

**Anxiety, Depression, Stress and Trauma in couples attending an  
Assisted Conception Unit and reasons for their reluctance to  
participate in a Stress Management Program**

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## **DECLARATION**

“I certify that this is a true and accurate account of the work carried out. This thesis has been composed by myself and the work herein is my own”.

Signed.

**Nicola Jayne Smart**

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## **ABSTRACT**

### **Anxiety, depression, stress and trauma in couples attending an Assisted Conception Unit and reasons for their reluctance to participate in a stress management program**

**Introduction:** Infertility has a major impact on the emotional well being of a couple. As many as one quarter of couples could experience some delay in starting a family (Green and Vassey, 1990). However, many of these couples are reluctant to attend therapy sessions intended to help them with the stresses involved in experiencing infertility.

**Objectives:** To investigate the levels of anxiety, depression, stress and trauma in couples attending an Assisted Conception Unit (ACU) compared to the general population and to investigate the ACU patients' reluctance to participate in a Clinical Psychologist-led stress management group.

**Design:** A between subjects design was employed to compare results from participants attending an ACU to a matched control group from the general population. Members of the control group were matched for age, gender, relationship status and level of qualifications with individual ACU participants.

**Methods:** All subjects were invited to complete a short questionnaire consisting of assessments of anxiety, depression, stress and trauma along with demographic questions. Couples attending the ACU were also asked to complete a questionnaire designed specifically for this study to elicit their reasons for non-participation in a stress management program.

**Results:** As hypothesised the results indicate that the ACU group was more stressed than the general population and that the women in this group appeared to be more severely affected. Their reasons for reluctance to participate in stress management varied as a function of the distress levels experienced. All results are discussed in relation to previously published findings.

**Conclusions:** Although the experience of infertility is stressful infertile couples are reluctant to attend stress management groups. The introduction of any psychosocial intervention should take these findings into consideration. Clinical implications and suggestions for future research are discussed.

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# **CHAPTER ONE**

## **INTRODUCTION**

## 1.1 GENERAL INTRODUCTION

The World Health Organisation defines infertility as the failure of a couple to establish a pregnancy after 1 year of coitus without using contraception (WHO, 2000). As many as one-quarter of all couples could experience some delay in starting a family (Green and Vassey, 1990); thus, infertility affects a significant proportion of the younger clients of any general practitioner. The research literature suggests that being able to start a family is crucial to many couples' sense of self and how they present themselves to the world. As a consequence infertility can have a significant impact on a couples' psychological well-being (Mazure et al, 1992). Infertility, treatment with reproductive technologies and abortion are among the most emotionally weighted and philosophically contentious experiences in most patients' lives. They involve "the most intimate body parts and behaviours and the most heartfelt hopes and profound disappointments" (Scotland, 2002). A large proportion of the research examining psychological factors in infertility has focused on depression and stress in the female partner. Recent studies have become more interested in the impact of infertility on the male partner also and, to a lesser extent, on the occurrence of anxiety and psychological intrusions and avoidance symptoms in these couples.

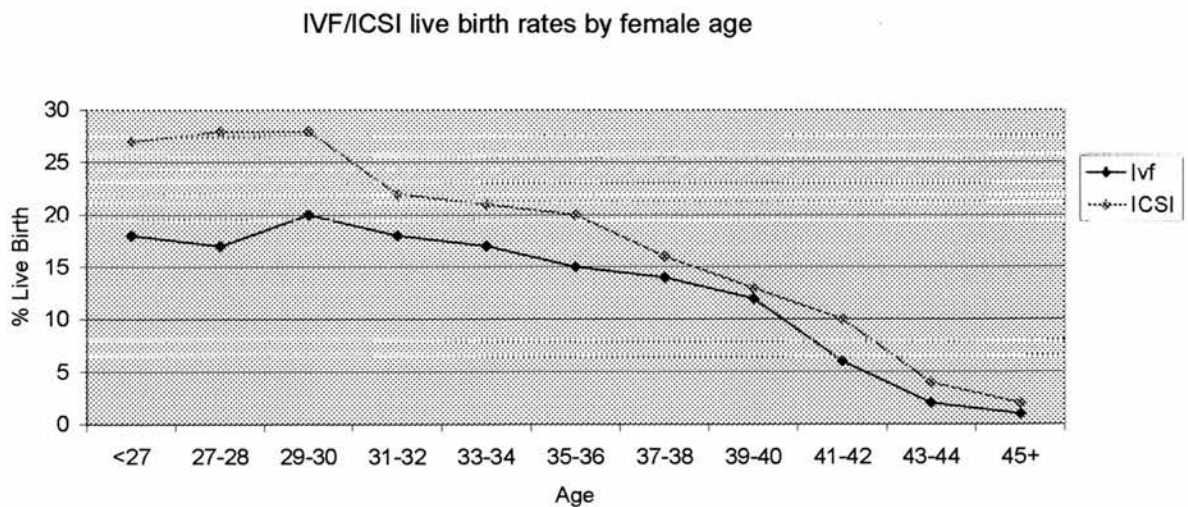
In the introduction to this study, general issues relating to infertility, NHS provisions for treatment of infertile couples within the UK and specific medical categories of infertility will be explored. The relationship between infertility and psychological factors such as anxiety, depression, stress and psychological intrusions and avoidance symptoms will also be examined in the present study. In addition, current literature and theoretical perspectives relating to psychological interventions will be outlined.

## 1.2 ASSISTED CONCEPTION

### 1.2.1 Background

Reports vary significantly in their estimation of the prevalence of infertility. Some reports suggest that approximately 15 percent of couples are infertile (Morrow et al, 1995). Other reports have suggested that up to one quarter of all couples could experience some delay at some stage in producing a family (Green and Vassey, 1990).

The rate of infertility has increased over the past 25 years. This is possibly in response to several factors. Firstly, there has been an increase in sexually transmissible infections, which may in part be associated with the increased use of non-barrier methods of contraception. Secondly, societal changes are beginning to take place in which infertility is discussed more openly. This has been accompanied by a widespread publicity of new methods for achieving fertility among infertile couples. Thirdly, there is also now a trend for deferral of childbearing until later in life and female fertility is known to decrease significantly after age 35 (TeVelde & Pearson, 2002). Figure 1 clearly demonstrates the decline in successful pregnancy with assisted conception, as the woman's age increases.



**Figure 1: Graph illustrating the number of live births within the UK through IVF or ICSI treatments according to the age of the female at the time of birth, for the one year time period starting 1st April 1998 and ending 31st March 1999. (HFEA, 2000)**

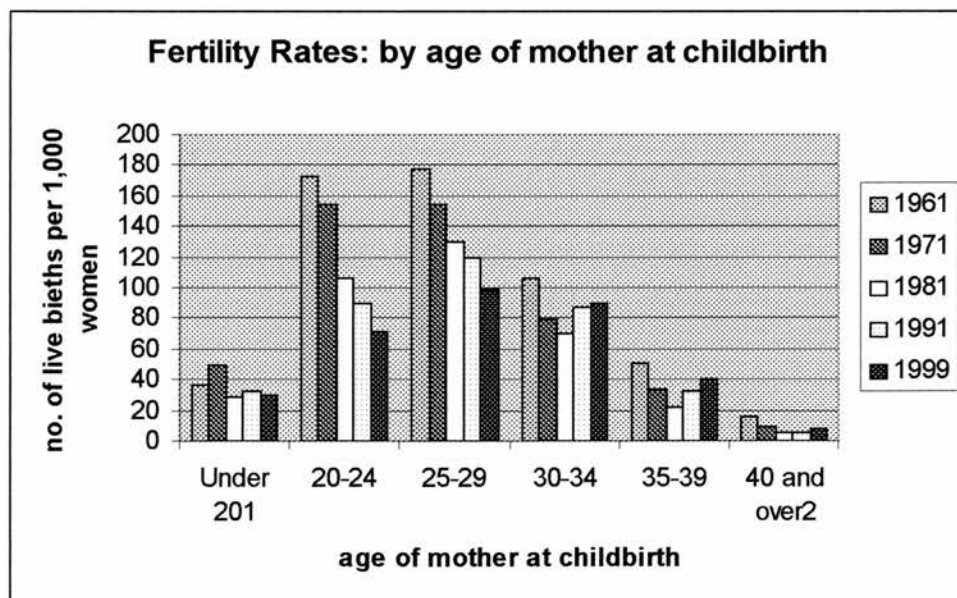
There are also reports that indicate that the quality of semen declines as the male ages (Auger et al, 1995). Irvine et al (1996) investigated semen quality in a group of over 500 Scottish men born between 1951 and 1973. They suggest that this study provides direct evidence that semen quality is deteriorating over time, with a later year of birth in the male being significantly associated with a reduced number of sperm in adult life.

### 1.2.2 Epidemiological Information

Before considering the rates of assisted conception births it is important to gain an overview of normal fertility birth rate statistics to establish any significant differences or deviations from what might be expected.

### 1.2.3 Normal fertility rates

The Human Fertilisation and Embryology Authority (HFEA) (2000) statistics reveal that the overall level of fertility in the United Kingdom fluctuated significantly during the 20th century. Fertility was lower (57 live births per 1,000 women aged 15 to 44) at the end of the century than at the start (115 live births per 1,000 women aged 15 to 44). Fertility patterns have also varied by age and the HFEA, (2000) data confirms that there has been a shift towards later childbearing. The mean age at childbirth in the UK rose from 26.2 years in 1971 to 29.0 in 1999. Women aged 25 to 29 are still the most likely to give birth, but since 1992 those in the 30 to 34 age group have been more likely to give birth than those aged 20 to 24. Figure 2 represents the number of live births per 1000 women, according to the mother's age at the time of childbirth.



**Figure 2: Graph illustrating UK fertility rates of the female partner according to the age of the female at the time of birth (HFEA, 2000).**

Amongst couples of proven normal fertility the highest conception rate per monthly cycle is 33 percent occurring in the first month. The monthly rate then rapidly decreases to about 5 percent. Therefore the normal average rate of conception in any monthly cycle is on average 20-25 percent. Ten percent of fertile couples take more than one year to conceive, and five percent take more than two years, on the basis of statistical chance.

#### **1.2.4 Infertility Rates**

About one in six couples seek specialist help because of difficulty in conceiving although this includes some trying for a second pregnancy (Morrow et al, 1995). As Human fertility is relatively inefficient, any treatment for sub-fertility that offers as much as 25 percent chance of conception each cycle is as good as can be expected by reference to the normal fertility statistics.

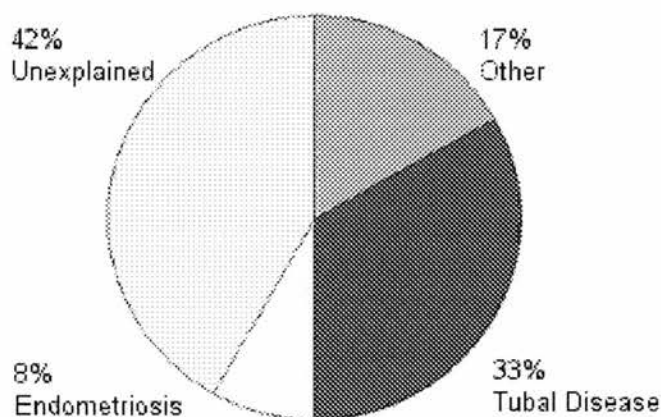
The male and female reproductive systems are intricate, and unfortunately many aspects of this system can become dysfunctional within an individual's lifetime. Although the word 'infertility' is commonly used, to be 'infertile' is actually rare and the medical definition suggests that it is a total absence of reproductive function. Most people seeking treatment have a varying degree of 'subfertility'.\* One or more parts of their reproductive systems are impaired in some way and they will need some medical intervention to help them to conceive.

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\* In line with previous research the present study will use the word infertility throughout this thesis to include varying degrees of sub-fertility.



Infertility equally affects both men and women (HFEA, 2000). For men it is most commonly due to poor sperm quality. For women infertility can be due to a number of factors, such as a tubal disease, endometriosis, or other causes such as hormonal imbalances. Figure 3 outlines the percentage of the different causes of female infertility.



**Figure 3: UK statistics on the causes of infertility in the female partner for the one year time period starting 1st April 1998 and ending 31st March 1999. (HFEA, 2000).**

### 1.2.5 Fertility treatment in the NHS Context

In the UK, NHS provision for the treatment of infertility is inconsistent and dependent on the area in which the individuals live (College of Health, 1997). The NHS is divided into a number of geographical units called Health Authorities (HAs). Following the reorganisation of the NHS in 1991, each HA became the purchaser of local health services. Consequently, rather than there being central control over which treatments are offered by the NHS across the whole country, each HA draws up its own list of what it will fund. As a result not all HAs provide the same kinds of fertility treatment. For reasons that have no sound justification, infertility treatment is given

very low priority: a total of 25 percent of Authorities do not fund IVF at all. Unlike many other treatments that HAs purchase, fertility treatments have a number of eligibility criteria. These range from an upper limit on age, through the number of previous treatment cycles and number of previous children each partner may have had, to the length of the couple's relationship. Sixty-three percent of HAs currently have formal eligibility criteria for IVF. Eligibility criteria range enormously from one HA to another: the maximum age limit varies from 34 to 43 years.

Infertility is a complication that requires further recognition and attention from varying health care providers. The National Infertility Awareness Campaign (NIAC) was established in 1993 to raise public awareness of the issues surrounding infertility, and to lobby politicians, health authorities and purchasers to increase the state funding for infertility treatment. NIAC has become aware of the high emotional and financial impact on infertile couples that are involved in trying for a child. Because decisions on funding remain under the control of the Health Authorities, there is no Government information on the purchasing arrangements in a specific geographic area. In an attempt to improve this situation, NIAC commissions the Annual Survey of NHS Funding of Infertility Services. This report provides infertility patients across the UK with details on which treatments, if any, are available on the NHS in a specific area.

While the need for increasing provision of counselling to those who experience infertility has long been established (Van Balen and Trimbos-Kemper, 1993), there is now a legal requirement for licensed units in the UK to provide counselling for couples seeking licensed treatments (HFEA Act 1990). Kerr et al (1999) published a survey that investigated the experiences of couples who have had infertility treatment

in the UK. Participants in this survey were recruited via two of the largest national infertility support organisations in the UK: CHILD and PROSPECT. This study described differences in treatment received depending on geographical variation, who was responsible for the funding of the treatment, support from professionals, emotional difficulties experienced by the individuals and pregnancy outcome. Some 40 percent of the respondents were successful in conceiving, although 39 percent of these took more than 6 years. This survey revealed that 75 percent of the respondents had been forced to pay for some or all their treatment, whereas 18 percent of the respondents had their treatments fully funded by the National Health Service. Funding sources for the other 7 percent were unknown. This study confirmed that geographical variation impacts significantly on both availability of treatment methods and funding opportunities.

Having difficulty conceiving is a confusing and personal issue and many people in such a position are unsure of whom to contact for help. Studies carried out in the UK that have examined interest in infertility by GP's (Ittner et al., 1997) have shown that the majority of GP's do not routinely ask childless patients about their desire to have children. However, one-half of infertile men and one-quarter of infertile women reported that they would prefer the doctor to raise the subject. Indeed the Kerr et al (1999) survey outlined that only one third of infertility patients felt that their GP had provided sufficient information about the causes of infertility, investigations and treatment.

### 1.2.6 Infertility treatment in Scotland

There are six infertility units in Scotland that are approved by the Human Fertilisation and Embryology Authority (HFEA). Three are based in Glasgow, one is in Edinburgh, one is in Aberdeen and one is in Dundee. The HFEA publishes information and statistics on the live birth rates for the UK and on the live birth rates for each of the approved HFEA centres in the UK. Below is a comparison of the national data with data from the Assisted Conception Unit (ACU) in Dundee where the present study took place. Table 1 shows that the local ACU in which the study took place has a reasonably good record of live births in comparison to the UK average.

**Table 1: Table showing live birth rates for the UK and Local statistics from 1 April 1998 – 31 March 1999.**

	UK Data		Dundee ACU Data	
	< 38 years %	All ages %	< 38 years %	All ages %
All treatments	21 (4698/21274)	19.5 (5304 / 27230)	21.7 (98 / 452)	20.6 (109 / 529)
IVF only	25.6 (2674 / 10436)	22.7 (3072 / 13523)	23.6 (50 / 212)	23.6 (57 / 242)
ICSI only	25.6 (2024 / 7897)	23.1 (2232 / 9648)	29.6 (48 / 162)	25.9 (52 / 201)

The Dundee ACU supports both fee paying and non-fee paying (NHS funded) individuals and offers a range of treatments approved by the HFEA. For those who are eligible for NHS treatment, this purchasing health board agrees to fund up to three treatment cycles, however, any treatment cycle funded by the individuals themselves may count towards this. This means that if the couple self-fund treatment on one

occasion it may actually count as one of the allotted three and they may then only receive NHS funding for another two.

### **1.3 SPECIFIC TECHNIQUES IN ASSISTED CONCEPTION**

There are a multitude of techniques that have been developed over time to assist pregnancy. Some of the more common procedures are outlined below. All of these procedures are on offer to patients attending the Dundee Assisted Conception Unit, where this study took place.

Evaluation of an infertile couple requires a detailed medical, sexual, and reproductive history. Specific elements that must be evaluated by the Gynaecologist include many private issues. Some examples include length of time the couple has attempted to conceive, prior reproductive performance of each partner, menstrual cyclicality, symptoms suggestive of pelvic inflammatory disease or endometriosis, coital technique (timing, frequency, and level of satisfaction), use of medications, previous abdominal or pelvic surgery of the female, and urologic disorders of the male. It is usually requested that the women receive a thorough physical and pelvic examination, including an assessment of cervical cytology and cervical cultures (Chlamydia, Gonorrhoea, and Ureaplasma). In summary it is an extremely invasive and anxiety provoking procedure both physically and psychologically.

### **1.3.1 In Vitro Fertilisation (IVF)**

In Vitro Fertilisation involves the removal of mature oocytes (eggs) from the woman's ovaries and the fertilisation of the oocytes by sperm in the laboratory. Once fertilisation has occurred embryos are transferred to the woman's uterus. Only certain groups of patients are suitable for IVF. The treatment was originally developed for women who had damaged or blocked fallopian tubes. However, it has been shown that this technique will also increase the chance of pregnancy in other groups of patients including those with tubal disease, endometriosis and failure to ovulate. IVF has also been shown to be effective in cases of male sub fertility and unexplained infertility. Some patients receiving IVF still have a chance of falling pregnant without treatment, however IVF is recommended in these cases as the best way of improving their chances of pregnancy.

Success rates vary significantly from year to year and can be expressed in a number of ways. For the local ACU, 17 percent of IVF treatment cycles initiated in the year ending March 31<sup>st</sup> 2000 led to a live birth. Live birth rates for the year ending 31<sup>st</sup> December 2001 was also 17 percent for IVF. These figures take into account the facts that some cycles are not complete or may be abandoned because of a poor response to treatment. There are a multitude of reasons for failure that are not always detectable or explainable.

### **1.3.2 Intracytoplasmic Sperm Injection (ICSI)**

Intracytoplasmic sperm injection (ICSI) is a technique that involves the injection of a single sperm into the egg. Developed in Brussels, the first successful pregnancy was recorded in 1992, thirteen years after the first IVF baby was born. This technique was developed to assist fertilisation in couples where sperm characteristics would prevent an attempt at conventional IVF. Couples experiencing fertilisation failure following IVF may be candidates for this treatment, if the problem has been identified as attributable to the sperm. ICSI is a specialised version of IVF although for the couple there is no apparent difference from that of the conventional IVF. However, the technology involved in the handling of the eggs and sperm in the laboratory is very different. The cells surrounding the egg must be removed and the sperm prepared to enable an individual sperm to be recovered and injected into each egg.

The percentage of babies born alive for each ICSI treatment cycle started, for the year ending 31<sup>st</sup> March 2000 (this includes cycles which have been abandoned because of various reasons) was 17 percent. Live birth rates for the year ending 31<sup>st</sup> December 2001 were 23 percent for ICSI. Results fluctuate from year to year and in the past results have been as low as 11 percent and as high as 29 percent.

### 1.3.3 Sperm Recovery Techniques

Some men have no sperm in the fluid that they ejaculate. This is a condition known as azoospermia. This may be due to a mechanical blockage in the tubes draining the testes. If it is due to a blockage it is likely that normal sperm numbers are still being created. Alternatively, there may be no blockage in the tubes and the problem is due to very few or no sperm being produced in the testicle. Usually such men have little or no chance of fathering a pregnancy. However in some cases, one of two small operations may obtain enough sperm for injection into an embryo using ICSI thus allowing a pregnancy to be created.

In cases of mechanical blockage such as after vasectomy or when there is a congenital absence of the vas (the tube leading down from the epididymis), it would be reasonable to expect to recover sperm from the epididymis. This is achieved under a light anaesthetic using a fine needle, similar to the one used to take blood, to aspirate the epididymal fluid. This procedure is known as percutaneous epididymal sperm aspiration (PESA). Samples are assessed immediately in theatre by the embryologist and the procedure is usually completed in a short time, provided sufficient motile sperm are observed. If no sperm are obtained, then a procedure known as testicular extraction of sperm by aspiration (TESA) is carried out where a similar needle is inserted directly into the testicle and a small piece of tissue is withdrawn, which should contain sperm.

There are a small number of cases where the TESA sample gives insufficient sperm for ICSI. In these cases, a larger piece of tissue is required and this is achieved by



making a small incision in the scrotum to expose the testicle; the required tissue can then be removed.

#### **1.3.4 Egg Recovery**

This is done using a vaginal ultrasound probe to guide a needle into each ovary. The fluid in each follicle is then aspirated until oocytes are obtained. This is all done under a light general anaesthetic or by patient-controlled sedation and an anaesthetist is present at virtually all egg recoveries. Following this procedure the individual is commenced a course of pessaries to maintain hormone levels.

#### **1.3.5 Drugs**

Patients attending the ACU will be supplied with a complete package of the drugs necessary to their particular treatment. The drugs most commonly used in the treatment cycles are:

1. Synarel – this is a nasal spray that suppresses the hormones controlling the ovary. The process referred to as ‘downregulation’ and a scan is conducted to confirm that downregulation has occurred before starting the following course of medication involving injections. Synarel is continued throughout the time period of an individual receiving the injections.
2. Metrodin HP/Menopur – this involves an injection of substances that stimulates the ovaries. During stimulation, precise ultrasound monitoring is necessary to assess the response of the ovaries, which is usually achieved by

measuring the number and size of follicles. When the follicles, which should each contain an egg, are the correct size the patient will be given HCG.

