship to succeed, and *would go to almost any length* to see that it does.
- 4 I want very much for my relationship to succeed, and *will do all I can to see* that it does.
- 3 I want very much for my relationship to succeed, and *will do my fair share* to see that it does.
- 2 It would be nice if my relationship succeeded, but *I can't do much more than I am doing* now to help it succeed.
- 1 It would be nice if it succeeded, but I *refuse to do any more than I am doing* now to keep the relationship going.
- 0 My relationship can never succeed, and *there is no more that I can do* to keep the relationship going.

Appendix H  
**Personal Resource Questionnaire 85 Part II**

Code: \_\_\_\_\_

Below are some statements with which some people agree and others disagree. Please read each statement and CIRCLE the response most appropriate for you. There is no right or wrong answer.

- 1 = STRONGLY DISAGREE  
2 = DISAGREE  
3 = SOMEWHAT DISAGREE  
4 = NEUTRAL  
5 = SOMEWHAT AGREE  
6 = AGREE  
7 = STRONGLY AGREE

STATEMENTS

---

1. There is someone I feel close to  
who makes me feel secure..... 1   2   3   4   5   6   7
2. I belong to a group in which I feel  
important ..... 1   2   3   4   5   6   7
3. People let me know that I do well at  
my work (job, homemaking) ..... 1   2   3   4   5   6   7
4. I can't count on my relatives and friends  
to help me with problems ..... 1   2   3   4   5   6   7
5. I have enough contact with the person  
who makes me feel special..... 1   2   3   4   5   6   7
6. I spend time with others who have the  
same interests that I do ..... 1   2   3   4   5   6   7
7. There is little opportunity in my life to be  
giving and caring to another person ..... 1   2   3   4   5   6   7

- 1 = STRONGLY  
DISAGREE  
2 = DISAGREE  
3 = SOMEWHAT  
DISAGREE  
4 = NEUTRAL  
5 = SOMEWHAT AGREE  
6 = AGREE  
7 = STRONGLY AGREE

#### STATEMENTS

---

8. Others let me know that they enjoy working  
with me (job, committees, projects) ..... 1   2   3   4   5   6   7
9. There are people who are available if I needed  
help over an extended period of time ..... 1   2   3   4   5   6   7
10. There is no one to talk to about how I  
am feeling ..... 1   2   3   4   5   6   7
11. Among my group of friends we do favors  
for each other ..... 1   2   3   4   5   6   7
12. I have the opportunity to encourage others  
to develop their interests and skills ..... 1   2   3   4   5   6   7
13. My family lets me know that I am important  
for keeping the family running ..... 1   2   3   4   5   6   7
14. I have relatives or friends that will help me  
out even if I can't pay them back ..... 1   2   3   4   5   6   7
15. When I am upset there is someone I can be  
with who lets me be myself ..... 1   2   3   4   5   6   7
16. I feel no one has the same problems as I ..... 1   2   3   4   5   6   7



- 1 = STRONGLY DISAGREE  
 2 = DISAGREE  
 3 = SOMEWHAT  
     DISAGREE  
 4 = NEUTRAL  
 5 = SOMEWHAT AGREE  
 6 = AGREE  
 7 = STRONGLY AGREE

STATEMENTS

---

17. I enjoy doing little “extra” things that make  
 another person’s life more pleasant..... 1    2    3    4    5    6    7
18. I know that others appreciate me as a  
 person ..... 1    2    3    4    5    6    7
19. There is someone who loves and cares about  
 me ..... 1    2    3    4    5    6    7
20. I have people to share social events and fun  
 activities with ..... 1    2    3    4    5    6    7
21. I am responsible for helping provide for  
 another person’s needs ..... 1    2    3    4    5    6    7
22. If I need advice there is someone who would  
 assist me to work out a plan for dealing with  
 the situation ..... 1    2    3    4    5    6    7
23. I have a sense of being needed by another  
 person ..... 1    2    3    4    5    6    7
24. People think that I’m not as good a friend  
 as I should be..... 1    2    3    4    5    6    7
25. If I got sick, there is someone to give me  
 advice about caring for myself..... 1    2    3    4    5    6    7

# Appendix I State Anxiety Inventory

A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

<u>Not at all</u>	<u>Somewhat</u>	<u>Moderately so</u>	<u>Very much so</u>	
1	2	3	4	
1. I feel calm.....	1	2	3	4
2. I feel secure .....	1	2	3	4
3. I feel tense .....	1	2	3	4
4. I feel strained.....	1	2	3	4
5. I feel at ease.....	1	2	3	4
6. I feel upset .....	1	2	3	4
7. I feel presently worrying over possible misfortunes .....	1	2	3	4
8. I feel satisfied .....	1	2	3	4
9. I feel frightened .....	1	2	3	4
10. I feel comfortable .....	1	2	3	4
11. I feel self-confident .....	1	2	3	4
12. I feel nervous.....	1	2	3	4
13. I am jittery .....	1	2	3	4
14. I feel indecisive .....	1	2	3	4
15. I feel relaxed.....	1	2	3	4
16. I feel content.....	1	2	3	4
17. I am worried .....	1	2	3	4
18. I feel confused .....	1	2	3	4
19. I feel steady .....	1	2	3	4
20. I feel pleasant .....	1	2	3	4