3. HCG – this involves an injection of the substance that brings about final maturation of the eggs.

### **1.3.6 Risks of the drugs and treatment**

The stimulation drugs mentioned above, occasionally lead to over stimulation and the formation of cysts, which are temporary. In about 5 percent of all cases, patients over-respond to the drugs with a condition called Ovarian Hyperstimulation Syndrome. This can occasionally progress to become severe with very serious risk to the patient's health. Ovarian Hyperstimulation Syndrome may require hospital admission and because the condition can be negatively affected by the individual being pregnant in the treatment cycle the ACU staff may advise that all embryos are frozen for later replacement. Patients are informed that if at any time they experience abdominal distension, pain, nausea or shortage of breath, then they should contact staff at the ACU or their GP as these symptoms could be an indication that they have developed Ovarian Hyperstimulation Syndrome.

It is possible that the technique of egg recovery could inadvertently damage organs close to the ovaries, such as blood vessels, bowel or bladder, although these complications are very rare. Bleeding or infection may also occur although these are usually easily managed.

Research evidence suggests that there is no increased risk to the child's health and that children born after assisted conception are at the same risk of experiencing health

problems as births that occur naturally. There is however an increased chance of multiple pregnancies. This is because more than one embryo is usually transferred. The risks involved in triplet pregnancy are very high and there is an unacceptable likelihood of premature birth and damaged babies resulting from this. There is also a risk of ectopic pregnancy, which is a pregnancy occurring outwith the cavity of the womb; the most common site being in the fallopian tube. A pregnancy occurring in the tube cannot continue and most often necessitates surgery and removal of the affected tube.

The HFEA (2000) data suggest that about five percent of cycles result in 'adverse outcomes', as compared to seven percent resulting in multiple births, twelve percent resulting in single births, and seventy six percent resulting in no clinical pregnancy.

### **1.3.7 Summary**

For this population of patients the risks are very real and the benefits (i.e., chance of becoming pregnant) are, in comparison, rather small. The medical procedures require much physical and emotional effort. Time spent waiting for test results or any other indication of success is an excruciating experience.

## **1.4 PSYCHOLOGICAL CONSEQUENCES OF INFERTILITY**

### **1.4.1 General**

Couples encounter a multitude of difficulties when attempting to conceive via assisted conception. It might be expected for these difficulties to impose a considerable psychological burden upon them, and anecdotal evidence indeed supports this view (Mennings, 1980). Freeman et al (1987) found that half of their sample of infertile couples described infertility as the most upsetting experience of their lives. Eighty percent of Mahlstedt et al's (1987) sample described their experience as either stressful or very stressful. Infertility can interfere with the patient's quality of marriage, sex life and relationships with family and friends, as well as their job and financial situation especially if they are not eligible for NHS-funded treatment. The overall percentage of psychological problems in infertile couples ranges between twenty-five and sixty percent (Seibel and Taymor, 1982). The interaction between emotional stress and infertility has been the focus of investigation for many years, as many infertile couples show marked distress during infertility evaluation and treatment, (Schenker et al, 1992). As reproduction is one of our most delicately balanced biological systems, psychological stress can also affect fertility.

### **1.4.2 Anxiety**

Recent studies have investigated anxiety at intake for IVF treatment, anxiety at the time of fertility treatment procedures, as well as fear that the treatment will fail (Golombok et al, 1992, Merari et al 1992, Slade et al, 1997). Moreover, a recent

study revealed significantly higher levels of anxiety in mothers, who had conceived by IVF, about the survival of their babies after birth when compared to matched controls (McMahon, et al., 1997).

Oddens et al (1999) investigated the occurrence of anxiety in a population of 281 patients awaiting infertility treatment and compared the data to a group of 289 population controls. They found that women with fertility problems consistently reported a higher prevalence of negative emotions such as anxiety than did the control group.

Bringhenti et al (1997) reviewed, amongst other things, the levels of stress and anxiety of women entering an IVF treatment cycle and a control group who were not receiving infertility treatment. They discovered that the infertile women had a significantly higher level of anxiety as measured on the State-Trait Anxiety Inventory compared to the control group. Connolly et al (1992) suggested that anxiety in infertile patients decreased with habituation to the process of infertility treatment. Their study examined the levels of anxiety in men and women who were undergoing treatment for infertility over two treatment cycles. They found that the levels of anxiety were significantly less at the second treatment cycle for everyone except men who were diagnosed with a fertility problem. Berg & Wilson's (1991) study advanced this investigation and looked at the stress and anxiety in couples across different stages of treatment up to and over 3 years. They found, like Connolly et al (1992) that emotional strain and anxiety were moderately elevated during the first year and had returned to more normal levels during the second year. In addition, however, they found that emotional strain and anxiety showed a marked increase beyond Year 3.

They suggest that their results are consistent with a model of psychological strain that reflects an acute stress reaction to the initial diagnosis and treatment overlaid with a chronic strain response to longer-term treatment.

### **1.4.3 Depression**

Descriptive reports suggest that couples with fertility problems undergo various forms of severe psycho-emotional distress that may render them susceptible to depression (Dunkel-Schetter and Lobel, 1991). Research shows that infertile women are much more likely than fertile women to have symptoms of depression (Berg & Wilson, 1995). Domar et al (1992) found that infertile women are twice as likely as fertile women are to experience depressive symptoms. Indeed, there is research that indicates that infertile women have levels of depression equivalent to women with cancer, heart disease, human immunodeficiency virus (HIV)-positive status and hypertension (Domar et al, 1993).

Infertility may trigger a depression (Domar et al, 1992) but whether or not the opposite is true continues to be debated at length within the literature. According to the American Society for Reproductive Medicine (ASRM, 1998) there is little evidence that depression can cause infertility. However, Wasser et al (1993) found that the experience of psychological distress such as depression, contributes significantly to the aetiology of some forms of infertility.

There are certainly some interesting findings that suggest that depression may exacerbate infertility. For example it has been reported that women with a history of depressive symptoms reported twice the rate of subsequent infertility (Lapane et al,

1995). In addition there is evidence suggesting that when women with depression are treated for their depression they show a far increased chance of becoming pregnant: a 60 percent viable pregnancy rate within six months, contrasting with 24 percent when depression remained untreated (Domar et al, 1999). Further research suggests that women who experienced depression following the failure of their first IVF cycle, had much lower pregnancy rates than their non depressed counterparts during their second IVF cycle (Beaupaire et al, 1994).

Most individuals grow up assuming they are fertile. Many couples who eventually attend for assisted conception have been actively using contraception to prevent pregnancy. Many feel as though they should be able to control fertility. Infertility affects individuals in terms of their control and choices, leaving them vulnerable to depression and feelings of hopelessness (Leiblum and Greenfield, 1997).

#### **1.4.4 Stress**

It has been a common assumption, if not a 'cultural truism' (Leventhal and Tomartken, 1987), that stress is associated with the impairment of health. The interaction between emotional stress and infertility has been investigated for many years. Such research originated from the pioneering work of Selye (1950) who observed ovarian atrophy in rats exposed to a variety of noxious stimuli. More recently, laboratory studies in both experimental animals and humans have shown interactions between the physiological pathways activated during stress and the reproductive axes (Moberg, 1987). It has been postulated that psychological stress alters levels of cortisol, prolactin and progesterone, which in turn have an adverse effect on pregnancy outcome (Milad et al 1998). Many infertile couples show marked

stress during infertility assessment and treatment (Schenker et al 1992). Band et al (1998) investigated psychological stress in a sample of 51 men with male factor infertility and concluded that male infertility is perceived as stressful. Furthermore they found that those who were more likely to perceive the situation as stressful were more at risk of depression.

Some research has indicated that mood can have an effect on ovulation or embryo implantation, and that high levels of stress may also cause fallopian tube spasm or decreased sperm production. There is more inclination than ever before to make a connection between stress and triggers to chemical and physical reactions in the body.

Researchers have studied the possibility that stress causes infertility. Wasser (1994) investigated the causal role of stress on infertility by examining stress levels of infertile women with neuroendocrine disorders compared to infertile women experiencing anatomical disorders. The findings were consistent with the hypothesis that psychosocial distress contributed significantly to the aetiology of some forms of infertility.

#### **1.4.5 Avoidance and Intrusion**

There are a number of publications that identify avoidance and psychological intrusions as a complication of infertility or as a result of pregnancy loss. While commonly associated with war or natural disaster, these symptoms have been described in patients who are undergoing or who have completed infertility treatment or high-risk pregnancies. Bartlik et al (1997) describe three case studies of patients



who have developed symptoms of intrusion and avoidance following such pregnancies.

Seng et al (2001) concluded that the treatment of psychological intrusion and avoidance symptoms might improve pregnancy morbidity and maternal mental health. They found that women who presented with these symptoms had higher odds ratios for ectopic pregnancies, spontaneous abortion, pre-term contractions and excessive fetal growth.

Miller et al (1998) hypothesised that women undergoing treatment for infertility would display the characteristic signature response to traumatic stressors, namely a pattern of intrusive and avoidant ideation, in addition to depression and anxiety. They found that patients undergoing infertility treatment experienced greater stress related intrusive ideation than the control group. They also found that infertility patients manifested lower levels of avoidant ideation when compared with the norms for psychiatric patients.

#### **1.4.6 Gender differences in response to infertility**

A number of studies carried out in recent years have examined the differential impact of infertility on men and women. Studies have shown that women report more anxiety and depression (Slade et al 1997), less life satisfaction, (Newton et al 1990) and anticipate experiencing more stress during IVF (Collins et al, 1992) than men. Newton et al (1990) found that 25 percent of women had a mild or moderate level of depression three weeks after a failed IVF cycle and that this level of depression was much less common among men (i.e., 12%).

Newton and Houle (1996) identified that women take greater responsibility, take a more active role in treatment and are more troubled by treatment failure than men. They identify that men seem less directly affected, are more likely to engage in denial, and are more willing to consider treatment termination.

Similarly Abbey et al (1991) found support for the hypothesis that women's lives are more disrupted by infertility than those of men, in their survey of 185 infertile couples. Infertile wives in Abbey et al's (1991) study perceived the fertility problem as more stressful, felt more responsible for and more in control of the infertility and engaged more in problem focused coping strategies. This study did not account for which member of the couple was receiving direct medical treatment for infertility and it is plausible that the results may have been significantly influenced by this factor. Assisted conception is a highly invasive procedure and can therefore be emotionally distressing. For example, if the women in Abbey et al's study were the only partner to be receiving medical treatment it is possible that their level of distress was an artefact of or exaggerated by the invasive medical procedure. In addition many of the studies consider not the full range of infertility treatments available but focus on in-vitro fertilisation or intracytoplasmic sperm injection, excluding treatments that may be more specific to male infertility and therefore more invasive for the male.

### **1.4.7 Summary**

This chapter has reviewed some of the psychological consequences experienced by patients attending for treatment of their infertility. It is very difficult to examine whether the stressors may be due to being infertile or whether they are more associated with the treatment itself. This is clearly hard to establish empirically as those who do not attend services are not easily identifiable to any researcher. Most previous studies have assumed that the psychological consequences have been due to a combination of being infertile and undergoing treatment. Overall, research indicates that ACU patients experience significant stressors that impact on their psychological well-being and that women are generally more affected than men.

## **1.5 PSYCHOLOGICAL INTERVENTIONS APPROPRIATE FOR THIS POPULATION**

Given that it has been shown on numerous levels that infertility is a stressful experience it seems appropriate to investigate interventions aimed at alleviating these stresses. The basic aim of any intervention for infertility patients is to ensure that patients understand the implications of their treatment choice, receive sufficient emotional support and can cope in a healthy way with the consequences of the infertility experience (Boivin et al 2001).

There are essentially two main categories of infertility: anatomical defects or hormonal imbalances. Anatomical defects include problems such as blocked tubes and endometriosis. These are easily found and are sometimes repairable. Hormonal imbalances, on the other hand, are often overlooked and are ill defined. Stress can become an influential factor on hormonal imbalances and any attempts to reduce stress levels may lead to a positive alteration in hormones and an increased chance of pregnancy (Wasser et al, 1993).

### **1.5.1 Stress Management**

There are very few reported outcome studies for the effectiveness of stress management groups in couples with fertility concerns. One particular study by McNaughton-Cassill et al (2000) reports on the efficacy of stress management groups for couples offered concurrently with IVF treatment. Seventeen couples were recruited to attend a stress management program that employed a cognitive

behavioural basis. Unfortunately the authors did not report any psychometric evaluations of the decline in stresses but stated that participants reported that the group had helped them deal with the stress of infertility. The group members also reported that they had benefited from the social bonds that they had formed with the other group members. This study was based on a very small biased sample. Evaluation was only possible on 12 females and 8 males due to the lack of follow-up evaluations. The study sample was significantly biased as all recruits were United States Air Force members or the spouse of such a member. In addition the report did not include any control group.

### **1.5.2 Hypnosis and Autogenic Training**

Given that stress alters many physiological responses in the body, which may then have an impact on the person's ability to conceive, it is reasonable to suggest that any intervention aimed at hindering these detrimental physiological responses may prove to be effective when attempting to become pregnant. Gravitz (1995) reports on two cases that illustrate the successful use of hypnosis and imagery in facilitating pregnancy in women for whom prior medical diagnostic procedures had revealed no somatic factors preventing conception. Gravitz reported that the hypnosis and imagery treatment was considered to have had beneficial results. Unfortunately Gravitz (1995) did not give any estimation of the chance of these women conceiving without the intervention of hypnosis.

Wolfgang (1994) reviewed controlled outcome studies on Autogenic Training over a range of target behaviours and disorders including infertility. Wolfgang suggests that the qualitative findings show that Autogenic Training was associated with a medium

sized effect from pre-treatment to post-treatment. He goes on to argue that this analysis supports the potential of Autogenic Training as a treatment for a variety of psychological and psychosomatic disorders including infertility.

### **1.5.3 Behavioural strategies**

There is increasing evidence to suggest that a behavioural treatment approach may be efficacious in the treatment of the negative emotional aspects of infertility and may lead to an increase in conception rates. Domar et al (1990) found that the first 54 women to complete a behavioural treatment program based on the elicitation of the relaxation response showed statistically significant decreases in anxiety, depression and fatigue as well as increases in vigour. In addition, they reported that 34 percent of these women became pregnant within 6 months of completing the program. There were no selection biases evident in Domar's population sample. This percentage of pregnancies is higher than would be expected when compared to the annual statistics published by HFEA (2000) of about a 20 percent success rate for women that are receiving assisted conception. Domar et al (1990) suggest that these findings establish a role for relaxation in the long-term treatment of infertility. Domar et al have proceeded to establish 'The Mind/Body Program' for infertility in the United States and continues to report favourable outcomes. More recently Domar et al (2000) have included many aspects of cognitive work into The Mind/Body Program.

### **1.5.4 Cognitive Behavioural Strategies**

Counselling in reproductive medicine has tended to focus on bereavement theory as the primary model of understanding and practice. Hunt & Monach (1997) suggest that it is also important to consider depression as a particularly significant aspect, independent of it being seen as a stage in the mourning process. Cognitive Behavioural therapy has come to be widely accepted as an important approach to treating depression and Hunt and Monach (1997) describe clearly how it might be applied in the context of infertility counselling.

Myers and Wark (1996) outline a cognitive-behavioural model for treating couples' negative reactions to infertility. They highlight the importance of identification and validity testing of appraisals and attributions regarding infertility and marriage, redirection of the couples' energies toward alternative sources of satisfaction, communication and problem-solving techniques to facilitate expression of emotions and needs and resolution of the fertility crisis and improving the couples sexual relationship.

Domar et al (1999) report the efficacy of a ten-session Cognitive Behavioural Treatment program and report that significant post-program psychological improvement was clearly illustrated as 42 percent of the sample conceived viable pregnancies within six months of completing the program. Domar et al (2000) further advance the use of Cognitive Behavioural Therapy (CBT) by detailing empirical evidence of its uses within the infertility population. One hundred and eighty four women, who had been trying to conceive for two years or more, were randomly allocated to the CBT group, the support group or a Control group. All experimental

participants attended a ten-session group program. The CBT and support groups experienced significant psychological improvement at six and twelve months follow up with the CBT group experiencing the greatest positive change.

Tuschen et al (1999) evaluated the impact of a six month Cognitive Behavioural Therapy programme for infertile couples. Pre- to post-treatment changes in the group were compared to changes in two control groups. The experimental (therapy) group showed an improvement in sperm concentration, a reduction in thoughts of helplessness and a decrease in marital distress. At a six month follow up, problem focused thoughts had decreased and the live birth rate was higher in the therapy group than in the control groups. The authors concluded that this data suggests that Cognitive Behavioural treatments may be an effective approach for the treatment of infertility.

### **1.5.5 Recent guidelines for counselling in infertility**

All Assisted Conception Units now have a legal requirement to offer counselling to their patients (HFEA Act, 1990). This service is on offer UK-wide to all couples attending for assisted conception. There is evidence to suggest that counselling is effective for people with fertility problems. Tarlatzis et al (1993) describe the effectiveness of psychological counselling and supportive psychotherapy in reducing high levels of anxiety in couples undergoing different treatment programs. Boivin et al (2001) offer detailed guidelines for counselling in infertility, presented in six sections. The first section describes how infertility consultations differ from other medical consultations. The second section addresses fundamental issues in counselling. Section 3 focuses on how to integrate this care into routine medical treatment. Section



4 highlights some of the special situations that can provoke the need for counselling. Section 5 deals with the issues involved in gamete donation, surrogacy, and adoption for heterosexual and homosexual couples and single women. Section 6 deals with adjunct psychological services and covers the option of written psychosocial information, telephone counselling, self-help groups and professionally facilitated group work. Perhaps more importantly these guidelines suggest that the counsellor should integrate themselves within the assisted conception unit team. The report suggests that it is possible to identify two broad types of psychosocial care. 'Patient-centred care' is the psychosocial care provided as part of routine services at the clinic. 'Counselling' involves the use of psychological interventions based on specific theoretical frameworks. Whereas patient-centred care is expected from all members of the medical team at all times, counselling should typically be delivered by a trained mental health professional.

#### **1.5.6 Summary**

There is much research evidence to suggest that a range of psychological interventions, including counselling, Cognitive Behavioural Therapy and Behaviour therapy, may be beneficial to people who are undergoing treatment for infertility. The outcome measures used to evaluate the effectiveness of such treatments include the use of questionnaires measuring mood states, physiological responses and measures of post treatment conception rates. The suggestion that stress management groups could be generally beneficial and might increase a couple's ability to conceive has high face validity, but there is surprisingly little evidence in support of this contention.

## **1.6 THE LACK OF UPTAKE OF PSYCHOLOGICAL INTERVENTIONS**

It has been shown that many couples undergoing assisted conception experience negative psychological symptoms. However, it is unusual for these individuals to become involved in psychologically based treatment that might help to alleviate these problems.

### **1.6.1 Previous Research**

Much of the research that has been conducted in the area of patients' attendance rates and reasons for not attending psychological therapies for treatment of the distress associated with infertility has been in relation to either support groups or counselling services. No study to date has assessed the reasons for non-attendance at a Clinical Psychologist-led stress management program.

Clinical papers strongly recommend psychosocial counselling for patients attending infertility clinics. This recommendation is consistent with interest that patients themselves have expressed in receiving more psychosocial help during treatment (Souter et al 1998). Despite the consensus of opinion among these professionals and patients regarding the necessity and potential benefit of psychosocial counselling very few patients actually use these services. Halman et al (1993) investigated patients' satisfaction with fertility treatments in general. They found that both men and women were satisfied with the infertility treatment they had received. The most frequently mentioned reason for satisfaction was the emotional support of infertility specialists. Both men and women advised infertility specialists to be compassionate and share

information with their patients. Halman et al (1993) concluded that a variety of psychosocial factors were related to treatment satisfaction. These results suggest that doctors and their staff should pay particular attention to their patients' emotional needs and that patients benefit from sympathetic input.

Studies have shown that only about eleven to twenty one percent of patients offered counselling decide to attend individual, couple or group sessions when these are made available to them. A study by Sundby et al (1994) found that although eighty percent of patients knew of their local infertility support group, less than five percent were members.

Boivin (1997) suggests that the disparity between recommendations and the actual use of such services would seem to be due to the lack of distinction between the needs of the few highly distressed patients who feel overwhelmed by their infertility and those of the average infertile couple who experience distress but cope well with it. In the former case, psychosocial counselling is likely to be beneficial, while in the latter case more informal sources of help, perhaps provided through the ACU staff, are likely to be sufficient.

Little is known about the factors that influence any patient's decision not to attend psychosocial services. It has been established (Berg and Wilson, 1991) that patients who attend support groups tend to experience more personal and / or marital distress than those who do not attend. In addition, those who drop out of counselling tend to experience less distress than those who continue with sessions (Stewart, 1992).

Pook et al (2001) investigated the characteristics of male patients that do take up the offer of psychological couple counselling. The level of depression and anxiety in

infertile male patients who attended couple counselling were compared to levels of depression and anxiety in infertility patients that attended an andrological clinic. The results suggest that an increased level of distress, the feeling of being responsible for infertility and few marital difficulties increase the likelihood of the usage of couple counselling by male infertility patients.

Boivin et al (1999) investigated reasons why infertile patients do not use psychosocial counselling. They asked participants firstly to complete a short questionnaire concerning various factors relating to the uptake of counselling and secondly to estimate their current level of perceived distress. The results showed that the principal reason preventing patients from using psychosocial counselling varied as a function of perceived distress levels. More distressed patients failed to initiate contact with a counsellor because of practical concerns such as knowing who to contact and/or the cost of counselling.

### **1.6.2 Theoretical Basis for Non-Attendance**

The Health Belief Model (Rosenstock, 1966) attempts to predict health-related behaviour in terms of certain belief patterns. The model has been applied to many studies encompassing all types of health behaviour (e.g. Kloeblen and Batish, 1999). This model proposes that the likelihood of an individual using health services such as stress management groups is a function of the perceived severity of the distress and the extent to which services are thought to be beneficial. A person's motivation to undertake a health behaviour can be divided into three main categories (Rosenstock, 1966): individual perceptions, modifying behaviours and likelihood of action. Individual perceptions are factors that affect the perception of illness or disease; they

are concerned with the importance of health to the individual, perceived susceptibility and perceived severity. Modifying factors include demographic variables, perceived threat, and cues to action. The likelihood of action category encompasses factors relating to the probability of pursuing the appropriate health behaviour; it is the likelihood of taking the recommended preventative health action. One of the limitations of the Health Belief Model is that different questions are used in different studies to determine the same beliefs; consequently, it is difficult both to design appropriate test measures of the model and to compare results across studies (Kloeben and Batish, 1999). Also factors other than health beliefs may influence health behaviour practices. These factors include cultural influences, socio-economic status, and previous experiences. Although the health belief model has been criticised for these reasons it is likely that with careful methodology, such as controlling for other influential factors in the design of a study, this model may be appropriately used in an attempt to explain the discrepancy between apparent need for psychological interventions within the infertility population, and the low uptake rate of these services.

### **1.6.3 Summary**

Many patients undergoing treatment for infertility do not attend various forms of psychological interventions. The reason for this is largely unknown, although researchers have established that an individual's reasons for non-attendance may alter as a function of distress levels. It is possible that psychological models such as the Health Belief Model may aid in the explanation of why the majority of individuals receiving fertility treatment tend not to accept such offers.

## **1.7 AIMS AND HYPOTHESES OF THIS PRESENT STUDY**

### **1.7.1 Research Aims – Part I**

The study aims to examine the impact of experiencing infertility on the psychological well-being of couples awaiting treatment at the Dundee Assisted Conception Unit. To achieve this, ACU Waiting List patients and their partners were compared with a matched general population group. This is similar in design to the study by Oddens et al (1999) that used a control group of women from the general population who were free of fertility problems. This study aims however to examine the impact of infertility on both members of the couple and not exclusively the female partner. In addition the present study aims to control for and examine any effect of which partner is receiving direct treatment. The participants' levels of anxiety, depression, stress and psychological intrusions and avoidance are examined as a measure of their current psychological distress.

### **1.7.2 Research Aims – Part II**

The second part of the study aims to examine whether being offered treatment and starting a new treatment cycle has any effect on the couples' levels of psychological distress. Patients that had just been invited to attend the Dundee ACU to begin a new treatment cycle were therefore recruited for this part of the investigation. A further aim of this study was to establish some of the reasons why the Assisted Conception population is hesitant in becoming involved in stress management programs. The research evidence clearly suggests firstly, that this is a stressful experience and

secondly that stress may impact negatively on a couples' chance of becoming pregnant. In addition, the study aims to establish whether present stress levels influence an individual's decision to participate in such groups and reasons for their non-participation.

### 1.7.3 Hypotheses

Hypotheses 1 and 2 relate to both the ACU Waiting List group and the matched Control group. Hypotheses 3, 4 and 5 relate only to the ACU Waiting List group. Hypotheses 6 and 7 relate to comparisons between the ACU Waiting List group and the ACU Treatment group. Hypothesis 8 and 9 relate only to data collected from the ACU Treatment group and examines some of the reasons that these individuals give for non-attendance at a stress management program.

### 1.7.4 Part One Hypotheses

#### **Hypothesis 1:**

**The ACU Waiting List group will experience more elevated levels of psychological distress than the Control group.**

It has long been established that infertility can have a significant negative affect on an individual's psychological well-being. Hypothesis 1 is based on the findings of Oddens et al's (1999) study that compared women experiencing infertility to a matched control group of women from the general population.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It



would therefore be hypothesised that the ACU Waiting List group would have more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than the matched Control group.

**Hypothesis2:**

**There will be a higher incidence of ‘caseness’ in the ACU Waiting List group than the Control group.**

Research examining psychological distress to the extent of ‘caseness’, where caseness is considered to be scoring within certain parameters on each of the assessments, in individuals with infertility has indicated that this group is likely to reach caseness frequently (Guerra et al, 1998). This hypothesis was designed to allow for a comparison of this group of individuals with the normal group and not the standardised psychiatric norms.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that the ACU Waiting List group would reach caseness on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms more frequently than the matched Control group.

Hypotheses 3, 4, and 5 relate only to the ACU Waiting List group. These hypotheses examine the dynamics of this group and whether stress levels are affected according to which member of the couple is receiving treatment.

**Hypothesis 3:**

**Women experience more distress than men regardless of whether the male receives direct treatment.**

Previous research that has investigated the effects of fertility treatment on men and women and how they differ in their responses has not taken into consideration which partner is receiving the treatment. Treatment for assisted conception is very invasive, especially so for the female. It is very likely that this may impact negatively on the woman's psychological well-being in addition to any negative effect of other aspects of infertility. Other studies have focused solely on either the infertile male or the infertile female.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that women in the ACU Waiting List group would report more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than men in the ACU Waiting List group regardless of whether the male receives direct treatment.

**Hypothesis 4:**

**Older women in the ACU Waiting List group will experience more elevated levels of psychological distress than younger women in the ACU Waiting List group.**

No previous research has indicated that age may influence a woman's levels of psychological distress when undergoing treatment for infertility. Indeed Luske and Vacc (1999) found that the age of the female had no influence on the levels of grief and depression in their study. This is surprising because of the clear age restrictions that are employed by assisted conception units in general. These age restrictions often dictate that once a woman has reached a certain age she will not be accepted for any form of infertility treatment. In addition a woman's fertility decreases after the age of 35. It is possible that a degree of desperation becomes introduced once a woman has passed a certain age. Nevertheless, it is also possible that women of an older age have accepted that they may not have children.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that the older women in the ACU Waiting List group would report more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than the younger women in the ACU Waiting List group.

**Hypothesis 5:**

**The number of treatment cycles previously experienced will influence the woman's level of psychological distress regardless of her age.**

Previous research has indicated that psychological distress is high at the beginning of treatment, reaches a plateau towards the second year and second treatment cycle and increases further in the third year (Connolly et al, 1992; Berg & Wilson, 1991). Although other studies (Luske and Vacc, 1999) have reported that the number of failed treatment cycles had no effect on the levels of grief and depression in different population sample.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that women in the ACU Waiting List group who had experienced two or more treatment cycle would report more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than the women in the ACU Waiting List group who had experienced one or no treatment cycles.

### 1.7.5 Part Two Hypotheses

#### **Hypothesis 6:**

**Levels of distress in the ACU Treatment group will be higher than the levels of distress in the ACU Waiting List group.**

There is little evidence to suggest that being offered treatment would be more or less stressful than awaiting treatment. However it was considered that individuals who have been offered treatment may experience higher levels of psychological distress than those who are awaiting treatment. The hypothesis was predicted to be in this direction because the entire process of treatment will play such a large role, both emotionally and practically, in the couples' lives.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that the ACU Treatment group would report more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than the ACU Waiting List group.

**Hypothesis 7:**

**Women will experience more psychological distress than men regardless of whether they are awaiting treatment or are starting a treatment cycle.**

There is ample evidence to suggest that women are more negatively affected by infertility than men (Abbey et al 1991). There is no reason to assume that this should alter over the course of being offered treatment, although this hypothesis was intended to confirm this assumption.

Measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. It would therefore be hypothesised that women in both the ACU Waiting List group and the ACU Treatment group would report more elevated scores on the measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than the men in both the ACU Waiting List group and the ACU Treatment group.

**Hypothesis 8:**

**Distressed individuals' reasons for non-attendance at a stress management program will be different to less-distressed individuals' reasons for non-attendance.**

Few researchers have examined reasons why people do not attend psychological interventions aimed at alleviating the stress of infertility. Boivin et al (1999) examined reasons for people's non-participation in counselling and found that less distressed individuals reported that the coping resources available to them were sufficient to cope with the strains of infertility. More stressed individuals were more likely not to attend because of practical and financial concerns such as knowing who to contact and the cost of counselling. Other possible factors preventing patients from using interventions may include concerns about privacy, fears that they may be perceived as emotionally and/or mentally unstable or abnormal in some way, or practical concerns such as the cost or scheduling of sessions (Hernon et al, 1995).

Unfortunately, Boivin et al (1999) failed to measure the individual's levels of stress in any objective way and relied on the individual's perception of their own stress levels. The current study used measures of anxiety, depression, perceived stress, psychological intrusions and avoidance symptoms to establish whether an individual should be defined as distressed and less-distressed. This categorisation was then used to compare results from the questionnaire and establish any differences between the two groups in their reasons for non-attendance.

**Hypothesis 9:**

**The distressed group will be more likely to want to attend a stress management program than the less-distressed group.**

Research has established that the uptake of counselling by patients attending an assisted conception unit is very low (Sundby et al, 1994). Some researchers have suggested that this may be due to the fact that most of these couples cope very well with their moderately high levels of psychological distress. However Boivin et al (1999) suggest that there may be a subgroup of this population who are more significantly psychologically affected than the rest of the group. Boivin et al (1999) suggest that it is this subgroup of individuals that may take up the offer of counselling more readily than the rest of the population. It is therefore possible that the decision on attendance may alter as a function of the level of distress experienced by the individual.

Measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms were used to examine psychological distress in this hypothesis. An individual was categorised as stressed if they reached caseness on two or more of the measures of psychological distress. Decision of whether to attend or not attend such a group was assessed using a scale from zero to ten, (see Appendix 3). Individuals were considered to be likely to attend such a group if they rated the likelihood of them attending to be five or above.



## **CHAPTER TWO**

### **METHOD**

## **2.1 DESIGN**

### **2.1.1 Part One**

The first part of the study applied a between-subjects design. Measures of Anxiety, (Beck Anxiety Inventory, Beck et al, 1988), Depression, (Beck Depression Inventory II, Beck et al, 1996), Perceived Stress (Perceived Stress Scale, Cohen et al, 1983), and intrusions and avoidance symptoms (The Impact of Events Scale, Horowitz et al, 1979) were used. Patients awaiting treatment from the Dundee Assisted Conception Unit constituted the first group and will be referred to as the ACU Waiting List group. The Control group consisted of a matched general population group. Each group consisted of men and women who are currently in a relationship and between the ages of 20 and 45 for the females and 20 and 60 for the males. Many of the previous research studies investigating the effects of assisted conception have concentrated solely on the females' psychological stresses to the exclusion of the impact on the male. In addition, only a small number of studies have had a general population matched Control group.

### 2.1.2 Part Two

It had been hoped that following a general investigation of the psychosocial impact of infertility on men and women awaiting treatment at the ACU, a stress management group could be initiated and that both men and women could attend. An evaluation of the efficacy of the Clinical Psychologist Trainee-led group was planned using standardised psychological measures and rate of pregnancy. A control group had been planned and was to be taken from the same population. The control group would have been offered the stress management group 3 months following final data collection from the experimental group. Unfortunately, after invitations had been distributed via the Assisted Conception Unit staff to 80 couples about to undergo a treatment cycle, and posters advertising the group had been displayed, only one couple was interested in participation. It was considered not to be worthwhile pursuing this area of research and applying for ethical approval in a different geographical area due to the astonishingly low rate of uptake at the Dundee ACU. It was at this stage that an investigation into some of the reasons why people undergoing assisted conception did not wish to attend such a group was considered appropriate. This investigation will be considered as part two of the study. The 80 couples who had been invited to attend the stress management groups could not be invited to participate in another study for clear ethical reasons. It was agreed by the Consultant Gynaecologist at the ACU and by the Ethics Committee that people who were at exactly the same stage of their treatment cycles at the assisted conception unit could be invited to participate. These were couples who were just about to be invited to the ACU to commence a new treatment cycle. This group of individuals will be referred to as the ACU Treatment

group. This part of the study used a within-subjects design and because it was exploratory in nature did not require a control group. Couples were invited to participate by completing the same questionnaires as in part one of this study that measured levels of anxiety, depression, perceived stress and intrusions and avoidance symptoms and a questionnaire designed to investigate reasons for not wishing to attend a stress management group. An open-ended question was included in this questionnaire to yield information on reasons for not wishing to attend a stress management group. The final questionnaire was designed by the author and as yet is not standardised and is therefore employed in this study as a pilot of this measure.

The Local Committee on Medical Research Ethics granted approval for this study to be carried out. Two submissions to the ethics committee were made one for each part of the study. Minor changes were requested for the patient's information leaflet, but no changes were made to the research design.

## 2.2 PARTICIPANTS

### 2.2.1 Participants in Part One

The participants in the ACU Waiting List group of the study were all patients awaiting treatment at the Assisted Conception Unit in Dundee. A cross-section of one hundred couples was invited to participate in the study investigating stress, anxiety, depression and intrusions and avoidance levels in this population. To protect the anonymity of all couples awaiting treatment at the Assisted Conception Unit the unit manager (and not the researcher) selected individuals for participation, at random, and posted their invitations to participate, information sheets, consent forms and questionnaires. Thirty-five couples agreed to participate in this study and completed the attached questionnaires. Four were excluded because the participant had failed to complete the measures correctly or because only one of the couples had replied. Members of the matched Control group were recruited at a later stage and were matched for age, gender, occupation and level of education and relationship status. Each member of the Control group was matched exactly to a member of the ACU Waiting List group on gender and relationship status. Most were also matched exactly on age and level of education although where this was not possible they were matched one year in age either side of the ACU Waiting List group member and one level of education more or less than the ACU Waiting List group member.

Members of the Control group were recruited into the study via opportunistic sampling which allows the researcher to follow many leads and take advantage of the

flexibility, (Patton, 1990). This group were asked to complete the same psychological questionnaires as the ACU Waiting List group.

The criteria for inclusion in the study for the ACU Waiting List group were:

- Between the ages of 27 - 42 for women, and 27 – 60 for men.
- In a relationship
- At least one partner must be awaiting treatment from the ACU.

The criteria for inclusion in the study for the matched Control group were:

- Between the ages of 26 - 43 for women and 26 – 60 for men.
- In a relationship
- Never experienced any medical investigation for their fertility.

The age criteria differed between the two groups to allow for appropriate matching of the control group to the ACU Waiting List group.

Table 2 below illustrates the number of people, sex and mean age of each of the groups.

**Table 2: Demographic information for the ACU waiting list group and the Control Group.**

	ACU Waiting List Group		Control Group	
	Male	Female	Male	Female
Number	31	31	31	31
Mean Age (SD)	37.42 (5.28)	34.19 (3.36)	37.16 (5.14)	34.45 (3.48)

### **2.2.2 Participants in Part Two**

Part two of the study consisted of patients at the Assisted Conception Unit who had just been invited to commence a new cycle of treatment. Once again these patients were contacted directly by the Assisted Conception Unit Manager to protect their anonymity from the researcher. Once again couples were selected at random and invited to participate via mail.

The criteria for inclusion in the study for the ACU Treatment group were:

- Between the ages of 27 - 42 for women, and 27 – 60 for men.
- In a relationship
- At least one partner must have recently been offered treatment from the ACU.

## **2.3 MEASURES**

### **2.3.1 Beck Anxiety Inventory (BAI)**

The Beck Anxiety Inventory (Beck et al, 1988) is a 21- item scale that measures the severity of anxiety in adults and adolescents. It was developed to assess the symptoms of anxiety. Each of the 21 items is rated on a scale yielding an overall measure of the severity of an individual's level of anxiety. According to the 1993 edition (Beck & Steer, 1993) of the manual, scores of 0-7 should be interpreted as 'minimal' anxiety. Scores of 8-15 should be interpreted as 'mild' anxiety. Scores of 16-25 should be classified as 'moderate' anxiety. Finally, scores of 26-63 should be interpreted as 'severe' anxiety.

This questionnaire was chosen because it is a well-known and well-researched measure of the symptoms of anxiety. The BAI is known to have high internal consistency (Cronbach's coefficient alpha = .92), and good content, concurrent, construct, discriminant and factorial validity.

### **2.3.2 Beck Depression Inventory II (BDI – II)**

The Beck Depression Inventory II (Beck et al, 1996) is a 21-item self-report instrument for measuring the severity of depression in adults and adolescents. This version of the inventory (BDI-II) was developed for the assessment of symptoms corresponding to criteria for diagnosing depressive disorders listed in the DSM-IV. According to the manual (Beck et al, 1996) scores of 0-13 should be described as 'minimal' depression. Scores of 14-19 should be referred to as 'mild' depression.



Scores of 20-28 should be classified as 'moderate' depression. Finally, scores of 29-63 should be interpreted as 'severe' depression.

This questionnaire was chosen because it is a well-known and well-researched measure of the symptoms of depression and has been used frequently in previous studies in this area, (e.g., Band et al, 1998). In addition, and similar to the BAI, the BDI – II is known to have high internal consistency (Cronbach's coefficient alpha = .92 for an outpatient study and = .93 for a study involving college students), and good content, concurrent, construct, discriminant and factorial validity.

### **2.3.3 Perceived Stress Scale (PSS)**

The Perceived Stress Scale (Cohen et al 1983) was designed to measure the 'degree to which situations in one's life are appraised as stressful'. The scale consists of 14 items that refer to subjective appraisal of events occurring within a one-month time frame. Higher scores on this measure indicate more perceived stress. The authors suggest no specific categories or cut-offs although give a mean score of 19.62 (SD = 7.49) for a random sample of people interviewed by telephone.

This questionnaire was chosen because it is a frequently used and researched measure of an individual's perceived levels of stress and has been used in this area of research in other studies, (Abbey et al, 1992: Band et al, 1998). In addition the internal consistency for this measure as reported by Cohen et al (1983) was good for the three separate samples used, (Cronbach's alpha was .84, .85 and .86 in the three samples tested). Test-retest reliability has shown to be high over a short period of time ( $r = .85$ ).

### 2.3.4 The Impact of Events Scale (IES)

The Impact of Events scale (Horowitz et al, 1979) is the most widely used self report measure of specific responses to trauma. It consists of 15 questions and has two sub-scales that measure intrusion and avoidance. The intrusion sub-scale measures the extent to which memories of a traumatic event continue to impinge upon the mind and the avoidance sub-scale measures the extent to which the individual tries to avoid memories, getting upset and reminders of the event. Together the two scales give a total Impact of Events score and serve as a useful indicator of the extent to which a traumatic event is reverberating in the mind. Higher scores indicate a greater degree of symptoms in line with those of posttraumatic stress disorder (PTSD). Although this questionnaire was not used specifically to diagnose PTSD it was considered of value in the present study because of its specific measurement of psychological avoidance and intrusion symptoms.

This questionnaire was chosen because it is a well-known and researched measure of psychological avoidance and intrusion symptoms that may manifest following a traumatic experience. It has also been shown that the internal consistency for this measure is high (Cronbach's alpha for intrusion = .78 and for avoidance = .82). In addition, Horowitz et al, (1979) also reported the test-retest reliability to be satisfactory ( $r = .87$  for total score).

There might be some question as to what comprises the 'traumatic event'. It was for this reason that the questionnaire specifically asked each individual to note their most stressful experience relating to their experience of infertility, to date.

### 2.3.5 Background/Demographic Information

General information was collected via the patient information questions. The main reason for this was to examine whether these factors were influencing the data set at the point of analysis and to enable an investigation of any influence should it arise. These factors were chosen in line with other research projects in this area and for participants in the ACU Waiting List group included:

- Gender
- Age
- Occupation
- Education Level
- Stage of fertility treatment cycle
- Index person
- Number of previous treatment cycles
- Most stressful event in relation to the fertility treatment process.

For the matched Control group the following factors were included:

- Gender
- Age
- Occupation
- Education Level
- Relationship Status
- The incident of any fertility treatment

### **2.3.6 Questionnaire investigating reasons for not attending a stress management group**

A literature search was conducted in line with the latest SIGN guidelines (SIGN, 2002) and electronic databases were accessed. However, the literature search revealed no specific questionnaire relating to reasons why people may not wish to attend a stress management program it was decided that the researcher should develop the measure. The procedure for the development of this measure was as follows:

*Step one:* A systematic literature review was performed, the results of which were used to aid in the development of questionnaire items.

*Step two:* The researcher then discussed reasons for non-attendance for psychological intervention with a small focus group (n=4) and used their contributions to develop further questionnaire items.

*Step three:* The researcher presented the questionnaires to the focus group (n=4) and asked them to complete the questionnaire and evaluate it. Each member of the focus group at this stage reported finding the questionnaire satisfactory in terms of ease of completion and relevant individual items. The questionnaire was also peer reviewed by four colleagues working alongside the researcher as Clinical or Research Psychologists.

*Step four:* The questionnaire was then sent to the Local Research Ethics Committee along with the protocol for this part of the study and was given ethical approval. The questionnaire was then distributed by the Assisted Conception Unit manager to 80 couples for completion in this initial pilot study.

This questionnaire (see Appendix 3) was designed to encompass three broad categories; practical/financial, understanding of fertility problem as physical and psychological. Four questions relate to financial or practical problems (Questions 2,18,19,24). Four questions relate to the understanding of their problem as physical (Questions 4,8,20,23) and twenty questions relate to psychological factors. The items that fall within the psychological factors category can be subdivided into 5 further categories. Four items relate to group issues (Questions 1,3,7,13), four items relate to stress issues (Questions 5,6,14,17), four items relate to negative cognitive biases (Questions 9,10,15,22), four items relate to stigma issues (Questions 11,12,21,26) and four items relate to motivational issues (Questions 16, 25,27,28). It was considered appropriate in this study to have a heavier emphasis on questions relating to psychological factors as this research study was investigating reasons why couples had not attended a psychological intervention.

## 2.4 PROCEDURE

### 2.4.1 Part one

The Assisted Conception Unit Manager and one of the unit's Consultant Gynaecologists identified participants for the ACU Waiting List group. The rationale for this was to ensure that the anonymity of all patients registered with the Assisted Conception Unit was maintained. The identified patients were sent an information sheet to read, which explained the nature of the study and encouraged them to contact the researcher or gynaecologist should they have had any further questions, a consent form and a questionnaire booklet for each of the individuals to complete (see Appendix 1). Participants were invited to complete the questionnaires at home and return them to the unit in the envelope addressed to the Unit Manager of the Assisted Conception Unit. The Unit Manager retained the consent forms as these were signed by the individuals and would have revealed their identity to the author, and passed the completed questionnaires onto the researcher for analysis. The matched Control group was then recruited using opportunistic sampling and matched for age, gender, level of education and relationship status as described earlier. The Control group were given an information sheet and questionnaires and consent was assumed if they completed the questionnaires and returned them to the researcher (see Appendix 2).

### **2.4.2 Part two**

This part of the study included couples who were about to be invited to commence a treatment cycle at the Assisted Conception Unit. The potential participants were contacted by the Unit Manager (once again to protect their anonymity from the researcher) and were asked to complete the questionnaire designed to investigate why people in their position may wish not to attend for psychological intervention. These research participants were also asked to complete the BAI, BDI - II, PSS, and IES and demographic information section including questions relating to their age, gender, occupation, level of education and who was the index person. The questionnaires were accompanied by an information sheet explaining the project, which also detailed contact numbers for the researcher and the consultant gynaecologist should the potential research participant require any further information. The documentation requested that the couples indicate specifically that they had agreed to consent to participation in this study (see Appendix 3). A self-addressed envelope for the return of the completed questionnaires was also sent out.