Appendix J  
Information Letter (Chinese Version)

研究說明信

研究主題:影響接受生殖科技婦女壓力之因素

妳好！我的名字叫王瑤華，目前是美國德州大學奧斯汀分校護理博士候選人。我想邀請你參加我博士論文的研究。這個研究只需填寫三次問卷，研究結果將提供醫護人員規劃照顧接受生殖科技婦女的參考。我的論文指導教授是 Penticuff 博士。妳被邀請參加此一研究是因為妳決定接受生殖科技治療，已婚，年齡介於 20 到 50 歲之間。我竭誠的邀請妳參加此一研究。約有 85 位婦女會參加本研究，妳是當中的一位。

如果妳同意參加本研究，我將在妳候診時回答妳關於參加本研究相關的問題。如果妳決定參加本研究，妳將會收到關於接受生殖科技之壓力的問卷。妳需要填寫相關問卷三次。第一次問卷的填寫是在妳接受陰道超音波檢查後，第二次是在接受胚胎植入後 3-4 小時中間，第三次問卷的填寫是在妳回院接受抽血檢驗懷孕結果時。妳可以在候診及方便時填答這些問卷，每次填答的時間約需 30-35 分鐘。在第一次填答時妳還須填寫一份簡單的個人資料，填寫時間約需 2-3 分鐘。最後還需追蹤妳懷孕測試的結果。所有的問卷均採匿名編碼方式處理以注重你個人隱私的保護。

妳所填答得的資料將會絕對保密，惟有獲得妳同意後才會公開。妳的名字將不會出現在任何問卷或將來的書面或口頭研究報告上。妳的同意書，填答的問卷及編碼表將上鎖以確保妳的隱私，惟有我可以查閱這些資料。

對於問卷內容若有任何疑問歡迎妳與我討論。妳可跳過不想回答的問題或停止回答問卷。參與本研究並不需任何花費，但妳所提供的資料將非常有助醫護人員瞭解婦女接受生殖科技治療時的需要。爲了答謝妳的參與研究，當你回答完問卷將獲得一份小禮物。

妳的決定參與研究與否將不會影響妳目前或將來與台灣聯合試管嬰兒中心的關係，也不會影響妳接受醫療的權利。若研究過程中你有任何疑問，請參照下列電話或地址隨時與我或我的指導教授 Penticuff 博士聯絡。我們將會非常樂意解答妳的問題。

若妳同意參與，請寄回隨函附上的回郵明信片。若研究過程中你有任何疑問，請打以下的電話，或寫信到下列地址給我或我的指導教授 Penticuff 博士。我們將會非常樂意回答妳的問題。

王瑤華

美國德州大學奧斯汀分校護理博士班學生

國立成功大學護理系講師

台南市大學路一號

電話:06-2353535, 分機 5847

或

Joy H. Penticuff, 博士

美國德州大學奧斯汀分校護理學院

1700 Red River, Austin, Texas 78701-1499

電話: 002-1-512-471-9087

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參加者全名

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簽名

日期

Appendix K  
Consent Form (Chinese Version)

同意函

研究主題：影響接受生殖科技婦女壓力之因素

這封信是邀請妳參加一項關於影響台灣婦女接受生殖科技壓力因素的研究。我的名字叫王瑤華，目前是美國德州大學奧斯汀分校護理博士候選人。這個研究是我的博士論文，我的論文指導教授是 Penticuff 博士。我的論文主要在探討影響台灣婦女接受生殖科技壓力之因素，研究結果將提供醫護人員規劃照顧接受生殖科技婦女的參考。因為妳先前寄回的明信片上表達妳參加本研究的意願，因此我竭誠的邀請妳參加此一研究。約有 85 位婦女會參加本研究，妳是當中的一位。

如果妳同意參加本研究，我將在妳候診時回答妳關於參加本研究相關的問題。如果妳決定參加本研究，妳將會收到關於接受生殖科技之壓力的問卷。妳需要填寫相關問卷三次。第一次問卷的填寫是在妳接受陰道超音波檢查後，第二次是在接受胚胎植入後 3-4 小時中間，第三次問卷的填寫是在妳回院接受抽血檢驗懷孕結果時。妳可以在候診及方便時填答這些問卷，每次填答的時間約需 30-35 分鐘。在第一次填答時妳還須填寫一份簡單的個人資料，填寫時間約需 2-3 分鐘。最後還需追蹤妳懷孕測試的結果。所有的問卷均採匿名編碼方式處理以注重你個人隱私的保護。

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對於問卷內容若有任何疑問歡迎妳與我討論。妳可跳過不想回答的問題或停止回答問卷。參與本研究並不需任何花費，但妳所提供的資料將非常有助醫護人員瞭解婦女接受生殖科技治療時的需要。為了答謝妳的參與研究，當你回答完問卷將獲得一份小禮物。

妳的決定參與研究與否將不會影響妳目前或將來與台灣聯合試管嬰兒中心的關係，也不會影響妳接受醫療的權利。若研究過程中你有任何疑問，請參照下列電話或地址隨時與我或我的指導教授 Penticuff 博士聯絡。我們將會非常樂意解答妳的問題。

妳的簽名表示妳閱讀過上述的內容並且同意參加本研究。妳將會獲得這份同意書的影本。非常感謝你的支持與參與。祝凡事順利，心想事成。

王瑤華  
美國德州大學奧斯汀分校護理博士候選人  
國立成功大學護理系講師  
台南市大學路一號  
電話:092-992-1020  
或  
Joy H. Penticuff, 博士  
美國德州大學奧斯汀分校護理學院  
1700 Red River, Austin, Texas 78701-1499  
電話: 002-1-512-471-9087

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參加者全名

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參加者簽名

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日期

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研究者簽名

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日期

Appendix L  
**Personal Information Form (Chinese Version)**  
個人基本資料

代碼\_\_\_\_\_

出生日期: \_\_\_\_年\_\_\_\_月\_\_\_\_ 填表日期: \_\_\_\_年\_\_\_\_月\_\_\_\_

最高教育程度

\_\_\_\_小學      \_\_\_\_國中      \_\_\_\_高中  
\_\_\_\_職校      \_\_\_\_專科      \_\_\_\_二技  
\_\_\_\_大學      \_\_\_\_研究所

宗教信仰

\_\_\_\_佛教      \_\_\_\_道教      \_\_\_\_基督教      \_\_\_\_天主教  
\_\_\_\_其它\_\_\_\_\_      \_\_\_\_無

你嘗試懷孕有多久? \_\_\_\_年\_\_\_\_月

目前有幾個小孩?

\_\_\_\_無  
\_\_\_\_有; 男\_\_\_\_個 女\_\_\_\_個, 年齡:\_\_\_\_\_

你知道你不孕的診斷嗎?

\_\_\_\_知道      診斷\_\_\_\_\_  
\_\_\_\_不知道

你過去接受過的不孕症治療名稱及次數?

\_\_\_\_誘發排卵; 次數\_\_\_\_次      \_\_\_\_人工受精; 次數\_\_\_\_次  
\_\_\_\_試管嬰兒; 次數\_\_\_\_次      \_\_\_\_配子輸卵管植入; 次數\_\_\_\_次  
其它\_\_\_\_\_ ; 次數\_\_\_\_次

這是你最後一次試管嬰兒治療嗎? 否\_\_, 是\_\_\_\_

若是, 則原因為何?

治療費用\_\_\_\_ 壓力\_\_\_\_ 不方便\_\_\_\_  
計劃領養\_\_\_\_ 其它\_\_\_\_\_

Appendix M  
Infertility-Specific Distress Scale (Chinese Version)

不孕壓力量表

以下有五題關於你生活的敘述你可會同意或不同意。請仔細閱讀各題並在旁邊的空格中填入適當數字。請填入最符合你在過去一週中感受的程度的數字。請使用以下的量表來回答問題。

1	2	3	4	5	6	7
非常不同意						非常同意

1. \_\_\_\_ 我的生活在許多方面接近理想狀況
2. \_\_\_\_ 我的生活狀況極佳
3. \_\_\_\_ 我很滿意我的生活
4. \_\_\_\_ 目前為止我已得到生命中重要的東西
5. \_\_\_\_ 如果能再活一次，我會過同樣的生活

請就過去一週內您對不孕的感受，在前面的空格內填選適當的數字。請使用以下的量表。

1	2	3	4	5
完全不像 我的感受	有點像 我的感受	像我的 感受	非常像 我的感受	完全如同 我的感受

- |            |              |              |
|------------|--------------|--------------|
| ____ 1. 空虛 | ____ 8. 自信   | ____ 15. 傷心  |
| ____ 2. 快樂 | ____ 9. 滿足   | ____ 16. 挫折感 |
| ____ 3. 憂鬱 | ____ 10. 失望  | ____ 17. 不耐煩 |
| ____ 4. 樂觀 | ____ 11. 被遺忘 | ____ 18. 有活力 |
| ____ 5. 孤單 | ____ 12. 能幹  | ____ 19. 憂慮  |
| ____ 6. 生氣 | ____ 13. 安全  | ____ 20. 愉快  |
| ____ 7. 驕傲 | ____ 14. 勝任的 |              |



Appendix N  
Taita Symptom Checklist (Chinese Version)  
台大症狀量表

說明:

下列為人們常見的問題。請仔細閱讀每一題，並就過去一個月以來(含作答日)你曾經歷下列症狀的程度，圈選應對的數字。每一題請僅圈選一個數字，並請逐題作答，勿漏答任一題。謝謝！