## **2.5 ANALYSIS OF DATA**

### **2.5.1 Data Analysis**

All statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS) for Windows 95, Version 10. Relationships between the groups and variables were calculated using between group t-tests, Chi-square analyses and analysis of variance techniques. Responses remained anonymous throughout the study. Questionnaires were coded only so that each individual could be identified with their partner and to enable clear identification of the ACU Waiting List group and the ACU Treatment group.

### **2.5.2 Statistical Power**

Previous studies investigating distress levels in infertility patients report mostly medium to large effect sizes. Consequently a large effect size was anticipated in the present study. Following discussion with one of the Consultant Gynaecologists and the Unit Manager for the Assisted Conception Unit, where the study took place, it was expected that at least 100 patients could be identified over the four-month time scale of the data collection period of the present study. Allowing for the potential low response rate typically associated with questionnaire designs, the sample size was expected to be at least 30 (couples) in each of the groups. Calculations using Cohen's (1992) criteria on statistical power suggested that a total number of at least 26 individuals would be required in order to detect a large effect size.



## **CHAPTER THREE**

### **RESULTS**

### **3.1 RESULTS FOR PART ONE**

All of the participants in this study were asked to complete the BAI, BDI – II, PSS and the IoE and demographic questions. This section will include analyses examining responses from the ACU Waiting List and the Control group.

#### **3.1.1 Exploration of data**

Prior to statistical analysis the data was explored. Where applicable the data was examined for skewness and kurtosis and transformed where necessary. Any necessary transformations are outlined in detail within the relevant section of this chapter and an explanation of why the transformations were deemed necessary is also included.

#### **3.1.2 Participant Details**

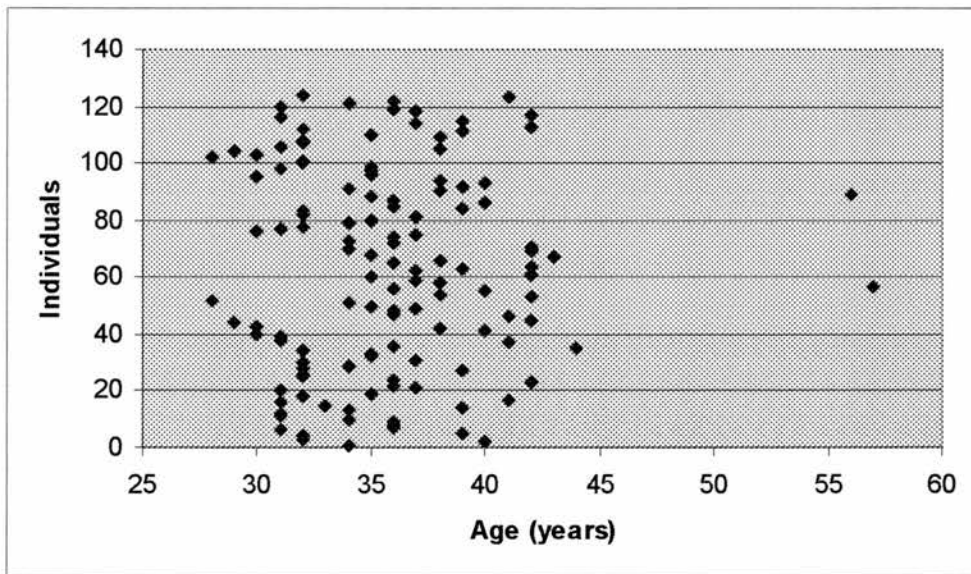
One hundred couples awaiting treatment at the Assisted Conception Unit in Dundee were invited to participate in this study. Thirty-five couples agreed to participate. Unfortunately four couples had to be excluded from the study as they did not both complete the questionnaires correctly. Following this data collection opportunistic sampling led to the collection of the data for the matched Control group from the general population. The Control group included members of the general public who were matched to ACU Waiting List group, individually, on the basis of age, gender, relationship status and level of qualification. Appendix 4 shows age, gender and qualification details of matched individuals for the groups. All individuals were matched exactly on gender and relationship status and, where possible, on age and qualification; when this was not possible they were matched on each variable one

point either side. There were 62 participants in the ACU Waiting List, 31 male and 31 female and the 62 participants in the Control group, 31 male and 31 female.

### 3.1.3 Age

The mean age for the ACU Waiting List group was 35.8 (sd = 4.7). The matched Control group was not expected to differ significantly in age from the ACU Waiting List group and the mean age for the Control group was 35.8 (sd = 4.6).

A scatterplot revealed the two outliers in this data set and further investigation of the levels of skewness and kurtosis revealed that the outliers were causing this data to depart from the Normal. Figure 4 shows the age for all members of both groups.



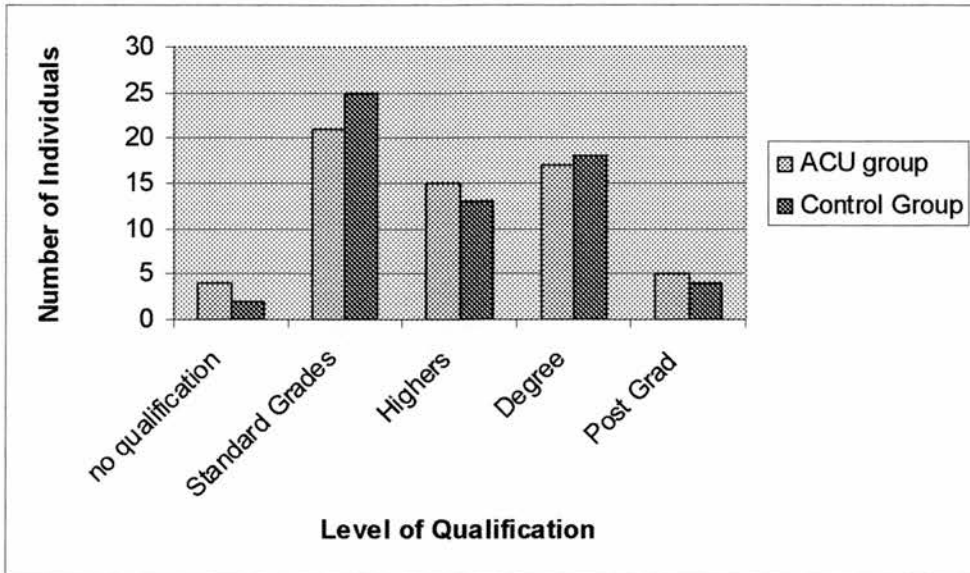
**Figure 4: A scatterplot of the age of each of the individuals in the ACU Waiting List group and the Control group.**

It was decided that the two outliers – who were one male from the ACU Waiting List group and the matched male from Control group should be taken out of the data set

to ensure that the age data did not deviate from the Normal in terms of skewness and kurtosis. Following the elimination of these two individuals from this data set a test for skewness and kurtosis revealed that the data no longer deviated from the Normal and therefore no further transformation was necessary. An independent samples t-test was conducted to establish any differences between the mean age of each group and showed that there were no significant differences.

### **3.1.4 Level of Qualification**

In an attempt to control for any differences in the data set that may be influenced by level of intelligence and socio-economical status each member of the Control group was matched with an individual member of the ACU Waiting List group for level of qualification. For this part of the questionnaire 1 = none; 2= standard grades (or other UK equivalents); 3 = Highers (or other UK equivalents); 4 = Degree; 5 = Post graduate degree. Where an identical match was not possible between the ACU Waiting List group and the Control group the Control group individual was matched one level either side of the level of education of the ACU Waiting List group member. It was important to assess whether this non-identical, yet still relatively strict matching criterion influenced the mean differences between the two groups. Figure 5 shows the number of people for each level of qualification, for both of the groups.



**Figure 5: A graph showing the Number of people, for each of the groups, on each of the different levels of qualification.**

The histogram indicates that there are no large differences between the means of the ACU Waiting List group and the Control group on their levels of qualification.

## 3.2 HYPOTHESES FOR PART ONE OF THE STUDY

### 3.2.1 Hypothesis 1

**The ACU Waiting List group will experience more elevated levels of psychological distress than the Control group.**

To investigate overall distress levels measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms were used. The data for each of these variables was checked for skewness and kurtosis and this investigation revealed that the anxiety and depression scores deviated from the Normal assumptions. Therefore the data were transformed using a  $\log_{10}(X + 1)^*$  transformation for the anxiety scores, and a square root transformation for the depression scores, to enable the assumptions of parametric statistics to be upheld. The means for the ACU Waiting List group and the Control group scores on anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms are compared in Table 3 below along with the results of the one tailed t-test that was conducted for each of these variables.

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\* A  $\log_{10}(X + 1)$  transformation was necessary due to the occurrence of some of the values being equal to zero in this particular data set. Transformation details can be seen in APPENDIX 5.

**Table 3: A table showing the means and standard deviations for the ACU Waiting List group and the Control group and the t-test results for each of the variables.**

Variable	ACU Mean (SD) N=62	Control Mean (SD) N=62	t-value	df	Significance (One-tailed)
BAI	7.18(5.26)	7.27(9.28)	1.29	115	NS
BDI	9.97(5.85)	5.23(6.16)	5.29	117	< <b>0.001</b>
PSS	26.90(7.52)	16.95(8.70)	6.81	122	< <b>0.001</b>
IoE	29.45(13.7)	14.44(15.90)	5.62	122	< <b>0.001</b>

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

It was hypothesised that the ACU Waiting List group would experience more elevated levels of anxiety than the Control group on scores of the Beck Anxiety Inventory. Statistical analysis using a one-tailed t-test revealed no significant differences between these groups. A Post Hoc power analysis using Cohen's (1992) tables revealed that an effect of this size would only reach significance at the 5 % significance level, with a sample size of 393 people in each group.

The ACU Waiting List group was expected to experience more elevated levels of depression than the Control group on scores of the Beck Depression Inventory - II. Statistical analysis using a one-tailed t-test revealed significant differences between these groups ( $t = 5.29$ ,  $df = 117$ ,  $p < 0.001$ ). On examination of the means for the two groups it can be concluded that the ACU Waiting List group members scored significantly higher than the Control group members.

The ACU Waiting List group were expected to experience more elevated levels of stress than the Control group on scores of the Perceived Stress Scale. Statistical analysis using a one-tailed t-test revealed significant differences between these groups ( $t = 6.81$ ,  $df = 122$ ,  $p < 0.001$ ). On examination of the means for the two groups it can be confirmed that the ACU Waiting List group members scored significantly higher than the Control group members.

Finally, it was expected that the ACU Waiting List group would experience more elevated levels of intrusion and avoidance symptoms than the Control group on scores on the Impact of Events Scale. Statistical analysis using a one-tailed t-test revealed significant differences between these groups ( $t = 5.62$ ,  $df = 122$ ,  $p < 0.001$ ). On examination of the means for the two groups it can be concluded that the ACU Waiting List group members scored significantly higher than the Control group members.

As a note of caution it should be emphasised that although there is a significant difference between the group means on the BDI, PSS and IoE these overall means remain below the recommended symptomatic levels of cut-off. Interestingly, although not significantly different for the group means, the levels of anxiety were just under the recommended symptomatic cut-off for both of the group means.



### 3.2.2 Hypothesis 2

**There will be a higher incidence of ‘caseness’ in the ACU Waiting List group than the Control group.**

To investigate the levels of caseness, measures of anxiety, depression, perceived stress and intrusions and avoidance symptoms were used. The number of individuals that reached ‘caseness’ for the ACU Waiting List group and the Control group on anxiety, depression, perceived stress and intrusions and avoidance symptoms are compared in Table 4 below along with the results of the Chi-square test that was conducted for each of these variables.

**Table 4: A table showing the number of individuals that reached caseness for the ACU Waiting List group and the Control group on each assessment, two or more of the assessment and all of the assessments and the results of a Chi-square analysis for each variable.**

Variable	Caseness ACU (N=62)	Caseness Control (N=62)	X <sup>2</sup>	df	Significance (Two-tailed)
BAI	24	19	0.89	1	NS
BDI	19	4	12.01	1	<b>P&lt;0.001</b>
PSS	20	10	28.01	1	<b>P&lt;0.001</b>
IoE	40	11	4.39	1	<b>P&lt;0.05</b>
2 or more	34	10	20.29	1	<b>P&lt;0.001</b>
All variable	6	3	2.13	1	NS

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

It was hypothesised that there would be a higher incidence of caseness of anxiety in the ACU Waiting List group. Caseness on the BAI was taken to be scores > 7 in agreement with the 1993 edition of the manual (Beck and Steer, 1993). Statistical

analysis using the Chi-square test revealed no significant differences between these two groups. A Post Hoc power analysis of the anxiety data facilitated by Cohen's (1992) tables revealed that an effect of this size would only be significant at the 5 % significance level with 785 individuals in each group.

It was expected that there would be a higher incidence of caseness for depression in the ACU Waiting List group than the Control group as measured by the Beck Depression Inventory - II. Caseness on the BDI-II was considered if the score was > 13 according to the 1996 edition of the manual (Beck et al, 1996). Statistical analysis using a Chi-square test revealed significant differences between these groups ( $X^2 = 12.01$ ;  $df = 1$ ;  $p < 0.001$ ). On examination of the number of individuals that reached caseness for each of the two groups it can be concluded that the ACU Waiting List group members reached caseness more frequently than the Control group members.

A statistically higher incidence of caseness for perceived stress in the ACU Waiting List group was expected as measured by the Perceived Stress Scale. Caseness on this scale was considered to be any score > 27. Although no specific cut off scores are outlined by the authors (Cohen et al, 1983) they detail the mean and standard deviations from a population sample of random sample of people. The cut off score in this study is one standard deviation above the mean outlined in the manual. In a normal distribution, one in every six people would be expected to fall one standard deviation or more above the mean, thus this cut-off might be expected to many normal individuals. However, this would be the case for both of the groups being examined and was considered appropriate to this study. Statistical analysis using a Chi-square test revealed significant differences between these groups ( $X^2 = 28.01$ ;  $df$

= 1;  $p < 0.001$ ). On examination of the number of individuals that reached caseness for each of the two groups it can be concluded that the ACU Waiting List group members reached caseness more frequently than the Control group members.

Finally, a higher incidence of caseness for intrusion and avoidance symptoms in the ACU Waiting List group was anticipated as measured by the Impact of Events Scale. Caseness on this scale was considered if scores  $> 40$ . Although the authors of this assessment detail no specific cut off scores, they recommend that this value may be used as a guide to caseness (Horowitz et al, 1979). Statistical analysis using a Chi-square test revealed significant differences between these groups ( $X^2 = 4.39$ ;  $df = 1$ ;  $p < 0.05$ ). On examination of the number of people that reached caseness for each of the two groups it can be concluded that the ACU Waiting List group members reached caseness more frequently than the Control group members.

There was a significant difference between the ACU Waiting List group and the Control group with regard to the number of individuals who reached clinical caseness on two or more of the measures, ( $X^2 = 20.29$ ;  $df = 1$ ;  $p < 0.001$ ). The means of these two groups indicate a higher level of caseness in the ACU Waiting List group than in the Control group. There was no significant difference between the ACU Waiting List group and the Control group on the number of individuals who reached clinical caseness on all of the measures. However double the number of people reached caseness in the ACU Waiting List group than in the Control group. This difference may have reached statistical significance in the anticipated direction and power calculations will be considered in the discussion.

### 3.2.3 Hypothesis 3

**Women experience more distress than men regardless of whether the male receives direct medical treatment.**

Couples were asked to indicate which partner was to receive direct treatment or whether both of them were. All of the women that responded received treatment and only 16% of the men that responded received treatment. This is representative of assisted conception patients as it is rarely the case that a male would receive treatment without the female receiving some form of treatment. For this analysis the person who receives treatment for infertility is known as the Index person. The means and standard deviations for each of the different groups are outlined below in Table 5.

**Table 5: Table showing the mean and standard deviations for each of the tested variables for the different groups of males and females index and non-index for the ACU Waiting List group.**

Variable	Females Mean (sd) N = 31	Male Non-Index Mean(sd) N = 26	Male Index Mean(sd)N = 5
BAI	9.9(5.53)	3(4.12)	4.73(5.03)
BDI	12.97(5.49)	6.8(6.22)	7(4.35)
PSS	36(10.5)	24(19.13)	22.65(12.69)
IOE	29.32(6.78)	23.8(10.69)	24.61(7.07)

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

The data for each of these variables was checked for skewness and kurtosis and this investigation revealed that the anxiety scores deviated from the Normal assumptions. This investigation revealed high kurtosis and a positive skew. Although it was considered that this kurtosis and skewness could be more representative of a floor

effect, the data was transformed using a log 10 ( $X + 1$ ), to enable the assumptions of parametric statistics to be upheld.

A factorial analysis of variance (ANOVA) was conducted for each of the variables to examine the main effects of Gender and Index for each of the scores relating to individual assessment measures and to assess any interactions between these two factors. There were no significant main effects of Index and no significant interaction between Index and Gender on any of the variables.\* There were however significant effects of Gender and these effects are outlined for each variable below in Table 6.

**Table 6: A table showing the significant effects of Gender for each of the variables as calculated by the ANOVA analysis.**

Variable*Gender	F	df	Significance (One/Two-tailed)
BAI	3.38	1,62	<b>P &lt;0.001</b>
BDI	10.20	1,62	<b>P &lt;0.01</b>
PSS	2.5	1,62	NS
IoE	4.18	1,62	<b>P &lt;0.05</b>

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

It was hypothesised that there would be a statistically significant effect of Gender on the Beck Anxiety Inventory but no effect of Index and no interaction between Index and Gender. Statistical analysis using a factorial ANOVA test revealed a significant effect of Gender only ( $F = 3.38$ ;  $df = 1$ ;  $p < 0.001$ ). On examination of the means for

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\* All transformations and non-significant analyses can be located in APPENDIX 5.

the two groups it can be concluded that women scored significantly higher than men on the BAI regardless of whether the man receives direct treatment.

A statistically significant effect of Gender on the Beck Depression Inventory – II, was expected but no effect of Index and no interaction between Index and Gender. Statistical analysis using a factorial ANOVA test revealed a significant effect of Gender only ( $F = 10.2$ ;  $df = 1$ ;  $p < 0.01$ ). On examination of the means for the two groups it can be concluded that the women scored significantly higher than men on the BDI-II regardless of whether the man receives direct treatment.

A significant effect of Gender on the Perceived Stress Scale was anticipated but no effect of Index and no interaction between Index and Gender. Statistical analysis using a factorial ANOVA test revealed no significant effect of Gender or Index and no interaction between Index and Gender. On examination of the means however it can be concluded that there was a trend in the hypothesised direction.

Finally, it was hypothesised that there would be a statistically significant effect of Gender on the Impact of Events Scale but no effect of Index and no interaction between Index and Gender. Statistical analysis using a factorial ANOVA test revealed a significant effect of Gender only ( $F = 4.18$ ;  $df = 1$ ;  $p < 0.05$ ). On examination of the means for the two groups it can be concluded that women scored significantly higher than men on the IoE regardless of whether the man receives direct treatment.

Although the factorial ANOVA revealed no significant effect of Gender on the scores of the Perceived Stress Scale there was a trend in the predicted direction - of women having higher scores on the Perceived Stress Scale than men in this group. A Post Hoc power analysis with the use of Cohen's (1992) tables revealed that for an effect

of this size to reach statistical significance at the 5 % significance level 67 people would be required in each group.

These results mainly support the hypothesis that women's psychological well being is more affected than that of their partner. The failure to detect any effect of who receives direct medical treatment indicated that women are more affected by infertility regardless of whether or not the male receives treatment.

### 3.2.4 Hypothesis 4

#### **Older women will be more psychologically distressed than younger women.**

It was hypothesised that older women would score more highly on the Beck Anxiety Inventory, Beck Depression Inventory-II, Perceived Stress Scale and Impact of events scale than younger women. To assess this hypothesis, women were categorised into an older group or a younger group. It has been shown that a woman's fertility declines from the age of 35 onwards. Based on this finding the older group contained women who were 35 years of age or older and the younger group contained women who were 34 years of age or younger.

Analysis of the data revealed that the variables measuring levels of psychological distress were in agreement with the assumptions of Normality and therefore no transformation was necessary. To assess this hypothesis a one-tailed t-test was used to examine any differences between the group means. Table 7 shows the means and standard deviation for each of the groups on each of the variables and the results of the t-test analyses.

**Table 7: A table showing the means and standard deviations for the Younger group (<35 years) and Older group (>34 years) and the t-test results for each of the variables.**

Variable	Younger Group Mean(SD) N=15	Older Group Mean(SD) N=16	t-value	df	Significance (one-tailed)
BAI	10.7(5.4)	9.1(5.7)	0.805	29	NS
BDI	14.5(6.3)	11.4(4.3)	1.50	29	NS
PSS	31.9(6.0)	26.9(6.8)	2.14	29	NS
IoE	38.8(12.0)	33.4(8.6)	1.45	29	NS

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.



It was hypothesised that older women would score higher on the Beck Anxiety Inventory than younger women. Statistical analysis using a one-tailed t-test revealed no significant differences between these groups.

The hypothesis suggests that older women should score higher on the Beck Depression Inventory - II than younger women. Statistical analysis using a one-tailed t-test revealed no significant differences between these groups.

Older women were also expected to attain higher scores on the Perceived Stress Scale than younger women. Statistical analysis using a one-tailed t-test revealed no significant difference between these groups in the anticipated direction.

Finally, it was hypothesised that older women would score higher on the Impact of Events Scale than younger women. Statistical analysis using a one-tailed t-test revealed no significant differences between these groups.

The means indicate that younger women experience more psychological distress than older women. A post hoc examination of these differences using a one-tailed t-test revealed a significant difference between these groups ( $t = 2.14$ ;  $df = 29$   $p < 0.05$ ) on the measure of perceived stress. It can therefore be concluded that younger women perceive themselves to be more stressed than the older women. Although the other analyses did not reach statistical significance it can be seen that there is a trend in the same direction; younger women tend to be more psychologically distressed than older women, for each of the variables.

### 3.2.5 Hypothesis 5

**The number of treatment cycles previously experienced will influence the woman's level of psychological distress regardless of her age.**

Measures of anxiety, depression, perceived stress and intrusion and avoidance symptoms were used to assess psychological distress. Analysis of the data revealed that the variables measuring levels of psychological distress were in agreement with the assumptions of Normality and therefore no transformation was necessary. It was hypothesised that women who had experienced two or more treatment cycles would experience more psychological distress than those who had only experienced one or no treatment cycles.