您感覺壓力的程度	沒有	輕度	中度	強度	極度
1. 覺得身體麻木或刺痛 .....	0	1	2	3	4
2. 全身倦怠，容易疲倦 .....	0	1	2	3	4
3. 肌肉酸痛或腰酸背痛 .....	0	1	2	3	4
4. 翻胃或胃不好 .....	0	1	2	3	4
5. 頭痛 .....	0	1	2	3	4
6. 胸部疼痛或心臟痛 .....	0	1	2	3	4
7. 為求完美而做事緩慢 .....	0	1	2	3	4
8. 擔心算錯數目而反覆計算 .....	0	1	2	3	4
9. 保持整齊清潔，不能有一點髒亂 .....	0	1	2	3	4
10. 對已完成的事沒把握，須反覆查看 .....	0	1	2	3	4
11. 某念頭或字眼盤據心中揮之不去 .....	0	1	2	3	4
12. 做事情時不容易下決定 .....	0	1	2	3	4
13. 與別人相處，被注視或被談論時會覺得 不自在 .....	0	1	2	3	4
14. 注意力不集中 .....	0	1	2	3	4
15. 大家不瞭解、不同情或不喜歡妳 .....	0	1	2	3	4
16. 不敢與別人，尤其是異性，雙目對視 .....	0	1	2	3	4
17. 覺得處處不如別人或常後悔自己言行 .....	0	1	2	3	4
18. 睡不深，常作夢 .....	0	1	2	3	4
19. 憂鬱、煩躁、寂寞或容易哭泣 .....	0	1	2	3	4
20. 覺得悲觀，前途渺茫或自己沒有價值 .....	0	1	2	3	4
21. 對任何事包括性在內都提不起興趣 .....	0	1	2	3	4

您感覺壓力的程度	沒有	輕度	中度	強度	極度
22. 理解力，記憶力減退 .....	0	1	2	3	4
23. 頭暈、頭重腳輕 .....	0	1	2	3	4
24. 感覺被人注視著或談論著 .....	0	1	2	3	4
25. 心蹦蹦跳或呼吸困難 .....	0	1	2	3	4
26. 緊張惶恐，坐立不安 .....	0	1	2	3	4
27. 彷彿大禍臨頭，心中陣陣害怕或惶恐 .....	0	1	2	3	4
28. 全身發抖 .....	0	1	2	3	4
29. 做事情時有壓迫感 .....	0	1	2	3	4
30. 有衝動想要打或傷害某人 .....	0	1	2	3	4
31. 做事不順利時喜歡喝酒 .....	0	1	2	3	4
32. 常與別人起爭論 .....	0	1	2	3	4
33. 喜歡用武力解局決事情 .....	0	1	2	3	4
34. 脾氣暴躁，易被激怒而失去控制 .....	0	1	2	3	4
35. 想大吼大叫或摔東西 .....	0	1	2	3	4
36. 不敢搭乘電梯 .....	0	1	2	3	4
37. 自己一個人時會覺得不安 .....	0	1	2	3	4
38. 在人擁擠處，如車站或百貨公司， 會覺得心神不定 .....	0	1	2	3	4
39. 不敢搭程器車或火車 .....	0	1	2	3	4
40. 在大街或郊外空曠地方會覺得害怕 .....	0	1	2	3	4
41. 因懼怕而不得不逃避某些活動或地方 .....	0	1	2	3	4
42. 覺得與人相處時自我意識很高 .....	0	1	2	3	4
43. 覺得身體有嚴重的毛病 .....	0	1	2	3	4
44. 認為自己的心理有問題 .....	0	1	2	3	4

Appendix O  
**Ways of Coping Questionnaire (Chinese Version)**

因應行為反應量表

請回想一下，自上週以來，你對接受生殖科技治療的反應，請針對這整件事情來回答下面的問題，並請在「從未如此(0)、偶而如此(1)、經常如此(2)、總是如此(3)」四個選項中，圈選你覺得最接近的一項；如果在這件事情中，你從來沒有過某種反應或作法，就請選「從未」。請不要遺漏了任何一題。

從 偶 經 總

未 而 常 是

- 0 1 2 3 1. 集中注意在我下一步該做什麼
- 0 1 2 3 2. 分析這件事以便深入瞭解它。
- 0 1 2 3 3. 藉投入工作或其它事物而不去理會這件事。
- 0 1 2 3 4. 時間會改變一切，唯一要做的就是等待。
- 0 1 2 3 5. 爭取我應有的權益。
- 0 1 2 3 6. 做一些連我自己都不認為對於事情解決會有幫助的事，但是我至少做了些什麼。
- 0 1 2 3 7. 試著要造成這個問題的人改變他(她)的想法。
- 0 1 2 3 8. 跟某個人談談，以便對情況有更多的了解。
- 0 1 2 3 9. 批評或責備我自己。
- 0 1 2 3 10. 只讓人家知道事情的大概，以免斷了自己的後路。
- 0 1 2 3 11. 希望奇蹟出現。
- 0 1 2 3 12. 跟著命運走；有時候我只是運氣不好而已。
- 0 1 2 3 13. 照樣過日子，就像沒發生過任何事一樣。
- 0 1 2 3 14. 我嘗試著把自己的感受留在心裏。
- 0 1 2 3 15. 試著去看事情的光明面。
- 0 1 2 3 16. 睡得比平常多。
- 0 1 2 3 17. 對造成這個問題的人表達我的氣憤。
- 0 1 2 3 18. 從某個人那裏得到同情與了解。
- 0 1 2 3 19. 既然改變不了事實，只好逆來順受。

從偶經總

未而常是

- 0 1 2 3 20.得到靈感去做一些有創意的事。
- 0 1 2 3 21.試著把整件事情忘掉。
- 0 1 2 3 22.得到專業輔導人員的幫助。
- 0 1 2 3 23.認為這次的事件可以使我朝好的方向去改變或成長。
- 0 1 2 3 24.向問題有關的人表達我的不滿。
- 0 1 2 3 25.我道歉或做一些補救措施。
- 0 1 2 3 26.我訂了一個行動計劃，並且照著去做。
- 0 1 2 3 27.退而求其次。
- 0 1 2 3 28.好歹我發洩了我的情緒。
- 0 1 2 3 29.領悟到問題是我自己帶來的。
- 0 1 2 3 30.我想我經歷過這個事件後，會比未經歷前更長進。
- 0 1 2 3 31.找一個能對這個問題提出具體意見的人談一談。
- 0 1 2 3 32.做一些對解決問題沒有幫助，但是讓自己覺得舒服一點的事。
- 0 1 2 3 33.藉著吃東西、抽煙讓自己覺得好過一點。
- 0 1 2 3 34.大膽一試，或做一些很冒險的事情。
- 0 1 2 3 35.我試著不要太冒然或憑著直覺來行動。
- 0 1 2 3 36.經過這件事，我找到了新的信心。
- 0 1 2 3 37.下定決心維持自我價值感。
- 0 1 2 3 38.經過這件事，我再次發現什麼是生命中重要的東西。
- 0 1 2 3 39.改變某些事情，使情況好轉。
- 0 1 2 3 40.避免和人們接觸。
- 0 1 2 3 41.不讓事情影響我，不要想太多。
- 0 1 2 3 42.向一個我敬佩的親人或朋友請教。
- 0 1 2 3 43.不讓他人知道事情有多糟。
- 0 1 2 3 44.把事情看淡，不要對它太認真。
- 0 1 2 3 45.向某個人述說我的感受。
- 0 1 2 3 46.站穩我的立場，爭取我所要的。

從偶經總

未而常是

- 0 1 2 3 47.向不相關的人發洩。
- 0 1 2 3 48.利用過去的經驗--我以前有過類似的處境。
- 0 1 2 3 49.我知道該做什麼，所以加倍努力，讓事情做得好。
- 0 1 2 3 50.拒絕相信事情已經發生了。
- 0 1 2 3 51.我向我自己許諾，下次的情況會不一樣。
- 0 1 2 3 52.針對問題想出幾個不同的解決方法。
- 0 1 2 3 53.我知道做什麼都沒用，不如平心靜氣的接受。
- 0 1 2 3 54.我試著不讓我的感受太干擾到其他事情。
- 0 1 2 3 55.把我的情緒發洩在不相干的人或事上。
- 0 1 2 3 56.我自己有了一些改變。
- 0 1 2 3 57.做夢或想美好事物，讓自己感覺較好。
- 0 1 2 3 58.希望問題情況會自然消失或解決。
- 0 1 2 3 59.對事情的結果心存幻想。
- 0 1 2 3 60.我禱告上帝或祈求神明。
- 0 1 2 3 61.我努力調整自己身體以應付治療的需要。
- 0 1 2 3 62.我在心裏反覆思考我想要說或做的事。
- 0 1 2 3 63.我假想一個我佩服的人，會怎麼處理這些情況，並以此作為借鏡。
- 0 1 2 3 64.我試著以旁觀者的角度來看待這件事。
- 0 1 2 3 65.想想「塞翁失馬，焉知非福」，就不計較了。
- 0 1 2 3 66.發洩情緒，例如：哭泣。

再次謝謝你的費心作答！

Appendix P  
**Dyadic Adjustment Scale (Chinese Version)**

婚姻調適量表

在婚姻關係中，很多人都會與配偶對一些事情有不同的看法。請就著第 1 至 15 題所列出的項目，根據你們倆對它們的看法之一致程度，在每一個項目中將一個你認為最適切的答案告訴我。

	幾乎 總是一致	幾乎 總是一致	偶爾 不一致	經常 不一致	幾乎總 是不一致	總是 不一致	
	5	4	3	2	1	0	
1. 家庭財政的處理 .....	5	4	3	2	1	0	
2. 娛樂活動 .....	5	4	3	2	1	0	
3. 宗教信仰 .....	5	4	3	2	1	0	
4. 情愛的表示 .....	5	4	3	2	1	0	
5. 朋友 .....	5	4	3	2	1	0	
6. 性關係 .....	5	4	3	2	1	0	
7. 傳統觀念和習慣 (正確和和宜的 行為) .....	5	4	3	2	1	0	
8. 人生觀 .....	5	4	3	2	1	0	
9. 與父母 / 姻親相處的方式 .....	5	4	3	2	1	0	
10. 目的、目標和認為重要的事物 .....	5	4	3	2	1	0	
11. 共同相處時間的多寡 .....	5	4	3	2	1	0	
12. 作出重要決定 .....	5	4	3	2	1	0	
13. 家務工作 .....	5	4	3	2	1	0	
14. 餘暇嗜好和活動 .....	5	4	3	2	1	0	
15. 有關職業的決定 .....	5	4	3	2	1	0	