The means and standard deviations for each of the different groups are outlined below in Table 8.

**Table 8: Table showing the mean and standard deviations for each of the tested variables for the old and young women.**

	One or less cycles		Two or more cycles	
	Young Mean (sd) N = 10	Old Mean (sd) N= 8	Young Mean (sd) N = 5	Old Mean (sd) N = 8
BAI	9.8(5.1)	7.2(3.88)	12.6(6.1)	11(8)
BDI	12.9(6.3)	9(8)	17.6(5.5)	14.1(3.44)
PSS	30.1(5.5)	24.6(5.8)	35.4(5.7)	29.3(17.3)
IOE	34.9(11.3)	35.1(9.1)	46.6(10.)	31.75(7.9)

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

A factorial ANOVA was conducted for each of the variables to examine the main effects of Number of Cycles and Age for each of the sets of scores from the individual assessment measures and to assess any interactions between these two factors.\* Table 9 below shows only the significant results of each of the factorial ANOVAs conducted.

**Table 9: A table showing the effects on each of the variables and the results of the factorial ANOVA analysis.**

Variable	Significant Effects	F	df	Significance
BAI	No sig effects			NS
BDI - II	No. of Cycles	7.19	1,31	<b>P &lt; 0.05</b>
PSS	No sig effects			NS
IoE	Age*No. Cycles	4.32	1,31	<b>P &lt; 0.05</b>

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

A statistically significant effect of the number of treatment cycles that a women experiences on their levels of anxiety regardless of their age, as measured by the Beck Anxiety Inventory was expected. Statistical analysis using a factorial ANOVA revealed no effect of Number of Cycles, no main effect of Age and no interaction between these two variables. On examination of the means for the two groups it can be concluded that there is a trend for younger women to report more anxiety and in addition to this there is a trend for women who have experienced two or more treatment cycles to report elevated levels of anxiety. However these trends do not reach statistical significance.

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\* See APPENDIX 5 for non-significant calculations.

It was also expected that there would be a statistically significant effect of the number of treatment cycles that a women experiences on their levels of depression regardless of their age, as measured by the Beck Depression Inventory - II. Statistical analysis using a factorial ANOVA revealed a significant effect of Number of Cycles ( $F = 7.19$ ;  $df = 1$ ;  $p < 0.05$ ), there was no significant main effect of age and no interaction between the two factors. On examination of the means for the two groups it can be concluded that women who have experienced two or more treatment cycles have significantly elevated levels of depression when compared to women who have had one or less cycles. There is a trend for younger women to be more psychologically distressed than older women although this trend did not quite reach statistical significance. There is also no statistically significant interaction between these two factors.

It was hypothesised that there would be a statistically significant effect of the number of treatment cycles that a women experiences on their perceived levels of stress as measured by the Perceived Stress Scale, regardless of their age. Statistical analysis using a factorial ANOVA revealed no effect of Number of Cycles, no effect of age and no interaction between these two variables. On examination of the means for the two groups it can be concluded that there is a trend for younger women to perceive themselves as more stressed. In addition to this there is a trend for women who have experienced two or more treatment cycles to report elevated levels of perceived stress. These trends do not reach statistical significance in this analysis.

Finally, it was anticipated that there would be a statistically significant effect of the number of treatment cycles that a women experiences on their levels of intrusions and

avoidance symptoms, regardless of their age. Intrusions and avoidance symptoms were measured using the Impact of Events Scale. Statistical analysis using a factorial ANOVA revealed no effect of Number of Cycles, no main effect of age but a significant interaction between these two variables ( $F = 4.32$ ;  $df = 1$ ;  $p < 0.05$ ). On examination of the means for the two groups it can be concluded that there is a trend for women who have experienced two or more treatment cycles to report elevated levels of perceived stress. There is also a trend for younger women to perceive themselves as more stressed. On examination of the profile (see Appendix 5) for the interaction between the two variables it can be seen that older women experience more intrusions and avoidance symptoms than younger women when they have only experienced one or less treatment cycles. In addition, younger women experience more stress than older women do when they have experienced two or more treatment cycles.

These results do not fully support the hypothesis although there is a trend for women who have experienced more than one treatment cycle to be more psychologically distressed than those who have experienced one or less. This trend reaches statistical significance for scores of depression indicating that women who have experienced more than one treatment cycle will be more depressed than those who have experienced one or less, regardless of whether they are young or old.

A Post Hoc power calculation for the variables of anxiety and perceived stress revealed that 481 individuals would be required in this group for the trends to reach significance at the 5 % significance level.

### 3.2.6 Summary

A number of analyses were conducted to compare results from the ACU Waiting List group and a matched Control group from the general population. There were also analyses within the ACU Waiting List group investigating the dynamics of this population. Overall the analyses revealed a number of significant findings. The data supports the hypothesis that people undergoing assisted conception have higher levels of depression, stress and intrusions and avoidance symptoms than the matched general population Control group. The data also revealed that people undergoing assisted conception reach clinical caseness on all of the assessment measures, except that measuring anxiety, significantly more often than the general population. Further analyses supported the hypothesis that women are more affected than men by assisted conception even when the male partner is also receiving treatment. Although the analyses did not reach statistical significance for the measures of anxiety, perceived stress and intrusions and avoidance symptoms, it appears that younger women experience more psychological distress when the cut off age for old is set at 35 years of age. The results also indicate that the number of treatment cycles previously experienced has an influence on the women's levels of depression regardless of their age.

### **3.3 RESULTS FOR PART TWO OF THE STUDY**

All of the participants in this part of the study were asked to complete the same questionnaires as the participants in Part I of this study: Beck Anxiety Inventory, Beck Depression Inventory - II, Perceived Stress Scale and the Impact of Events scale. In addition, participants were asked to complete the questionnaire that was designed by the researcher, which aimed to investigate an individual's reasons for not wishing to attend a Stress Management Program.

#### **3.3.1 Participant details**

All participants were approached via mail to participate in this part of the study. There were ethical problems relating to asking the same couples who had been invited to the stress management groups. Their failure to respond could have indicated refusal to participate in the study. It was decided to replicate this stage with a new group of individuals comprising of couples who were just about to begin a new fertility cycle.

Eighty couples who had just received an invitation to attend the Assisted Conception Unit to begin a new cycle of treatment were invited to participate. Twenty-seven couples responded positively, yielding a total response rate of 34 %. This is very similar to the response rate to that of Part I of the study (35%) and about what would be expected for a postal questionnaire of this sort. Unfortunately three of the couples' responses could not be used in the final analysis as either the questionnaires were not completed by both partners or they were completed incorrectly. Therefore 24 couples participated in this study. This group of individuals will be referred to throughout the analysis as the ACU Treatment group.

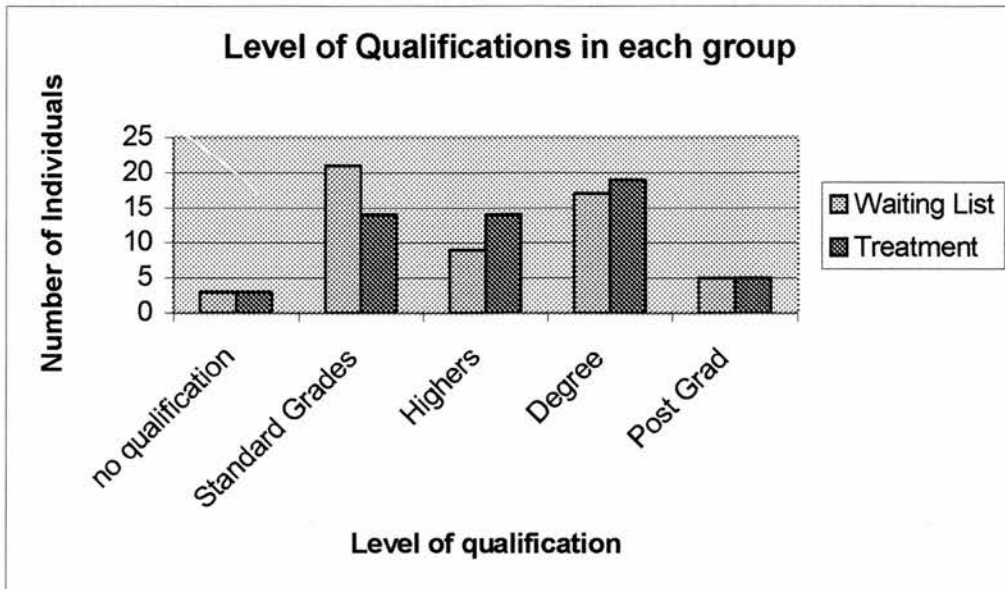
### **3.3.2 Age**

A scatterplot of the age of individuals in the ACU Treatment group showed that there were no obvious outliers for this data set for the men's age plot, the women's age plot and the overall age plot. The overall mean age for the Treatment group was 33.8 (SD = 4.07). The mean age for the male participants was 37.25 (SD = 0.90) and for the female participants was 34.5 (SD = 0.66). The data for age was screened for kurtosis and skewness and there were no significant deviations from the Normal distribution. The data set for age for the ACU Treatment group was not expected to differ significantly from the data set attained previously for the ACU Waiting List group and an independent samples t-test found no significant differences between these two groups.

### **3.3.3 Level of Qualification**

Individuals were asked to indicate the highest level of qualification they had attained. Figure 6 below shows the percentages from the ACU Treatment group and the ACU Waiting List group that attained each level of qualification.





**Figure 6: Graph showing the number of individuals for each qualification category for the ACU Treatment group and the ACU Waiting List group.**

It was expected that the level of qualification for the ACU Treatment group would not differ significantly from the data set obtained from the ACU Waiting List group and the histogram above reveals no large differences. Education levels are higher than one might expect in the general population (nearly one in four with degree or higher). This may reflect a genuine difference in the overall assisted fertility population or may be an artefact of better educated individual's being more likely to participate.

### **3.3.4 Exploration of the Questionnaire on reasons for non-attendance at stress management programs**

The procedure outlining the methodology involved in the creation of this questionnaire is detailed in the Methods section of this study and a copy of the questionnaire can be found in Appendix 3. Each question was assessed to ensure that it was not superfluous and asking essentially the same thing as another question.

Participants in the ACU Treatment group were asked to rate 28 different reasons to explain why they may not wish to attend a stress management program and indicate whether each individual explanation may be a major reason, a minor reason or not a reason for their non-attendance. The individual reasons were designed to encompass seven main factors. A correlation matrix was used to establish whether individual reasons correlated with the other reasons in each of the seven factors. Ideally a factor analysis would have been preferred for this analysis but there were insufficient responses to enable this calculation to be performed. Table 10 shows a summary of the results of the correlation matrix and estimations of the internal consistency for each of the factors.

**Table 10: Table showing the number of significant correlations between individual items for each of the factors and the related Cronbach alpha coefficient.**

Factor	No. Items	No. of Sig Correlations	Cronbach’s alpha
Financial / Practical	4	6/6 at p< 0.01	<b>0.8795</b>
Medical View of Problem	4	6/6 at p <0.01	<b>0.789</b>
Group Issues	4	6/6 at p <0.01	<b>0.865</b>
Stigma Issues	4	5 / 6 at <0.01	<b>0.8178</b>
Stress Issues	4	5 / 6 at p < 0.01	<b>0.8178</b>
Negative Cog. Biases	4	2 / 6 at p < 0.01	0.318
Motivational Issues	4	1 /6 at p < 0.05	0.277

As outlined in the above table many of the factors assessed showed good correlations between individual factors and good Cronbach alpha scores, indicating good internal consistency. However the final two factors did not show good internal consistency and the correlation between the individual factors was poor. The overall reliability for this assessment measured based on the forty-eight responses from participants and twenty-eight questions gives a Cronbach’s alpha coefficient of 0.8285.

### 3.4 HYPOTHESES FOR PART TWO OF THE STUDY

Hypothesis 6 and 7 relate to both the Waiting List group and the ACU Treatment group. Hypotheses 8 and 9 relate only to the ACU Treatment group.

#### 3.4.1 Hypothesis 6

**Levels of distress in the ACU Treatment group will be higher than the levels of distress in the ACU Waiting List group.**

It was proposed that being invited to attend the clinic to commence a new treatment cycle would be more stressful than awaiting treatment. Measures of anxiety, depression, perceived stress and intrusions and avoidance symptoms were administered to the group of patients who had recently been invited to attend the assisted conception group for treatment. The data was scanned for levels of Kurtosis and Skewness and this investigation revealed that that the anxiety and depression scores deviated from the assumptions of Normality. Therefore the data were transformed using a Square root transformation for the anxiety scores and the depression scores, to enable the assumptions of parametric statistics to be upheld.\* The means for the ACU Waiting List group and the Treatment group on anxiety, depression, perceived stress and intrusions and avoidance symptoms are compared in Table 1111 below along with the results of the independent samples t-test that was conducted for each of these variables.

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\* See APPENDIX 6 for details of transformations.

**Table 11: A table showing the means and standard deviations for the ACU group and the Treatment group and the t-test results for each of the variables.**

Variable	Waiting List Group Mean (SD) N=62	Treatment Group Mean (SD) N=48	t-value	df	Significance (One-tailed)
BAI	7.18(5.26)	9.89(8.43)	-1.897	108	NS
BDI	9.97(5.85)	11.63(9.08)	-0.502	108	NS
PSS	26.90(7.52)	24.85(7.57)	1.41	108	NS
IoE	29.45(13.72)	26.13(14.36)	1.24	108	NS

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Percieved Stress Scale and IoE = Impact of Events Scale.

No significant differences were established on any of the variables between the ACU Waiting List group and the ACU Treatment group.

### 3.4.2 Hypothesis 7

**Women will experience more psychological distress than men regardless of whether they are awaiting treatment or are starting a treatment cycle.**

It was suggested that females would have more elevated scores on measurements of anxiety, depression, stress and intrusions and avoidance symptoms than would men regardless of what stage of treatment they are at.

To investigate the level of psychological distress the BAI, BDI - II, PSS and IoE were used. On examination of the data it was apparent that there was a positive Skewness and high Kurtosis for the variables of anxiety and depression. Therefore a square root transformation was employed, which successfully adjusted these data to be within the assumptions of Normality.\* Table 12 shows the means and standard deviations for each of the two groups on all of the measures for men and women.

**Table 12: A table showing the means and standard deviations for men and women in each of the groups for all of the measured variables.**

Variable	ACU waiting list group		ACU Treatment group	
	Female Mean (sd) N = 31	Males Mean (sd) N = 31	Female Mean (sd) N = 24	Male Mean (sd) N = 24
BAI	9.9(5.53)	4.45(3.21)	11.04(9.65)	8.73(7.02)
BDI	12.97(5.49)	6.97(4.57)	13.73(10)	9.5(7.67)
PSS	36(10.50)	24.48(7.55)	24.42(8.63)	25.29(6.85)
IOE	29.32(6.78)	22.87(13.54)	32.08(13)	20.17(13.30)

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

\* See APPENDIX 6 for details of transformations.

A factorial ANOVA was conducted for each of the variables to examine the effects of Gender and Group for each assessment measure and to assess any interactions between these two factors.\* The significant effects, F values, and significance levels for each of the variables are given in Table 13.

**Table 13: A table showing the main effects on each of the variables and the results of the ANOVA analysis.**

Variable	Main effects & Interactions	F	df	Significance (One/Two-tailed)
BAI	Gender	11.61	1,110	<b>P &lt; 0.001</b>
	Group	4.12	1,110	<b>P &lt; 0.05</b>
	Gender * Group	4.12	1,110	<b>P &lt; 0.05</b>
BDI	Gender	18.00	1,110	<b>P &lt; 0.001</b>
PSS	Gender * Group	4.54	1,110	<b>P &lt; 0.05</b>
IoE	Gender	26.85	1,110	<b>P &lt; 0.001</b>

BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, PSS = Perceived Stress Scale and IoE = Impact of Events Scale.

It was hypothesised that there would be a statistically significant effect of Gender on scores of the Beck Anxiety Inventory but no effect of Group and no interaction between Group and Gender. However, statistical analysis using a factorial ANOVA test revealed a significant effect of Gender ( $F = 11.6$ ;  $df = 1$ ;  $p < 0.001$ ), a significant effect of Group ( $F = 4.1$ ;  $df = 1$ ;  $p < 0.05$ ) and a significant interaction between these two ( $F = 4.1$ ;  $df = 1$ ;  $p < 0.05$ ). On examination of the profile for this analysis (see Appendix 6 for profile) it can be concluded that the women scored significantly higher

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\* For details of non-significant results see APPENDIX 6.

than the men in both of the groups and that men in the ACU Treatment group scored more highly than the men in the ACU Waiting List group.

It was also expected that there would be a statistically significant effect of Gender on depression, as measured by the Beck Depression Inventory – II, but no effect of Group and no interaction between Group and Gender. As hypothesised, statistical analysis using a factorial ANOVA test revealed a significant effect of Gender only ( $F = 18$ ;  $df = 1$ ;  $p < 0.01$ ). On examination of the means for the two groups it can be concluded that the female members scored significantly higher on the BDI - II than the male group members regardless of what stage of treatment they are at.

The hypothesis suggests that there should be a significant effect of Gender on the levels of stress, as measured by the Perceived Stress Scale, but no effect of Group and no interaction between Group and Gender. Statistical analysis using a factorial ANOVA test revealed no significant effect of Gender and no significant effect of Group. There was however a significant interaction between Gender and Group ( $F = 4.5$ ;  $df = 1$ ;  $p < 0.05$ ). On examination of the profile (see Appendix 6) it is clear that women score more highly than men in the ACU waiting group but that men score more highly than women in the ACU Treatment group. This suggests that women perceive themselves to be more stressed when awaiting treatment than when receiving treatment but that men perceive themselves to be more stressed when the couple have started a treatment cycle.

Finally, it was anticipated that there would be a significant effect of Gender on the experience of intrusions and avoidance, as measured by the Impact of Events Scale, but no effect of Group and no interaction between Group and Gender. As

hypothesised, statistical analysis using a factorial ANOVA test revealed a significant effect of Gender only ( $F = 26.85$ ;  $df = 1$ ;  $p < 0.001$ ). On examination of the means for the two groups it can be concluded that women scored significantly higher than did the men regardless of the whether they were awaiting treatment or about to receive treatment.

These results mainly support the hypothesis that women's psychological well being is more affected than that of their partner regardless of the stage of treatment. Women are more depressed and experience more intrusions and avoidance symptoms than men regardless of what stage of treatment they are at. However, although women experience more anxiety overall, men experience more anxiety when the couple are receiving treatment. In addition women experience more stress than men do waiting for the offer of a treatment cycle whereas men experience more stress than women do after having been offered a treatment cycle.

### 3.4.3 Hypothesis 8

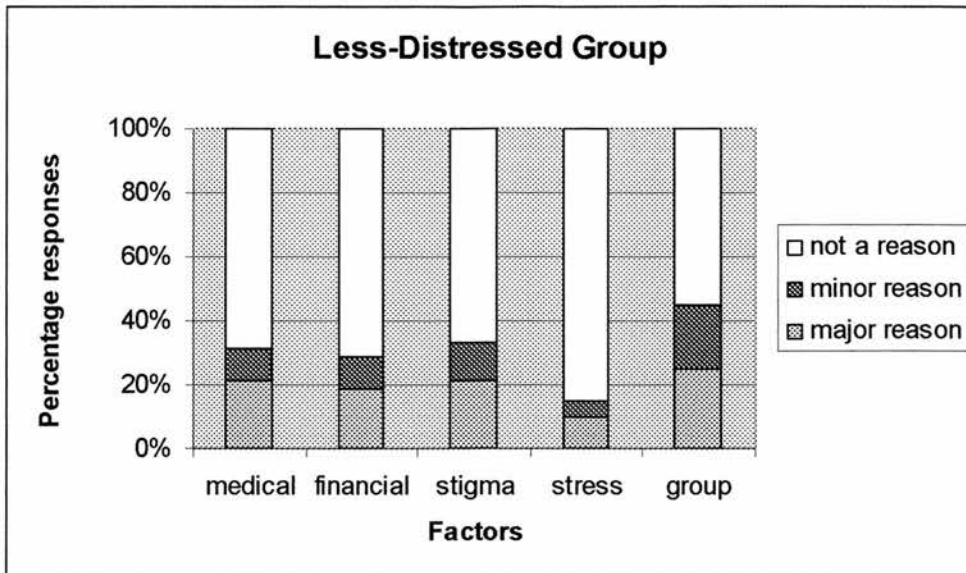
**Distressed individuals' reasons for non-attendance at a stress management program will be different to less-distressed individuals' reasons for non-attendance.**

Categorising the respondents into either a distressed group or a less-distressed group enabled this hypothesis to be tested. An individual was categorised as distressed if they reached caseness on two or more of the psychological measures of anxiety, depression stress and intrusions and avoidance symptoms. If the individual reached caseness on only one or none of the psychological measures they were categorised as

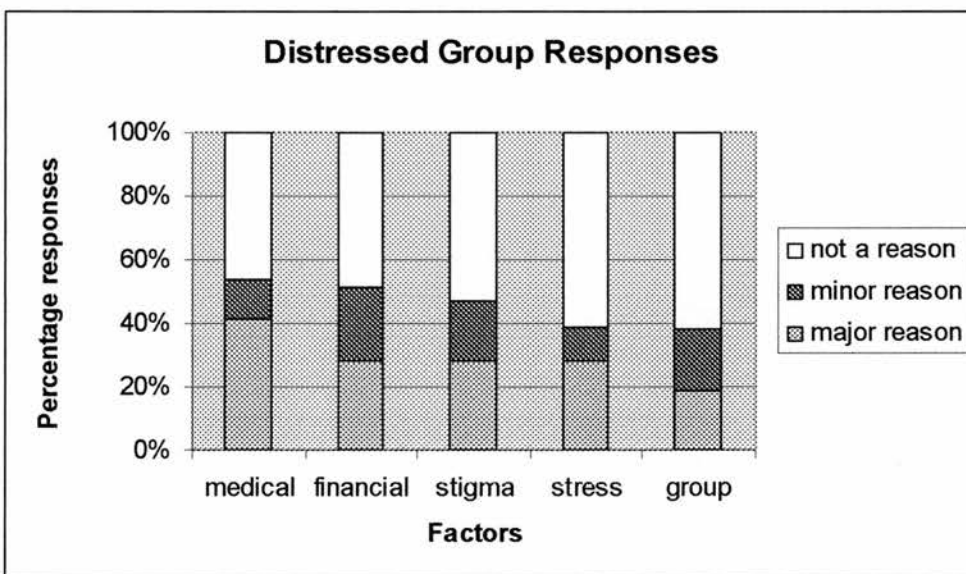


less-distressed. It was recognised that reaching caseness on one measure alone could be classed as distressing but this hypothesis aimed to examine whether there was any effect of experiencing multiple levels of distress, as suggested by Boivin et al (1999). There were 23 individuals in the less-distressed group, 14 males and 9 females. The average age of the distressed group was 35.39 (sd 4.13). There were 25 individuals in the distressed group, 10 males and 15 females. The average age of the distressed group was 36.32 (sd 4.01). A t-test revealed that the groups did not differ significantly in age and a Chi-square test revealed that there were no significant differences in the number of males and females in each of the group.

There were originally 7 factors that were designed for this questionnaire and each factor had 4 corresponding individual items. However, only 5 of the factors had reasonable correlations between 5 the individual items. Therefore the 2 factors (Negative Cognitive Bias & Motivational Issues) with little correlations amongst the individual items and low Cronbach alpha coefficients have been discarded from any further analysis. The data was plotted using a histogram to enable an initial visual investigation of any differences in responses between the distressed group and the less-distressed group. Figure 7 and Figure 8 below show the percentage of responses from the distressed group and the less-distressed group to each of the factors.



**Figure 7: Percentage of responses for reported reasons for non-attendance amongst the Less-Distressed group.**



**Figure 8: Percentage of responses for reported reasons for non-attendance amongst the Distressed group.**

The difference between the two groups on each of the factors was assessed using a Chi-square analysis. Table 144 shows the percentage of each group that attributed

each of the factors as being a major reason as to why they may not wish to attend a stress management program.

**Table 14: Table showing the percentage of each groups' responses for each of the factors being a major reason for non-attendance at a stress management program, and results of the Chi-square analysis for each of the factors.**

Factor	Less-Stressed Group N= 23	Stressed Group N=25	X <sup>2</sup>	df	Significance (Two-tailed)
Financial	19	28	2.78	1	NS
Medical	21	41	10.30	1	<b>P&lt;0.01</b>
Stress	10	28	11.73	1	<b>P&lt;0.001</b>
Stigma	21	28	1.73	1	NS
Group	19	25	0.73	1	NS

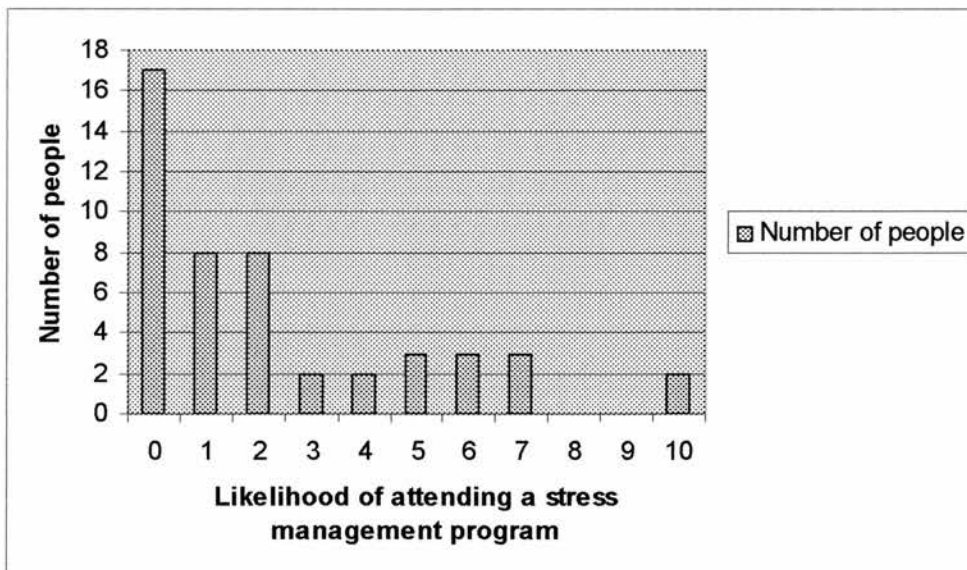
The table above indicates that there was a trend for the distressed group to attribute each of the factors as being a major reason for non-attendance at a stress management program more frequently than the less-distressed group. This difference in group responses reached statistical significance as measured by the Chi-square analysis for the factors Medical view of fertility problem ( $X^2 = 10.3$ ;  $df = 1$ ;  $p < 0.01$ ) and for Stress Control Issues ( $X^2 = 11.73$ ;  $df = 1$ ;  $p < 0.05$ ). This indicates that the distressed group view their fertility problem as medical more often than the less-distressed group. In addition, the stressed group identify medical as a major reason for not attending a stress management program more often than the less-distressed group. There was no statistical difference between the two groups on their likelihood of rating issues relating to the Group dynamic, Stigma issues related to seeking help from a psychologist and Financial and Practical reasons as major reasons for non-attendance at a stress management program.

### 3.4.4 Hypothesis 9

**The distressed group will be more likely to want to attend a stress management program than the less-distressed group.**

In this study it was suggested the distressed group would be more likely to indicate that they would like to attend a stress management group than the less-distressed group. The distressed and less-distressed groups were categorised in the same way as for Hypothesis 8. They were asked to rate the likelihood of them accepting the offer of a stress management program in the main questionnaire.

A spread of the responses to this question is illustrated in Figure 9.



**Figure 9: The number of people that rated the likelihood of them attending the stress management group from 0 – 10.**

For the purpose of this analysis the results were then categorised into those who may wish to attend in the future and those who would not wish to attend at any stage in the future. Wishing to attend was categorised as any score including and greater than

five and not wishing to attend was categorised as any score between and including zero and four. A Chi-square analysis was used to examine this hypothesis. The number of individuals that fell into each category are outlined in Table 15 below.

**Table 15: Influence of distress level upon self-reported likelihood of attending a stress management program.**

	Not caseness on 2 measures Less-distressed (N = 23)	Caseness on 2 measures Distressed (N=25)
Did not wish to attend	17 (74%)	20 (80%)
May wish to attend	6 (26%)	5 (25%)

Table 15 emphasises that the majority of individuals suggested that they would not like to become involved in a stress management program (77% overall). A Chi-square analysis of this data indicated that there was no significant difference between the two groups (distressed and less-distressed) in the number of people who suggested that they would be interested in attending a stress management program, ( $X^2 = 0.251$ ;  $df = 1$ ;  $p > 0.05$ ). This suggests that the level of distress experienced by an individual does not ultimately effect their decision on whether or not to attend a stress management program.

### 3.4.5 Summary

This part of the study involved individuals that were attending the Dundee Assisted Conception Unit to begin a new treatment cycle and those who were on the Waiting List to fertility receive treatment at the Unit. The ages and levels of qualifications between the two samples were found not to differ significantly. The study examined

reasons for potential non-attendance at a stress management program using a questionnaire designed specifically for this purpose. The individual items relating to two factors within the questionnaire were found to not correlate well and these factors were subsequently discarded from any further analysis.

There were no significant results to support the hypothesis that the ACU Treatment group would experience more psychological distress than the ACU Waiting List group.

The results indicated that women experience more elevated levels of anxiety, depression and stress than men regardless of whether they were awaiting treatment or receiving treatment. It was found however, that men experience an increased level of stress and anxiety when the couple are receiving treatment.

On analysis of the data examining the reasons for non-attendance at a psychologist-led stress management program, a trend was found for the distressed group to be more likely to assign major reasons for non-attendance than members of the less-distressed group. This trend reached statistical significance for the factors relating to perceiving their fertility problem as physical and for their perception of control over their stress levels. No significant differences were found between the distressed and less-distressed groups in their interest in attending a stressed management group. When asked how likely it would be for them to attend a stress management program, 73% rated the likelihood of them attending in the lower part of the scale.

## **CHAPTER FOUR**

### **DISCUSSION**

## 4.1 SUMMARY OF RESEARCH

Psychological distress in people who require medical assistance with starting a family has been the focus of many research studies. Few of these investigations have made comparisons with a control group. The present study investigated the effect of infertility on couples and compared the results to a population that were matched on age, gender, relationship status and level of qualification but who had not experienced problems with fertility. To allow comparisons with previous research, common measures of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms were used as an indicator of psychological distress.

Most of the research examining the psychological distress of infertility has focused on the female partner (e.g. Oddens et al, 1999, Sanders and Bruce, 1997). Some studies have looked at the impact of infertility on the male but mostly only when the male has been diagnosed as infertile (Hendrick et al, 2000, Clarke et al 1999). In instances where studies have examined the psychological distress in both partners they have failed to consider which of the partners was receiving treatment. This study aimed to rectify this oversight.

Elevated levels of psychological distress may have a negative impact on a couple's chance of conception although when these couples are offered psychological interventions such as a stress management programs the uptake rate is very low. The present study aimed to establish whether there were any clear reasons that people offer for not attending such a program, and whether or not the experience of elevated levels of distress had an influence on their reasons for non-attendance.



## **4.2 GENERAL FINDINGS**

The present study is comparable with previous research examining the levels of psychological distress in people with infertility in relation to participant numbers, gender and age. However, there was one clear outlier in both the ACU Waiting List group and the matched Control group of men of 56 and 57 years of age. The response rate for participants overall (35%) was what would be anticipated for a questionnaire-based design, regardless of whether they were awaiting treatment or about to start a treatment program.

### **4.3 HYPOTHESES FROM PART ONE OF THE STUDY**

#### **4.3.1 Hypothesis 1**

It was suggested that individuals awaiting fertility treatment would experience more psychological distress than a matched Control group from the general population. The results suggest that individuals awaiting assisted conception experience significantly higher levels of depression, perceived stress and psychological intrusions and avoidance symptoms than the Control group. The results for the group anxiety scores were however not significantly different.

While the ACU Waiting List group experience more elevated levels of depression, perceived stress and psychological intrusions and avoidance symptoms than the Control group, neither group mean exceeded the symptomatic cut-off points advised by each of the corresponding manuals.

A Post Hoc power calculation revealed that the number of participants required for any differences in the levels of anxiety between the two groups was many times greater than the sample size was likely to approach. Based on the number of people who are treated at the Dundee ACU and assuming a response rate of about thirty percent it was estimated that it may take up to about 24 months to collect the number of responses required to reach statistical significance. In light of this, it would probably not be worth repeating the study.

It is possible that the BAI was insufficiently sensitive to detect any differences between the group anxiety scores. A study by Harlow et al (1996) used the State-

Trait Anxiety Inventory (Spielberger et al 1970) to establish anxiety levels in women that were undergoing IVF and a Control group of women who were undergoing laparoscopic surgery unrelated to infertility. While Trait anxiety was constant between the two groups, Harlow et al (1996) discovered a marked increase in the State anxiety scores for women undergoing IVF but not for the women in the Control group. Brighenti et al (1997) examined anxiety in infertile women receiving treatment at an assisted conception unit using the State-Trait Anxiety Inventory and examined a control group comprising of mothers attending a routine gynaecological examination. It was reported that the levels of State anxiety in the infertile mothers increased in response to treatment stress. The present study did not replicate the finding of increased anxiety in couples awaiting treatment. It is possible that a difference in State anxiety may have been detected between the groups in the present study had this measure of anxiety been used. The BAI is a more recent measure and is relatively easy to complete but any future studies may consider the use of the State-Trait Anxiety Inventory.

Other studies that have used a control group include a study by Wischmann et al (2001). Their study examined depression and anxiety in a reference group and an infertile group. They found infertile women showed higher scores on the depression and anxiety scales than the reference group. Unfortunately this particular report fails to detail the inclusion criteria for the reference group and it is therefore difficult to know whether the results of the present study can be systematically compared with Wischmann et al's (2001) study. Overall the results of the present study substantiate results from previous studies showing that infertile couples experience elevated levels of psychological distress.

### 4.3.2 Hypothesis 2

Further to Hypothesis 1 it was predicted that there would be a higher incidence of caseness in the ACU Waiting List group than in the Control group. This was expected in addition to a higher level of symptoms. An analysis revealed a significantly higher level of caseness for depression, perceived stress and psychological intrusions and avoidance symptoms in the ACU Waiting List group than in the Control group. In addition, the results indicate that there are significantly more individuals in the ACU Waiting List group (34) that reach caseness on two or more of the measures than in the Control group (10). The investigation of caseness for two or more measures was based on Boivin et al's (1999) suggestion that these may be the individuals that would be most likely to benefit from some psychological intervention aimed at reducing their distress. Thus, in the population sample awaiting treatment in this study, results suggest that over half of the sample may benefit from psychological intervention.

The analysis failed to detect a significant difference in the frequency of caseness between the two groups on the measure of anxiety although there was a trend in the anticipated direction. It was calculated that the number of participants that would be required for this to reach significance would take over five years to collect in a single centred study or up to one year in a multi-centred study. If the anticipated effect size is very small it is unlikely to be of much clinical significance and on balance there would be little benefit in repeating the study. Similarly, a small effect size was established for the detection of a difference between groups on the number of people that reached caseness on all of the measures.

The high prevalence of depression in infertile women has been emphasised by Domar et al (1992), while Connolly et al (1992) have suggested there to be a link between infertility and psychiatric morbidity. The present analysis indicates that individuals experiencing infertility are more likely than the Control group to reach caseness on a number of psychological measures.

Post hoc investigations revealed that only 27 percent of individuals in the ACU Waiting List group did not reach caseness on any of the measures but that 58 percent of the Control group did not reach caseness on any of the measures. A Post Hoc Chi-square analysis revealed that this difference in total non-caseness between the two groups reaches statistical significance.

### **4.3.3 Hypothesis 3**

It was predicted that women in the ACU Waiting List group would experience more psychological distress than men in this group regardless of who received treatment. The results indicate, as hypothesised, that women experience more anxiety, depression and psychological intrusions and avoidance symptoms than men. In the absence of any main effect of who was the index person it is appropriate to conclude that, as hypothesised, women experience more anxiety, depression and psychological intrusions and avoidance symptoms than men regardless of who receives direct medical treatment.

The results for perceived stress did not reach statistical significance in this population. However, it was calculated that the recruitment of sufficient participants to reach statistical significance should take no longer than three months in a single centred study. This suggests that it may be worth replicating the study and recruiting sufficient subjects to avoid the occurrence of a Type II error.

There are many reports that suggest that women are more affected by infertility than men (e.g. Wright et al, 1991; Sabourin et al, 1991). Guerra et al (1998) examined the psychiatric morbidity of infertile patients and concluded that women experience more distress and more psychiatric morbidity than men. Guerra et al's study however did not control for which partner was receiving direct medical treatment for infertility, or whether they both were. For the purpose of this study the person who was receiving medical treatment was referred to as the Index person. Fertility treatment is particularly invasive for the female partner and usually involved at least one operation. There is also the necessity for the woman to take drugs that may have powerful

negative side effects. This hypothesis examined gender differences in distress levels whilst controlling for which partner received treatment. This was achieved in the design of the study by asking the couples to indicate which of them received treatment or whether they both did.

Guerra et al (1998) suggest that women are more knowledgeable regarding infertility problems and are less reluctant to report their stress. It has also been suggested (Tarlatis et al., 1993) that male partners have a tendency towards repressed anxiety and thus have a greater risk of psychosomatic illness. Any future study could incorporate an investigation of the symptoms of psychosomatic illnesses.

The gender difference in this and other investigations, could be explained by the traditional social role restrictions where men do not habitually report their feelings openly. In addition it is possible that men use different strategies to cope with infertility. A meta-analysis (Jordan and Revenson, 1999) revealed that in over half of the studies on coping strategies reviewed it was found that women use the strategies of Seeking Social Support, Planful Problem Solving and Positive Reappraisal to a greater degree than their male partners. Kowalcek et al (2001) conclude that infertile men activate all coping strategies to a smaller extent than the reference sample. It has also been identified (Newton and Houle, 1996) that men are more likely to engage in denial. Discussing their concerns is not a strategy frequently used by men and could explain this well established gender difference.

It should be noted that manuals for the Beck Anxiety Inventory (Beck and Steer, 1993) and the Beck Depression Inventory - II (Beck et al, 1996) outline that there may be a relationship between the BAI and the BDI-II and gender. The validation

study for each of the questionnaires revealed that the mean score for women was 3.6 points higher on the BAI (Beck and Steer, 1993) and 3.2 points higher than the men's BDI-II score (Beck et al, 1996). There are no reported sex differences for the Perceived Stress Scale or the Impact of Events Scale. It is likely that these gender differences, on the measurements of anxiety and depression, may have influenced the results in the present study. Unfortunately, the manuals do not recommend a way of compensating for these sex differences and it appears that separate normative values would be the most appropriate solution. However, Beck et al (1993, 1996) suggest that while the researcher would be wise to be aware of these differences when examining research data there are no need for separate normative values for males and females.

#### **4.3.4 Hypothesis 4**

It was hypothesised that older women would experience more psychological distress than younger women. It was anticipated that as the female's age increases her perception of risk of non-success in fertility treatment would increase and precipitate more elevated levels of distress. It is also clear that the age criteria for assisted conception for most units is set at younger than 42. In view of the decline in female fertility over 35 years of age, the psychological distresses in women over and below this age were compared.

The results failed to support this hypothesis within this sample. The current study did not identify any differences in psychological distress between older and younger women in the anticipated direction. Post Hoc analyses revealed that there was actually a significant result for perceived stress in the opposite direction to the original



hypothesis. Although this result was not anticipated, there are several factors external to the process of assisted conception that may have contributed to this finding. It is possible that younger women have friends of similar ages conceiving easily and starting their own families. This may have a negative impact as they are frequently exposed to their fertility problem and may experience continual querying from their friends about when they are going to start their own families. This may be exacerbated by the common belief that individuals are in control of their fertility with the use of contraception and that ceasing to use contraception will automatically lead to becoming pregnant. It is possible that older women are more habituated to the idea of their infertility and as a result experience less stress. In addition it is likely that women over 35 years of age have a more settled life style in that they may be more established in their careers and home life than women of a younger age. As yet, there is relatively little in the literature to explain the finding that younger women tend to be more psychologically distressed than older women and the explanation of this finding remains highly speculative.

Guerra et al (1998) found that psychiatric morbidity in infertile females was positively associated with the woman's age. However the results of the present study did not replicate this finding.

### 4.3.5 Hypothesis 5

It was expected that women who had experienced more than one treatment cycle would report higher levels of anxiety, depression, perceived stress and psychological intrusions and avoidance symptoms than women who had experienced one or no treatment cycles regardless of whether they were young or old.

There was a significant effect of the number of treatment cycles experienced on levels of depression. This suggests that women who have undergone more than one treatment cycle experience significantly more elevated levels of depression than women who have undergone only one or none.

The results did not reach significance for measures of anxiety, perceived stress or avoidance and intrusion symptoms although there were strong trends in the hypothesised direction. A power calculation revealed that the magnitude of individuals that would be required in each group for these trends to reach significance was many times greater than the present study sample was likely to approach. Further calculations revealed that this magnitude of individuals may take over three years to recruit at a single centred study. This suggests that it would probably not be beneficial to replicate this study in a single centre but may be worthy of consideration in a multi-centre study. Women who have experienced two or more treatment cycles are significantly more depressed than women who have only received one or no treatment cycles. This finding is in line with previous research (Guerra et al, 1998) that has investigated levels of depression in infertile women.

## **4.4 HYPOTHESES FROM PART II OF THE STUDY**

Participants for the ACU Treatment group were recruited at the same time as they received an invitation from the Dundee Assisted Conception Unit to begin a new treatment cycle. The data from the ACU Treatment group was then compared in the following analyses with the from the ACU Waiting List group.

### **4.4.1 Hypothesis 6**

It was hypothesised that there would be more elevated levels of distress in the ACU Treatment group than in the ACU Waiting List group. The results indicate that there were no significant differences between the two groups on any of the measures. This suggests that being offered treatment is no more psychologically distressing than awaiting treatment.

Given that none of the analyses reached significance it is likely that the treatment procedures are not perceived to be the most threatening part of the process. If the treatment procedures were the most stress-provoking aspect of assisted conception there should have been a significant difference between the two groups in the hypothesised direction on their levels of distress. It is likely that the stress of beginning a new treatment cycle balances other stresses relating to awaiting treatment and provides a sense of hope for the couple. It is also likely that stressors come from elsewhere, either external to the individual or from their own ability to adjust sufficiently to their experiences or cope sufficiently well.

#### **4.4.2 Hypothesis 7**

It was suggested that women will experience more psychological distress than men regardless of whether they are awaiting treatment or whether they are starting a treatment cycle.

The results suggest that there was a significant difference in levels of anxiety, depression and psychological intrusions and avoidance symptoms between men and women regardless of whether they were awaiting treatment or are about to commence a new treatment cycle. There was a surprising result for the perceived stress scores, which indicated a significant interaction between the two factors. The profile of these factors (see Appendix 6) suggests that women perceive themselves to be more stressed than men whilst they are awaiting treatment but that men become more stressed than women when they (as a couple) are about to undergo treatment. This result may be explained by examining the literature on men's coping skills. Research has shown that men use different coping strategies to women (Jordan and Revenson, 1999) and that men undergoing infertility use coping strategies less frequently than controls (Kowalcek et al, 2001). It is possible that using fewer coping strategies is not hugely problematic whilst awaiting treatment as men can rely on the strategy of denial (Newton and Houle, 1996) to avoid any distress. However, when the couple are invited for treatment and attend frequent appointments at the fertility clinic they will both experience constant reminders relating to the reality of their fertility problem. It would be useful at this point for men to employ more appropriate coping strategies (as the strategy of denial will no longer be a plausible option) but they are ill equipped to do so and as a consequence experience an increase in the levels of perceived stress.

It is also essential to consider that these are cross-sectional comparisons, and it would be incorrect to assume that everyone started with equivalent levels of psychological functioning. It is possible that the women in the treatment group are less prone towards stress than the women in the waiting list group. A longitudinal, repeated measures study would be required to determine with more confidence the likely cause of the differences.

#### **4.4.3 Hypothesis 8**

It was expected that psychologically distressed individuals that had been offered a new treatment cycle would give different reasons for non-attendance at a stress management program to less-distressed individuals.

The results indicated that overall the distressed group reported more reasons for non-attendance than the less-distressed group.