請按著你覺得這些事情出現的頻繁程度，圈選你認為最能夠代表你們關係的答案。

- |   | 大部份  |      |      |     |     |      |
|---|------|------|------|-----|-----|------|
|   | 一直都有 | 時間都有 | 經常都有 | 偶爾有 | 很少有 | 從來沒有 |
|   | 0    | 1    | 2    | 3   | 4   | 5    |
| 16. 你有沒有與配偶討論或曾經考慮離婚，分居或終止你們之間的關係?..... | 0    | 1    | 2    | 3   | 4   | 5    |
| 17. 你或你的配偶有沒有在爭吵或打架後離家而去?.....          | 0    | 1    | 2    | 3   | 4   | 5    |
| 18. 一般來說，你有多少時候認為你們夫婦間的關係是好的?.....      | 0    | 1    | 2    | 3   | 4   | 5    |
| 19. 你是否信賴你的配偶?.....                     | 0    | 1    | 2    | 3   | 4   | 5    |
| 20. 你曾否後悔結婚? .....                      | 0    | 1    | 2    | 3   | 4   | 5    |
| 21. 你和你的配偶有多少時候會吵架?.....                | 0    | 1    | 2    | 3   | 4   | 5    |
| 22. 你和你的配偶有多少時候會令對方發火?.....             | 0    | 1    | 2    | 3   | 4   | 5    |
| 23. 你有沒有親吻你的配偶?                         |      |      |      |     |     |      |
| __4-每天都有                                |      |      |      |     |     |      |
| __3-差不多每天都有                             |      |      |      |     |     |      |
| __2-偶爾有                                 |      |      |      |     |     |      |
| __1-很少有                                 |      |      |      |     |     |      |
| __0-從來沒有                                |      |      |      |     |     |      |
| 24. 你和你的配偶有沒有一同外出進行社交或興趣活動? (請勾一項)      |      |      |      |     |     |      |
| __4-所有的活動都是一起進行的                        |      |      |      |     |     |      |
| __3-大部份的活動是一起進行的                        |      |      |      |     |     |      |
| __2-部份的活動是一起進行的                         |      |      |      |     |     |      |
| __1-很少部份的活動是一起進行的                       |      |      |      |     |     |      |
| __0-沒有任何活動是一起進行的                        |      |      |      |     |     |      |

你認為在你們夫婦之間，有多少時候會出現下列的情況？請告訴我最能代表你的感受的答案。？

25. 有啟發性或激勵性的意見交換

\_\_0-從來沒有                      \_\_1-少於每月一次                      \_\_2-每月一或二次  
\_\_3-每週一或二次                      \_\_4-每天一次                      \_\_5-每天數次

26. 一起歡笑

\_\_0-從來沒有                      \_\_1-少於每月一次                      \_\_2-每月一或二次  
\_\_3-每週一或二次                      \_\_4-每天一次                      \_\_5-每天數次

27. 冷靜地討論一些事情

\_\_0-從來沒有                      \_\_1-少於每月一次                      \_\_2-每月一或二次  
\_\_3-每週一或二次                      \_\_4-每天一次                      \_\_5-每天數次

28. 一起進行一件事或一個計畫

\_\_0-從來沒有                      \_\_1-少於每月一次                      \_\_2-每月一或二次  
\_\_3-每週一或二次                      \_\_4-每天一次                      \_\_5-每天數次

夫婦間在某些事情上會有時意見一致，但有時會持不同的意見。請告訴我在過去數個星期內，以下的事情曾否引發你們夫婦間有不同的意見，或這些事情已經成為你們婚姻關係中的問題？(請勾選是或否)

29. 疲倦得不想有性行為，是-1\_\_                      否-0\_\_

30. 沒有向對方表示愛意，是-1\_\_                      否-0\_\_

31. 在以下的直線上的每一點是代表著你從婚姻關係中可能感受到的不同程度之快樂。中間點「快樂」是代表大多數夫婦能從他們婚姻關係中所感受到的快樂程度。請你考慮所有有關因素後，指出最能代表你們夫妻關係快樂程度的數字。

0	1	2	3	4	5	6
極度 不快樂	頗為 不快樂	少許 不快樂	快樂	很快樂	極度 快樂	完美



32. 你認為以下那一句子最能夠形容你對你們夫妻關係的將來的感受? (請選擇一項)
- 5 我極度渴望這段婚姻關係能夠成功，我亦會竭盡所能去令它成功
  - 4 我極希望這段婚姻關係能夠成功，我亦會盡力去令它成功
  - 3 我極希望這段婚姻關係能夠成功，我亦會做我份內應做的去令它成功
  - 2 如果這段婚姻關係能夠成功是好的，但我不能再做得比現在更多去促使它成功
  - 1 如果這段婚姻關係能夠成功是好的，但我拒絕再做得比現在更多去維繫這段關係
  - 0 這段婚姻關係是永遠不能成功的，而且再沒有什麼我可以做去維繫這段關係

Appendix Q  
**Personal Resource Questionnaire 85 Part II (Chinese Version)**

個人資源問卷表

說明：以下這些敘述，有些人同意這樣的說法，有些人則不同意。任何一個敘述都沒有對或錯的答案。請在每個敘述上圈選您認為最適合的答案。

1=非常不同意      2=不同意      3=有一點點不同意      4=沒意見  
 5=有一點點同意      6=同意      7=非常同意

- |                                       |   |   |   |   |   |   |   |
|---------------------------------------|---|---|---|---|---|---|---|
| 1. 我有親近的人而且他們讓我覺得<br>可以依靠 .....       | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. 我和別人在一起的團體中，我感<br>覺自己是重要的 .....    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. 別人認為我將份內的工作做的很<br>好(例如工作家事) .....  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. 我無法依靠我的親戚或朋友幫助<br>我解決困難 .....      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. 我會常常和讓我感到自己是特別<br>的人在一起 .....      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. 我會找時間與和我有相同興趣的<br>人在一起 .....       | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. 在我的生活中很少有機會幫助或<br>照顧別人 .....       | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. 有人告訴我他們喜歡和我一起做<br>事 .....          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. 假如我需要一段長時間的幫忙，<br>我可以找到人來幫助我 ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. 沒有人可以和我討論我的感受 .....               | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. 我和朋友 之間會互相幫忙 .....                | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. 我會鼓勵別人發展他們的興趣<br>和技能 .....        | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1=非常不同意      2=不同意      3=有一點點不同意      4=沒意見  
5=有一點點同意      6=同意      7=非常同意

- |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 13. 我的家人認為我對維持家庭生<br>活的運作很重要 .....        | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. 我有一些親戚或朋友會願意無<br>條件幫助我 .....          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. 當我心情不好時有人可以和我<br>在一起而且讓我感到很自在 .....   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. 我覺得我遇到的問題都和別人<br>很不一樣 .....           | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. 我喜歡做一些特別的事情讓別人<br>更加快樂 .....          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. 我感到有欣賞我 .....                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. 有人很關心我 .....                          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. 有人可以和我分享一些社會上發生的事<br>情和生活上有趣味的事 ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. 我應該幫助別人的需要 .....                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. 假如我需要建議時有人會提供我意見而<br>且幫助我處理這件事情 ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. 我覺得別人需要我 .....                        | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. 別人認為我沒有做到一個朋友(或鄰居)<br>應該做的那樣好 .....   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. 假如我生病了，有人會給我意見教我<br>如何照顧我自己 .....     | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix R  
State Anxiety Inventory (Chinese Version)

情境焦慮量表

作答說明：下面有一些人們用來描述自己的語句，作答時，先看各題的語句，然後根據你現在的感受——也就是這個時刻的感受，在右方適當的答案處圈選。答案並沒有對錯之別，只要選出最能說明你目前的答案即可，不必在每一題上花太多時間。

<u>一點也不</u>	<u>有一點</u>	<u>頗為</u>	<u>非常</u>	
1	2	3	4	
1. 我覺得鎮靜.....	1	2	3	4
2. 我覺得安全.....	1	2	3	4
3. 我覺得緊張.....	1	2	3	4
4. 我後悔.....	1	2	3	4
5. 我覺得輕鬆自在.....	1	2	3	4
6. 我覺得不如意.....	1	2	3	4
7. 我現在就會為可能發生的不幸 而擔憂.....	1	2	3	4
8. 我覺得安閒.....	1	2	3	4
9. 我覺得焦慮.....	1	2	3	4
10. 我覺得舒適.....	1	2	3	4
11. 我覺得有自信.....	1	2	3	4
12. 我覺得焦急.....	1	2	3	4
13. 我覺得神經過敏.....	1	2	3	4
14. 我覺得神經緊張.....	1	2	3	4
15. 我覺得舒暢.....	1	2	3	4
16. 我覺得滿足.....	1	2	3	4
17. 我擔憂.....	1	2	3	4
18. 我覺得太激動而且急躁不安.....	1	2	3	4

<u>一點也不</u>	<u>有一點</u>	<u>頗為</u>	<u>非常</u>				
1	2	3	4				
19. 我覺得高興.....	1	2	3	4			
20. 我覺得愉快.....	1	2	3	4			

Appendix S  
Permission Letter

----- Original Message -----

**From:** Annette Stanton

**To:** 'Yao-Hua Wang'

**Sent:** Sunday, April 22, 2001 2:39 AM

**Subject:** RE: request

Please consider this note permission to use the Infertility-Specific Distress and Well-being scale. Relevant references are below.

Other researchers have used the scale, but I am not aware of other relevant publications. Best wishes with your research. I would appreciate learning of your findings.