On examination of the different factors it was found that the distressed group gave more reasons for non-attendance on each of the five factors than the less-distressed group. This difference reached statistical significance for two factors. The first factor was viewing their fertility problem as medical and the second factor measured issues relating to control over stress. These results indicate that distressed individuals perceive their problem as medical and they assume that it would not be worthwhile attending any psychological intervention for what they believe essentially to be a physical problem. In addition, the distressed individuals gave more major reasons for non-attendance relating to their perceptions of stress. This indicates that they may have difficulty recognising stress and the causes of stress or the opportunities to

control their stress. If they perceive their control over stress to be minimal they will see little benefit in attending a stress management program. These results suggest that this group of individuals feel helpless, because they view their fertility problem as solely medical and hopeless because even if they understand the negative affects of stress on fertility they do not believe that they can control their own stress levels. The results of the present study are not comparable with a similar study by Boivin et al (1999) who examined reasons for non-attendance in counselling. They concluded that stressed individuals gave reasons relating to knowing who to contact and financial expenses as reasons preventing them from using a counsellor. The present study was designed specifically to exclude these factors and attempt to establish more informative results.

#### **4.4.4 Hypothesis 9**

It was hypothesised that distressed individuals would be more likely to want to attend a stress management program than less-distressed individuals. This hypothesis was predicted on the basis of Boivin et al's (1999) assertion that there may be a subgroup of individuals that have more elevated levels of distress and are more likely to attend psychosocial interventions.

The results indicate that there was no significant difference between the distressed and less-distressed groups on their decision of whether they would like to attend such an intervention. The number of people that indicated that they may be interested in attending a stress management group was low for both the distressed and the less-distressed group. Statistical analyses confirmed that there was a statistically significant

difference between the number of people who thought that they may wish to attend such a group and those who would not.

Unfortunately, due to the data from each of the individuals being anonymous it would not be possible to contact these individuals to formally invite them to such a program. In any future research similar to this the participants could be given the opportunity to have control over revealing their identity and contact number should they wish to participate in such an intervention and the actual attendance rates thereafter could be monitored. This may however be considered by the ethics committee to be an unacceptable proposal. Boivin et al (1999) investigated reasons for non-attendance at psychosocial counselling for infertility and effectively overcame the aforementioned ethical problems in establishing actual attendance rates. They asked participants to indicate whether they had previously had contact with any psychological support service offering any form of psychological intervention. They found that the percentage of patients who had actually used formal sources of support such as a psychologist, counsellor or support groups, at some stage in the past, was less than 11 percent for both men and women. It is possible that the number of people who have used formal sources of support is likely to be higher in a study such as this and the real proportion may be much smaller and often quite unrepresentative.

Overall this analysis suggests that the majority of infertile individuals do not wish to attend a stress management program and confirmed previous findings on the low uptake rate of psychological interventions.

#### **4.4.5 Summary of Results**

The ACU Waiting List group was significantly more depressed, perceived themselves to be more stressed and experienced more psychological intrusions and avoidance symptoms than participants in the matched Control group. There was no difference in the level of anxiety between the two groups. The group means of the ACU Waiting List group and the Control group differed significantly on the three assessment measures but neither of the two group means reached the symptomatic cut off points for any of these measures. There were significantly more individuals in the ACU Waiting List group that reached clinical caseness than in the Control group. In line with previous research findings the results revealed that women experience more distress than men. This widespread finding was extended by results that indicated that this gender difference remains significant even when the man receives direct treatment.

There were no significant effects of the age of the woman. Women that have experienced two or more treatment cycles are more depressed than women who have experience only one or none regardless of their age. There were no significant differences in levels of psychological distress between couples awaiting treatment and those who had just been invited to attend a new treatment cycle and women remained more distressed than men throughout this process.

Distressed individuals gave more reasons overall for non-attendance at a stress management program than those were less-distressed. This difference reached statistical significance for the two factors relating to perception of their fertility problem as predominantly medical and lack of control regarding their stress levels.



However, decisions on whether to attend a stress management program did not alter as a function of current levels of distress. Significantly more individuals indicated that they would not attend such a group if it was actually offered to them than those who reported that they might attend. This is in accordance with the initial interest to the previously offered stress management group, when only one couple showed an interest.

## **4.5 GENERAL METHODOLOGICAL ISSUES**

Identifying information was not requested (for ethical reasons) from the couples and as a consequence nothing is known about the individuals who chose not to participate. While this method of data collection is relatively convenient it may not necessarily yield a sample from which study results can be generalised to other samples. However, the demographic information collected with the returned questionnaires showed that the sample was similar in age and level of qualification to the patient population, as well as to that of patients participating in other studies, (Boivin and Takefman, 1996). Some of the results in the present study were also consistent with well-established findings, for example, low uptake of psychological intervention, higher distress in women compared with men and a high percentage of symptomatic caseness on various psychological measurements in this population. These results may be used to argue that this sample was representative of infertility patients in general. Similar interest in stress management programs on two occasions may indicate that the reasons for non-attendance are likely to be similar across this population group.

It may have been possible to recruit more than one couple into the stress management group had a different recruitment method been used. It has been demonstrated that more patients can be enlisted at support groups if they are contacted personally and if the merits of this are presented on a one-to-one basis rather than through notices or letters (Goodman and Rothman, 1984). This was however impossible for the present study as strict regulations on confidentiality and anonymity were upheld by the ACU and the Ethics Committee.

The questionnaire examining reasons for non-attendance at a stress management program was intended only as a pilot study. A larger sample size would be required to analyse the data in a more appropriate manner and conduct a factor analysis.

Three limitations of this study are noteworthy. Firstly, the present study failed to investigate whether any of the couples had children. Few previous studies have investigated this factor which may have numerous influences on the stress process of infertile individuals. Secondly, the present study did not control for which couples were receiving NHS funded treatment and which couples were responsible for their own funding. This would have been an interesting distinction to investigate further and could have influenced results such as women's distress levels relating to the number of cycles experienced. For example, if a couple rely solely on NHS funded treatment they will know that they can only receive funding for three treatment cycles. Many of the previous studies on infertility have been conducted in the United States of America where only private health care is available. More studies are required in the United Kingdom specifically on the effects of being financially supported but also limited by NHS funding. Finally, Hypotheses 8 and 9 examined whether there was any influence of an individual's current level of psychological distress on their reasons for non-attendance at a stress management program. Boivin et al (1999) investigated a similar concept but asked individuals to rate how distressed they were feeling. This would have been a useful inclusion in the present study to enable a comparison of an individual's measured level of distress and how they see themselves.

## **4.6 CLINICAL RECOMMENDATIONS**

Several recommendations for clinical practise can be proposed on the basis of the results from this study. The most frequent recommendation in other studies and among regulatory bodies is that supportive and therapeutic psychological interventions should be made available. However the up-take rate of infertile couples and individuals for psychological services is very low. There is a great need to identify alternative methods of providing psychological support for this group of individuals. The Health Belief Model (Rosenstock, 1966) proposed that the likelihood of using health services such as a stress management group is a function of the individual's perceived severity of their distress, and the extent to which such services are thought to be beneficial. Many of the stressed individuals appeared to believe that their fertility problems were solely medical and that psychological intervention would be of little or no benefit. Similarly, many of the stressed individuals appear to believe that a stress management program would have little value in helping with stresses that were out-with their control anyway. The results of the present study suggest that health education appears to be the most sensible solution to this problem. This might most effectively be achieved by use of an informative document illustrating the evidence regarding the detrimental affect of stress on fertility and psycho-education regarding control over stress.

Boivin et al (1999) recommended a two-tier service in which individuals should be offered information in some non-verbal format and more distressed individuals should be offered individual, couple or group therapy.

A psychosocial document may be sufficient for many couples for informing and helping them to cope with the stresses that are involved with infertility. However there may be a number of individuals for whom such a document may not be adequate. It may be important for staff at infertility clinics to receive basic training on the detection of more severe psychological problems or to enlist the use of a screening tool primarily because of the high level of caseness that has been detected in the present and other studies. Once identified these individuals should be offered psychological interventions and informed personally of the potential benefits of such an intervention to increase the rate of attendance.

## 4.7 DIRECTIONS FOR FUTURE RESEARCH

The present study examined the effect of being offered a new treatment cycle on levels of distress. There were no significant differences between those who had been offered treatment and those who were still awaiting treatment. Future research may benefit from expanding on this aspect of the present study and focussing on further sub-groups of infertile women; those that have received embryo transfer and are awaiting a pregnancy test. Yong et al (2000) carried out such an analysis and discovered that women show marked increases in levels of depression and State anxiety, while awaiting the results of their pregnancy test. Ideally any future study should employ a within subjects design and women's psychological functioning should be assessed at 4 stages of the infertility treatment process: 1. Awaiting treatment. 2. Being offered treatment and attending for consultation. 3. Awaiting their pregnancy test. 4. After treatment. This design may give a true insight into the psychological journey of the couple's experience of assisted conception.

The present study would suggest that distress amongst the infertility population is high. These individuals do not pursue psychosocial interventions aimed at helping them to understand and alleviate their distress. Therefore, any future research could endeavour to develop and evaluate the effects of a psychosocial document, such as an informative leaflet, as an intermediary form of treatment for the infertile couple and to help socialise them into therapy.

## **4.8 CONCLUSIONS**

The results of this study have shown that infertile couples are more distressed than the normal population and that they reach clinical caseness on a number of psychological measures more frequently. The common finding that infertile women are more distressed than men was replicated in this study. In addition to this the results suggest that this finding is maintained regardless of whether or not the male receives direct treatment and regardless of at what stage the couple are in the treatment cycle.

Infertile couples experience significant levels of distress although the results of this study demonstrate that they are reluctant to participate in psychological interventions aimed at helping them understand and cope with their distress. Distressed individuals give more reasons overall for not attending such interventions and specifically have the view that their fertility problems are solely medical and that they have no control over their stress levels.

Any further investigations in this area should concentrate on alternative ways of educating these individuals specifically on the negative consequences of stress on their fertility and outline various strategies to increase their ability to control their stress levels. Only after this has been achieved may these individuals be in a position to recognise the benefits of psychosocial therapy and attend interventions such as a stress management program.

## **CHAPTER 5**

### **REFERENCES**



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## APPENDICES

## **6.1 APPENDIX ONE**

### **Part One – ACU Waiting List Group**

Patient information sheet

Patient consent forms

Questionnaires



## The Psychosocial impact of Infertility. Information Sheet.

We invite you to participate in a research project. We believe it to be of potential importance. However, before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it, and secondly what it would involve if you agreed. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you have, and, if you want, discuss it with outsiders. We will do our best to explain and to provide any further information you may ask for now or later. You do not have to make an immediate decision.

### *Who is involved with this research?*

Dr Tony Harrold, Consultant Gynaecologist and Anne McConnell, who may be contacted at the assisted conception unit, Ninewells, are involved and Nicky Smart, who works in the clinical psychology department in Ninewells hospital and may be contacted on 01382 425612 should you have any queries or doubts at any stage.

### *What is this research project all about?*

We are investigating the psychological effects of experiencing difficulties with fertility.

### *What will I have to do?*

If you agree to participate in this study you will be asked to complete the enclosed questionnaires that are designed to measure different psychological aspects of you and your situation. You can fill these in at home and send them to Anne McConnell, anonymously, in the pre-paid envelope provided. We are interested in collecting data from both partners and so have enclosed two questionnaires, **one for each of you to complete**. Your questionnaires are completely anonymous and Anne will pass them onto Nicky Smart for analysis only after she has checked and separated off your consent form.

### *What is the purpose of this research?*

We are hoping that the results of this study will give us an insight into the psychological stresses of entering into an assisted conception treatment program. We hope to use the information to create a more informed therapy/counselling service.

### *What if I want any further information before making a decision?*

Please contact Anne McConnell at the ACU, or Miss Nicky Smart on 01382 425612, for any further information.

### *How long do I have to make a decision?*

Please take up to **one week** to decide if you wish to participate in this study and if you do, please complete the enclosed questionnaires and consent form and return them in the pre-paid envelope.

**Thank you for taking the time to read this information sheet.**

**The Psychosocial impact of Infertility.  
Consent Form.**

**(The patient should complete this form himself/herself)**

**PLEASE CROSS OUT  
AS NECESSARY**

**Have you read the Patient Information Sheet? YES/NO**

**Have you had an opportunity to ask questions  
and discuss this study? YES/NO**

**Have you received satisfactory answers to all of  
your questions? YES/NO**

**Have you received enough information about the  
study? YES/NO**

**Who have you spoken to? Dr./Mr./Mrs/Miss. ....**

**Do you understand that participation is entirely  
voluntary? YES/NO**

**Do you understand that you are free to withdraw from the study:**

- \* at any time?**
- \* without having to give a reason for withdrawing?**
- \* without this affecting your future medical care? YES/NO**

**Do you agree to take part in this study? YES/NO**

**Patient's Signature ..... Date.....**

**Patient's name in block letters  
.....**

**Telephone number where patient can be contacted:**

**..... (Home) ..... (Work)**

**Stress Management for ACU patients.  
A Survey.**

1. Are you Male or Female?.....
  
2. How old are you?.....
  
3. What is your occupation?.....
  
4. What is your highest level of qualification? (Please circle one).
 

i. None	iv. Degree/Diploma
ii. Standard grades/G.C.S.E.s/C.S.E.'s/ O levels	v. Post Graduate Degree
iii. Highers/A Levels	
  
5. Is it you or your partner or both of you who receive direct treatment from the assisted conception unit? (Please circle one)
 

Me.    My partner.    Both of us.
  
6. At what stage in the treatment cycle are you? (Please circle one).
 

Awaiting.    Undergoing.    Stopped treatment
  
7. How many treatment cycles have you had?.....
  
8. If you have had previous treatment cycles how long was it since your last?.....
  
9. What has been the most stressful event in relation to the assisted conception treatment that you have experienced to date?.....  
.....

# Impact of Event Scale (IES)

On (date): \_\_\_\_\_

You experienced (life event): \_\_\_\_\_

Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you **during the past seven days**. If they did not occur during that time, please mark the "not at all" column.

	Frequency			
	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to				
2. I avoided letting myself get upset when I thought about it or was reminded of it				
3. I tried to remove it from memory				
4. I had trouble falling asleep or staying asleep, because of the pictures or thoughts about it that came into my mind				
5. I had waves of strong feelings about it				
6. I had dreams about it				
7. I stayed away from reminders of it				
8. I felt as if it hadn't happened or it wasn't real				
9. I tried not to talk about it				
10. Pictures about it popped into my mind				
11. Other things kept making me think about it				
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them				
13. I tried not to think about it				
14. Any reminder brought back feelings about it				
15. My feelings about it were kind of numb				

This measure is part of *Measures in Post Traumatic Stress Disorder: A Practitioner's Guide* by Stuart Turner and Deborah Lee. Once the invoice has been paid, it may be photocopied for use *within the purchasing institution* only. Published by The NFER-NELSON Publishing Company Ltd, Darville House, 2 Oxford Road East, Windsor, Berkshire SL4 1DF, UK. Code 4930004



11. Please indicate by placing an X in the corresponding box how frequently in the last month you have experienced each of the following items:

	Never	Almost Never	Some times	Fairly often	Often
Been upset because of something that happened unexpectedly?					
Felt that you were unable to control important things in your life?					
Felt nervous and stressed?					
Dealt with irritating life hassles?					
Felt that you were coping with important changes that were occurring?					
Felt confident about your ability to handle your personal problems?					
Felt that things were going your way?					
Found that you couldn't cope with all the things you had to do?					
Been able to control irritations in your life?					
Felt that you were on top of things?					
Been angered because of things that happened that were outside your control?					
Found yourself thinking about things you have to accomplish?*					
Been able to control the way you spend your time?					
Felt difficulties were piling up so high that you couldn't overcome them					

12. Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the past week, including today, by placing an X in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant but I could stand it	SEVERELY I could barely stand it.
Numbness or tingling.				
Feeling hot.				
Wobbliness in legs.				
Unable to relax.				
Fear of the worst happening.				
Dizzy or lightheaded.				
Heart pounding or racing.				
Unsteady.				
Terrified.				
Nervous.				
Feelings of choking.				
Hands trembling.				
Shaky.				
Fear of losing control.				
Difficulty breathing.				
Fear of dying.				
Scared.				
Indigestion or discomfort in abdomen.				
Faint.				
Face flushed.				
Sweating (not due to heat).				

**Stress Management for ACU patients.  
A Survey.**

**13.** This part of the questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including item 16 (Changes in sleep Pattern) or Item 18 (Changes in Appetite).

**1. Sadness**

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

**2. Pessimism**

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

**3. Past Failure**

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

**4. Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

**5. Guilty Feelings**

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

**6. Punishment Feelings**

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

**7. Self-Dislike**

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

**8. Self-Criticalness**

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

**9. Suicidal Thoughts or Wishes**

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

**10. Crying**

- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Please continue on the back.

**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.

---

- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.

---

- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.

---

- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.

---

- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.

---

- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.

---

- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

**Thank you for taking the time to complete this questionnaire.**

Please return to Nicky Smart at Ninewells, in the envelope provided.

## **6.2 APPENDIX TWO**

### **Part One – Control Group**

Patient information sheet

Questionnaires



**Stress Management for ACU patients.  
A Survey.**

**Information Sheet.**

We invite you to participate in a research project. We believe it to be of potential importance. However, before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it, and secondly what it would involve if you agreed. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you have, and, if you want, discuss it with outsiders. We will do our best to explain and to provide any further information you may ask for now or later. You do not have to make an immediate decision.

***Who is involved with this research?***

Dr Tony Harrold, Consultant Gynaecologist and Anne McConnell, who work at Ninewells, and Nicky Smart, who works in the Clinical Psychology Department and may be contacted on 01382 425612 should you have any queries at any stage.

***What is this research project all about?***

We are investigating the psychosocial affects of infertility. This is being done by collecting data from individuals that are currently receiving treatment for their infertility. However, we need a control group against which to contract this data. Therefore we are interested in getting information from people who have not received any medical treatment for infertility.

***What will I have to do?***

If you agree to participate in this study you will complete the enclosed questionnaire and return it to Nicky Smart in the envelope provided. You can fill these in at home and send them to Nicky Smart, **anonymously**, in the pre-paid envelope provided. Your questionnaires are completely anonymous.

***What if I want any further information before making a decision?***

Please contact Miss Nicky Smart on 01382 425612, for any further information.

***How long do I have to make a decision?***

Please take up to one week to decide if you wish to participate in this study. If you do wish to participate please complete the attached sheet and return it to Nicky Smart, Clinical Psychology, Level 6, South, Block, Ninewells Hospital, Dundee, DD1 9SY. If you do not wish to complete the questionnaire please tick the box indicating that you do not wish to participate and return it to Nicky Smart.

**Thank you for taking the time to read this information sheet.**

**Levels of distress in the general population.  
A Survey.**

1. Are you Male or Female?.....

2. How old are you?.....

3. What is your occupation?.....

4. What is your highest level of qualification? (Please circle one).

i. None

iv. Degree/Diploma

ii. Standard grades/G.C.S.E.s/C.S.E.'s/ O levels

v. Post Graduate Degree

iii. Highers/A Levels

5. Are you currently in a relationship?(Please circle one)

Yes

No

6. Have you ever experienced any medical investigations into your fertility?  
(Please circle one).

Yes

No

7. How many treatment cycles have you had?.....

8. What has been the most stressful event that you have experienced in your life to date?.....  
.....

# Impact of Event Scale (IES)

On (date): \_\_\_\_\_

You experienced (life event): \_\_\_\_\_

Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you **during the past seven days**. If they did not occur during that time, please mark the "not at all" column.

	Frequency			
	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to				
2. I avoided letting myself get upset when I thought about it or was reminded of it				
3. I tried to remove it from memory				
4. I had trouble falling asleep or staying asleep, because of the pictures or thoughts about it that came into my mind				
5. I had waves of strong feelings about it				
6. I had dreams about it				
7. I stayed away from reminders of it				
8. I felt as if it hadn't happened or it wasn't real				
9. I tried not to talk about it				
10. Pictures about it popped into my mind				
11. Other things kept making me think about it				
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them				
13. I tried not to think about it				
14. Any reminder brought back feelings about it				
15. My feelings about it were kind of numb				

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11. Please indicate by placing an X in the corresponding box how frequently in the last month you have experienced each of the following items:

	Never	Almost Never	Some times	Fairly often	Often
Been upset because of something that happened unexpectedly?					
Felt that you were unable to control important things in your life?					
Felt nervous and stressed?					
Dealt with irritating life hassles?					
Felt that you were coping with important changes that were occurring?					
Felt confident about your ability to handle your personal problems?					
Felt that things were going your way?					
Found that you couldn't cope with all the things you had to do?					
Been able to control irritations in your life?					
Felt that you were on top of things?					
Been angered because of things that happened that were outside your control?					
Found yourself thinking about things you have to accomplish?					
Been able to control the way you spend your time?					
Felt difficulties were piling up so high that you couldn't overcome them					

12. Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the past week, including today, by placing an X in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant but I could stand it	SEVERELY I could barely stand it.
Numbness or tingling.				
Feeling hot.				
Wobbliness in legs.				
Unable to relax.				
Fear of the worst happening.				
Dizzy or lightheaded.				
Heart pounding or racing.				
Unsteady.				
Terrified.				
Nervous.				
Feelings of choking.				
Hands trembling.				
Shaky.				
Fear of losing control.				
Difficulty breathing.				
Fear of dying.				
Scared.				
Indigestion or discomfort in abdomen.				
Faint.				
Face flushed.				
Sweating (not due to heat).				

**Stress Management for ACU patients.  
A Survey.**

**13.** This part of the questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including item 16 (Changes in sleep Pattern) or Item 18 (Changes in Appetite).

**1. Sadness**

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

**2. Pessimism**

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

**3. Past Failure**

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

**4. Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

**5. Guilty Feelings**

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

**6. Punishment Feelings**

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

**7. Self-Dislike**

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

**8. Self-Criticalness**

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

**9. Suicidal Thoughts or Wishes**

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

**10. Crying**

- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Please continue on the back.

**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.

---

- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.

---

- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.

---

- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.

---

- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.

---

- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.

---

- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

**Thank you for taking the time to complete this questionnaire.**

Please return to Nicky Smart at Ninewells, in the envelope provided.

## **6.3 APPENDIX THREE**

### **Part Two – ACU Treatment Group**

Patient information sheet

Questionnaires

**Stress Management for ACU patients.  
A Survey.**

We invite you to participate in a research project. We believe it to be of potential importance. Before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it, and secondly what it would involve if you agreed. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you have, and, if you want, discuss it with outsiders. We will do our best to explain and to provide any further information you may ask for now or later. You do not have to make an immediate decision.