Annette L. Stanton, Ph.D.  
Professor and Director, Graduate Specialty in Clinical Health Psychology  
Department of Psychology  
426 Fraser Hall  
University of Kansas  
Lawrence, KS 66045-2160  
(785) 864-9804 phone  
(785) 864-5696 fax  
[astanton@ukans.edu](mailto:astanton@ukans.edu)

Appendix T  
Permission Letter

----- Original Message -----

**From:** Stanton, Annette  
**To:** 'Yao-Hua Wang'  
**Sent:** Monday, November 12, 2001 7:45 AM  
**Subject:** RE: permission

Hi, I would be happy to give you permission to translate the scale into Chinese. ALS

Annette L. Stanton, Ph.D.  
Professor and Director, Graduate Specialty in Clinical Health Psychology  
Department of Psychology  
426 Fraser Hall  
University of Kansas  
Lawrence, KS 66045-2160  
Phone: (785) 864-9804  
Fax: (785) 864-5696  
email: [astanton@ku.edu](mailto:astanton@ku.edu)

Appendix U  
Permission Letter

----- Original Message -----

From: <[SFolkman@psg.ucsf.edu](mailto:SFolkman@psg.ucsf.edu)>

To: <[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu)>

Sent: Friday, January 26, 2001 12:04 PM

Subject: RE: request for permission

Permission is granted. (The WOC is in the public domain, so permission is not actually required.) I have a Chinese translation of the WOC. Would this be helpful? .

-----Original Message-----

From: Yao-Hua Wang [SMTP:[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu)]

Sent: Friday, January 26, 2001 7:50 AM

To: [sfolkman@psg.ucsf.edu](mailto:sfolkman@psg.ucsf.edu)

Subject: request for permission

Dr. Folkman:

My name is Yao-Hua Wang. I am studying at the doctoral program in the University of Texas at Austin School of Nursing. My dissertation topic is related to Taiwanese women's coping with the stress of receiving assisted reproductive technology. I plan to collect data in Taiwan in September 2001. When I searched for the appropriate instrument to measure the coping I found that you have developed the Ways of Coping checklist. After reviewing your studies I think that your instrument is appropriate for me to examine the coping variable in my study. Therefore I would like to request your permission to allow me to use the Ways of Coping checklist.

Thank you very much.

Yao-Hua Wang, PhD Program

The University of Texas at Austin

School of Nursing

[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu) <<mailto:yhwang@mail.utexas.edu>>

(512)479-6-72



Appendix V  
Permission Letter

----- Original Message -----

From: "魏世台( Shih-tai Wei)" <[shihtaiw@tpts5.seed.net.tw](mailto:shihtaiw@tpts5.seed.net.tw)>

To: "Yao-Hua Wang" <[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu)>

Sent: Thursday, March 08, 2001 12:09 PM

Subject: Fw: request for permission

Hi! Yao-Hua,

I got a mail from Dr. Folkman and she mentioned that she recommended you to use the Chinese version of WOC.

Just like you, I found the Contextual model of coping is a well constructed model when I was working on my dissertation several years ago. According to the culture differences, I have added some items based on two pilot studies.

Interestingly, some similar factors or components are extracted as some cultural differences are identified.

The citation for the Chinese WOC should be "Wei, S. T. (1997). Perceived parenting patterns and adolescents' coping styles in Chinese culture. Published doctoral dissertation, University of Northern Colorado."

If you need more information, please feel free to contact with me.

Shih-tai Wei ( 魏世台 )

[Shihtaiw@tpts5.seed.net.tw](mailto:Shihtaiw@tpts5.seed.net.tw)

Appendix W  
Permission Letter

----- Original Message -----

From: "Daniel Shek" <[danielshek@cuhk.edu.hk](mailto:danielshek@cuhk.edu.hk)>

To: "Yao-Hua Wang" <[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu)>

Sent: Monday, December 18, 2000 7:20 PM

Subject: Re: request

At 12:28 AM 2000/12/18 -0600, you wrote:

Dr. Shek:                   the Chinese version Dyadic Adjustment  
Scale.                   Thank you for your time. Yao-Hua Wang, PhD  
Program

The University of Texas at Austin School of Nursing  
[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu) (512)479-6-72

\*\*\* Please write a formal letter to me, countersigned by your supervisor.  
In the letter, you should clearly state the purpose of the research and  
that the scale will not be used for commercial use.

Daniel Shek

Appendix X  
Permission Letter

----- Original Message -----

From: "Weinert, Clarann" <[cweinert@montana.edu](mailto:cweinert@montana.edu)>

To: "Yao-Hua Wang" <[yhwang@mail.utexas.edu](mailto:yhwang@mail.utexas.edu)>

Sent: Wednesday, May 09, 2001 2:35 PM

Subject: RE: permission request

Yao-Hua Wang,

Thank you for your interest in the PRQ. I will be happy to send you the packet of information. We do have a Chinese version. It may save you some time.

Clarann Weinert

Clarann Weinert, SC,PhD,RN,FAAN

Professor

Director of the College of Nursing Office of Research

Montana State University - Bozeman

College of Nursing

Bozeman, MT 59717

(406) 994 6036 or 2782

FAX (406) 994 6020

[www.montana.edu/cweinert](http://www.montana.edu/cweinert)

Appendix Y  
Permission Letter

----- Original Message -----

**From:** [hhwang](#)

**To:** [Yao-Hua Wang](#)

**Sent:** Thursday, December 20, 2001 12:59 AM

**Subject:** Re: permission request

王老師:

我同意您使用中文版之 PRQ 85 Part II 。

Good luck !

王秀紅

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