***Who is involved with this research?***

Dr Tony Harrold, Consultant Gynaecologist and Anne McConnell, who may be contacted at the assisted conception unit, Ninewells, are involved and Nicky Smart, who works in the Clinical Psychology Department in Ninewells hospital and may be contacted on 01382 425612 should you have any queries or doubts at any stage.

***What is this research project all about?***

In the past Ninewells Assisted Conception Unit has offered a Psychologist-led Stress Management group to people in a similar situation to you. We are now investigating why this service has not been very popular and if there is anything we can do to improve this in the future. We are investigating some of the reasons why people may **not** wish to attend.

***What will I have to do?***

If you agree to participate in this study you will complete the enclosed questionnaire and return it to Nicky Smart in the envelope provided. You can fill these in at home and send them to Nicky Smart, **anonymously**, in the pre-paid envelope provided. We are interested in collecting data from both partners and so have enclosed two questionnaires, **one for each of you to complete**. Your questionnaires are completely anonymous.

***What if I want any further information before making a decision?***

Please contact Anne McConnell at the ACU, or Miss Nicky Smart on 01382 425612, for any further information.

***How long do I have to make a decision?***

Please take up to one week to decide if you wish to participate in this study. If you do wish to participate please complete the attached sheet and return it to Nicky Smart, Clinical Psychology, Level 6, South, Block, Ninewells Hospital, Dundee, DD1 9SY. If you do not wish to complete the questionnaire please tick the box indicating that you do not wish to participate and return it to Nicky Smart.

**Thank you for taking the time to read this information sheet.**



## Stress Management for ACU patients.

### A Survey.

I have read and understood the information sheet. Yes No  
 I understand that I can telephone the researchers and ask questions. Yes No  
 I give consent to participate in this study and agree to complete this form. Yes No\*

*\*If you do not wish to complete this questionnaire please still return to Nicky Smart in the envelope provided.*

Below are a few reasons why people may not wish to attend a stress management group. Please read through the items and tick to what degree each item may be a reason **for you** not to pursue the option of attending a stress management program.

Reason	Major	Minor	Not
1 I don't think I would fit in with other members of the group.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 I have problems with transport to and from the Hospital.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 I don't think I would feel comfortable in a group of people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 I don't think I am stressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 I wouldn't want to speak about feeling stressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 I would feel worse if I spoke about feeling stressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 I don't think the group would be tailored to my needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 I've had enough of hospital appointments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 I don't think I would be listened to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 I don't think I would be understood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 I don't need to see a clinical psychologist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 I think only crazy people see clinical psychologists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Everyone in the group will know about my fertility problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 I can get the information I need about stress from a book.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 My friends/partner help me with my difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 I can't be bothered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 I've got no control over my stress so there's no point.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 I am too busy and can't afford the time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 I can't attend because of practical problems like work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 I just can't face another professional.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Fertility is a personal issue that I don't want to discuss.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 I'm worried about what people think about me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 My problem is medical.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 I can't afford to attend.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 I need more information about what's involved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 It's too embarrassing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 My partner would like to attend, but I'd talk him/her out of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28 I would like to attend but my partner talked me out of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there is one clear reason that stands out above the rest for you please indicate which one it is by entering the number here...

If there are any other reasons why you would chose not to participate in a stress management group could you please outline them in the space below:

.....

.....

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.....

At some point in the future the ACU may offer stress management groups, please indicate how likely you would be to sign up to such a group on the scale below: -

**Not at all**

**Definitely**



**Stress Management for ACU patients.  
A Survey.**

1. Are you Male or Female?.....

2. How old are you?.....

3. What is your occupation?.....

4. What is your highest level of qualification? (Please circle one).

i. None

iv. Degree/Diploma

ii. Standard grades/G.C.S.E.s/C.S.E.2s/ O levels

v. Post Graduate Degree

iii. Highers/A Levels

5. Is it you or your partner or both of you who receive direct treatment from the assisted conception unit? (Please circle one)

Me. My partner. Both of us.

6. At what stage in the treatment cycle are you? (Please circle one).

Awaiting. Undergoing. Stopped treatment

7. How many treatment cycles have you had?.....

8. If you have had previous treatment cycles how long was it since your last?.....

9. What has been the most stressful event in relation to the assisted conception treatment that you have experienced to date?.....

.....

# Impact of Event Scale (IES)

On (date): \_\_\_\_\_

You experienced (life event): \_\_\_\_\_

Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you **during the past seven days**. If they did not occur during that time, please mark the "not at all" column.

	Frequency			
	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to				
2. I avoided letting myself get upset when I thought about it or was reminded of it				
3. I tried to remove it from memory				
4. I had trouble falling asleep or staying asleep, because of the pictures or thoughts about it that came into my mind				
5. I had waves of strong feelings about it				
6. I had dreams about it				
7. I stayed away from reminders of it				
8. I felt as if it hadn't happened or it wasn't real				
9. I tried not to talk about it				
10. Pictures about it popped into my mind				
11. Other things kept making me think about it				
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them				
13. I tried not to think about it				
14. Any reminder brought back feelings about it				
15. My feelings about it were kind of numb				

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11. Please indicate by placing an X in the corresponding box how frequently in the last month you have experienced each of the following items:

	Never	Almost Never	Some times	Fairly often	Often
Been upset because of something that happened unexpectedly?					
Felt that you were unable to control important things in your life?					
Felt nervous and stressed?					
Dealt with irritating life hassles?					
Felt that you were coping with important changes that were occurring?					
Felt confident about your ability to handle your personal problems?					
Felt that things were going your way?					
Found that you couldn't cope with all the things you had to do?					
Been able to control irritations in your life?					
Felt that you were on top of things?					
Been angered because of things that happened that were outside your control?					
Found yourself thinking about things you have to accomplish?					
Been able to control the way you spend your time?					
Felt difficulties were piling up so high that you couldn't overcome them					

12. Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the past week, including today, by placing an X in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant but I could stand it	SEVERELY I could barely stand it.
Numbness or tingling.				
Feeling hot.				
Wobbliness in legs.				
Unable to relax.				
Fear of the worst happening.				
Dizzy or lightheaded.				
Heart pounding or racing.				
Unsteady.				
Terrified.				
Nervous.				
Feelings of choking.				
Hands trembling.				
Shaky.				
Fear of losing control.				
Difficulty breathing.				
Fear of dying.				
Scared.				
Indigestion or discomfort in abdomen.				
Faint.				
Face flushed.				
Sweating (not due to heat).				

**Stress Management for ACU patients.  
A Survey.**

**13.** This part of the questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including item 16 (Changes in sleep Pattern) or Item 18 (Changes in Appetite).

<p><b>1. Sadness</b></p> <p>0 I do not feel sad.</p> <p>1 I feel sad much of the time.</p> <p>2 I am sad all the time.</p> <p>3 I am so sad or unhappy that I can't stand it.</p> <p><b>2. Pessimism</b></p> <p>0 I am not discouraged about my future.</p> <p>1 I feel more discouraged about my future than I used to be.</p> <p>2 I do not expect things to work out for me.</p> <p>3 I feel my future is hopeless and will only get worse.</p> <p><b>3. Past Failure</b></p> <p>0 I do not feel like a failure.</p> <p>1 I have failed more than I should have.</p> <p>2 As I look back, I see a lot of failures.</p> <p>3 I feel I am a total failure as a person.</p> <p><b>4. Loss of Pleasure</b></p> <p>0 I get as much pleasure as I ever did from the things I enjoy.</p> <p>1 I don't enjoy things as much as I used to.</p> <p>2 I get very little pleasure from the things I used to enjoy.</p> <p>3 I can't get any pleasure from the things I used to enjoy.</p> <p><b>5. Guilty Feelings</b></p> <p>0 I don't feel particularly guilty.</p> <p>1 I feel guilty over many things I have done or should have done.</p> <p>2 I feel quite guilty most of the time.</p> <p>3 I feel guilty all of the time.</p>	<p><b>6. Punishment Feelings</b></p> <p>0 I don't feel I am being punished.</p> <p>1 I feel I may be punished.</p> <p>2 I expect to be punished.</p> <p>3 I feel I am being punished.</p> <p><b>7. Self-Dislike</b></p> <p>0 I feel the same about myself as ever.</p> <p>1 I have lost confidence in myself.</p> <p>2 I am disappointed in myself.</p> <p>3 I dislike myself.</p> <p><b>8. Self-Criticalness</b></p> <p>0 I don't criticize or blame myself more than usual.</p> <p>1 I am more critical of myself than I used to be.</p> <p>2 I criticize myself for all of my faults.</p> <p>3 I blame myself for everything bad that happens.</p> <p><b>9. Suicidal Thoughts or Wishes</b></p> <p>0 I don't have any thoughts of killing myself.</p> <p>1 I have thoughts of killing myself, but I would not carry them out.</p> <p>2 I would like to kill myself.</p> <p>3 I would kill myself if I had the chance.</p> <p><b>10. Crying</b></p> <p>0 I don't cry anymore than I used to.</p> <p>1 I cry more than I used to.</p> <p>2 I cry over every little thing.</p> <p>3 I feel like crying, but I can't.</p>
--	--

Please continue on the back.

**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.

---

- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.

---

- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.

---

- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.

---

- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.

---

- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.

---

- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

**Thank you for taking the time to complete this questionnaire.**

Please return to Nicky Smart at Ninewells, in the envelope provided.

## **6.4 APPENDIX FOUR**

### **Part one:**

**Matching of each Control group member with ACU Waiting List member.**



## Men

ACU Waiting List Group			Matched Control Group		
ResearchNo.	Age	Level of Qal	ResearchNo.	Age	Level of Qual.
75	30	4	121	30	3
63	31	2	117	30	2
10	31	2	108	32	2
29	32	2	111	32	3
3	32	1	120	32	2
15	33	4	123	32	4
1	34	2	130	34	2
2	34	4	106	34	4
34	34	2	109	34	3
85	34	2	115	34	2
21	35	3	118	35	2
38	35	3	119	35	4
6	36	4	102	36	3
9	36	4	112	36	3
39	36	4	113	36	3
25	37	5	129	36	5
35	37	3	122	38	2
80	37	4	110	37	4
93	37	2	107	37	2
4	37	2	124	38	2
33	39	1	101	39	1
69	40	2	127	39	2
91	40	3	125	39	4
18	41	3	116	40	2
53	41	2	131	41	2
26	42	4	105	42	4
76	42	5	128	42	5
87	42	3	126	42	3
95	42	3	104	42	2
45	44	1	103	43	2
92	57	5	114	56	5

## Women

ACU Waiting List Group			Matched Control Group		
ResearchNo	Age	Level ofQual	ResearchNo.	Age	Level ofQual.
85	28	4	120	28	4
75	29	4	121	29	4
63	30	5	107	30	4
4	31	2	131	31	2
10	31	2	122	31	2
15	31	3	118	31	3
21	31	3	111	31	3
53	31	4	127	31	4
3	32	2	130	32	2
18	32	2	110	32	2
29	32	3	119	32	3
33	32	2	123	32	2
34	32	4	108	32	5
38	32	2	125	32	2
9	34	2	124	35	1
35	35	4	104	34	4
80	35	4	103	35	4
93	35	3	109	35	3
6	36	4	113	35	4
25	36	5	128	37	4
26	36	4	117	35	4
45	36	2	105	36	2
79	36	2	106	36	2
91	36	1	130	36	2
95	37	2	126	37	3
69	38	4	116	38	4
87	38	3	102	38	2
92	38	4	114	38	4
11	39	4	115	39	4
1	40	3	112	40	3
76	41	3	101	42	2

## **6.5 APPENDIX FIVE**

### **Part One of Analysis**

#### **Statistical Results**

**Hypothesis 1:****Table showing results of transformations on the BAI and BDI – II.**

	Original.		Transformed.	
	BAI	BDI - II	BAI LG10	BDI – II SQRT
Skewness	2.448	1.307	0.005	0.022
Std. Error	0.217	0.217	0.224	0.217
Kurtosis	8.0006	2.442	0.414	0.209
Std Error	0.431	0.431	0.444	0.431

**Table showing results of t-tests:**

Variable	ACU Mean (SD) N=62	Control Mean (SD) N=62	t-value	df	Significance (One-tailed)
BAI	7.18(5.26)	7.27(9.28)	1.29	115	NS
BDI	9.97(5.85)	5.23(6.16)	5.29	117	< <b>0.001</b>
PSS	26.90(7.52)	16.95(8.70)	6.81	122	< <b>0.001</b>
IoE	29.45(13.7)	14.44(15.90)	5.62	122	< <b>0.001</b>

**Hypothesis 2:**

No transformation necessary.

**Table showing all results of Chi square statistics for each of the variables**

Variable	Caseness ACU (N=62)	Caseness Control (N=62)	X <sup>2</sup>	df	Significance (Two-tailed)
BAI	24	19	0.89	1	NS
BDI	19	4	12.01	1	<b>P&lt;0.001</b>
PSS	20	10	28.01	1	<b>P&lt;0.001</b>
IoE	40	11	4.39	1	<b>P&lt;0.05</b>
2 or more	34	10	20.29	1	<b>P&lt;0.001</b>
All variable	6	3	2.13	1	NS

**Hypothesis 3:****Table showing transformations on the BAI.**

	BAI	BAI LG10
Skewness	1.057	.774
Std. Error	0.304	.304
Kurtosis	0.837	.765
Std Error	0.599	.599

**Table showing the non-significant effects and F values for the ANOVA s for each of the variables.**

Variable	Main effects	F	df	Significance (One/Two-tailed)
BAI	Index	4.07	1	NS
	Gender	18.495	1	P < 0.001
	Index*Gender	0	0	NS
BDI	Index	0.006	1	P < 0.01
	Gender	6.317	1	NS
	Index*Gender	0	0	NS
PSS	Index	0.053	1	NS
	Gender	2.51	1	NS
	Index*Gender	0	0	NS
IoE	Index	0.051	1	NS
	Gender	4.181	1	P < 0.05
	Index*Gender	0	0	NS

**Hypothesis 4:**

No transformations necessary.

**Table illustrating results of t-test.**

Variable	Younger Group Mean(SD) N=15	Older Group Mean(SD) N=16	t-value	df	Significance (one-tailed)
BAI	10.7(5.4)	9.1(5.7)	0.805	29	NS
BDI	14.5(6.3)	11.4(4.3)	1.50	29	NS
PSS	31.9(6.0)	26.9(6.8)	2.14	29	NS
IoE	38.8(12.0)	33.4(8.6)	1.45	29	NS

**Hypothesis 5:**

No transformations of the data set necessary.

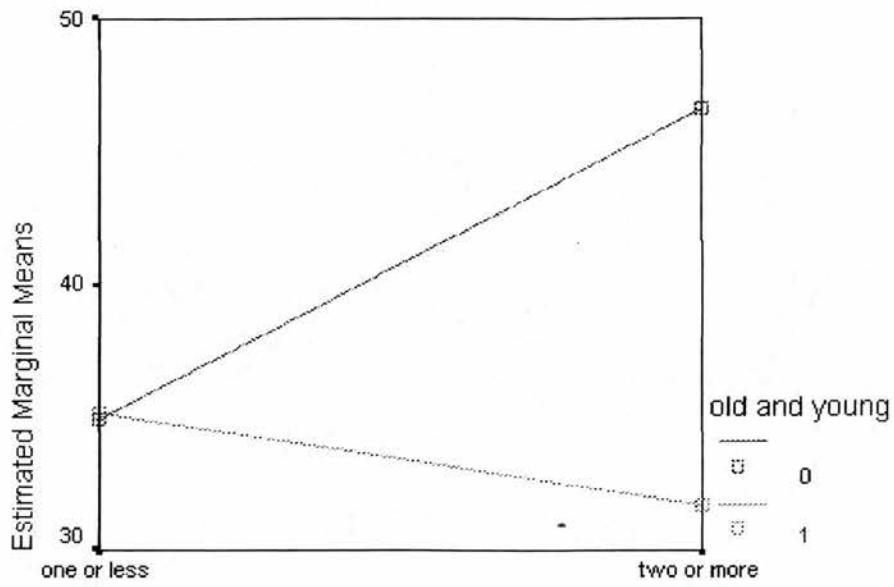
**Table showing the results for all of the variables of each of the ANOVA investigations.]**

Variable	Main effects	F	df	Significance (One/Two-tailed)
BAI	Age	1.03	1	NS
	No. of Cycles	2.58	1	NS
	Age*No. Cycles	0.054	1	NS
BDI	Age	4.05	1	NS
	No. of Cycles	7.19	1	P < 0.05
	Age*No. Cycles	0.013	1	NS
PSS	Age	6.6	1	NS
	No. of Cycles	4.7	1	NS
	Age*No. Cycles	0.02	1	NS
IoE	Age	4.06	1	NS
	No. of Cycles	1.31	1	NS
	Age*No. Cycles	4.32	1	P < 0.05



**IOE interaction profile:**

**Estimated Marginal Means of IOE overall scor**



ONE

## **6.6 APPENDIX SIX**

### **Part Two of Analysis**

#### **Statistical Results**

**Hypothesis 6:****Table showing results of transformations on the BAI and BDI – II.**

	Original.		Transformed.	
	BAI	BDI - II	BAI SQRT	BDI – II SQRT
Skewness	1.999	1.518	0.803	0.408
Std. Error	0.230	0.230	0.230	0.230
Kurtosis	4.227	2.230	0.538	0.342
Std Error	0.457	0.457	0.457	0.457

**Table showing means and standard deviations for each group and t-test results for each of the variables.**

Variable	Waiting List Group Mean (SD) N=62	Treatment Group Mean (SD) N=48	t-value	df	Significance (One-tailed)
BAI	7.18(5.26)	9.89(8.43)	-1.897	108	NS
BDI	9.97(5.85)	11.63(9.08)	-0.502	108	NS
PSS	26.90(7.52)	24.85(7.57)	1.41	108	NS
IoE	29.45(13.72)	26.13(14.36)	1.24	108	NS

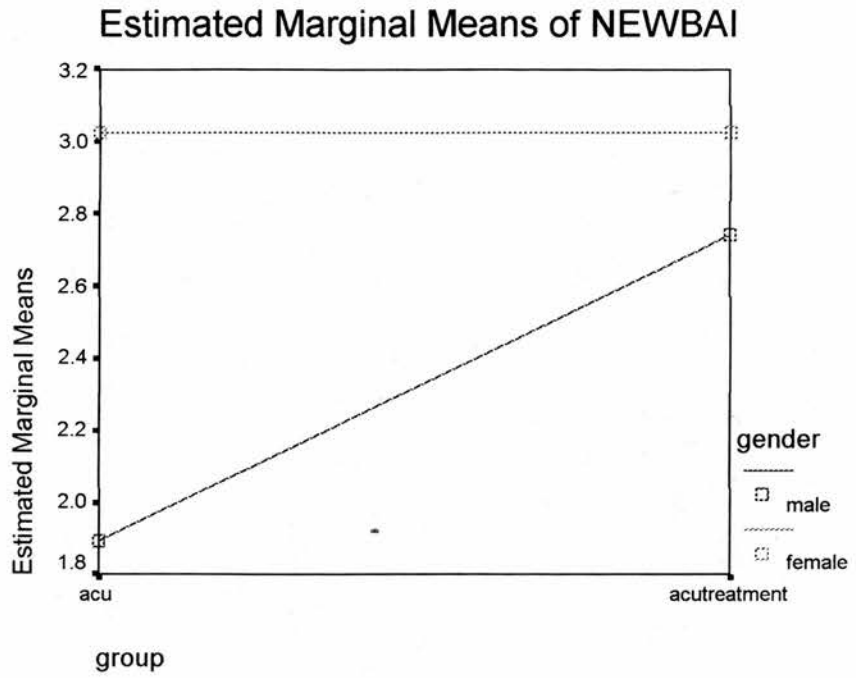
**Hypothesis7:****Table showing results of transformations on the BAI and BDI – II.**

	Original.		Transformed.	
	BAI	BDI - II	BAI SQRT	BDI – II SQRT
Skewness	1.696	.999	0.281	0.016
Std. Error	0.230	0.230	0.230	0.230
Kurtosis	3.624	1.106	0.567	0.182
Std Error	0.457	0.457	0.457	0.457

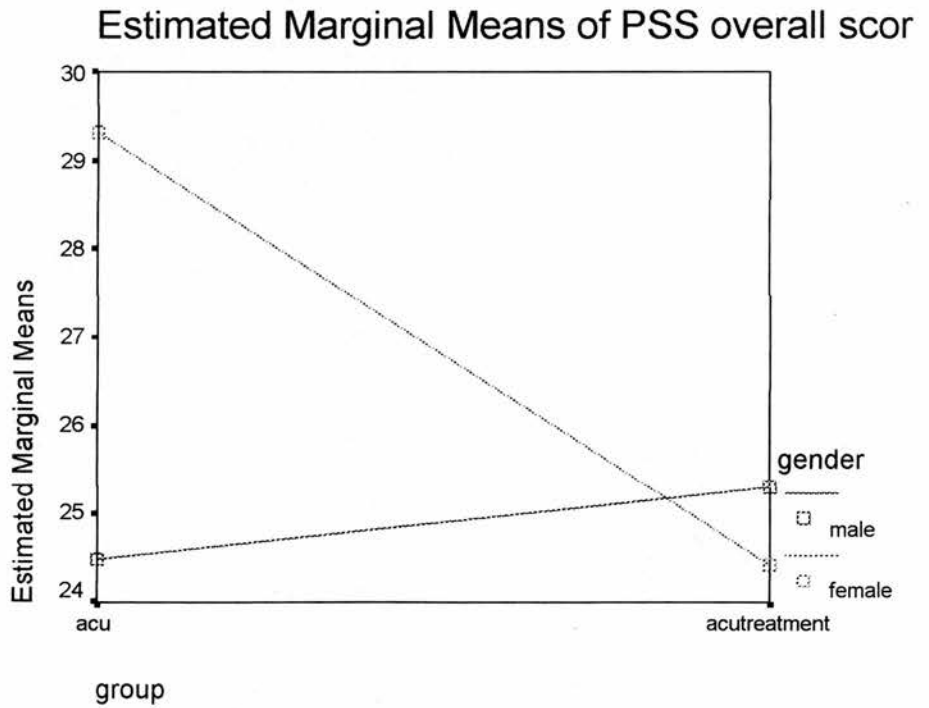
**Table showing the results for all of the variables of each of the ANOVA investigations.]**

Variable	Main effects	F	df	Significance (One/Two-tailed)
BAI	Group	11.61	1	P < 0.05
	Gender	4.124	1	P < 0.05
	Group*Gender	4.125	1	P < 0.05
BDI	Group	0.287	1	NS
	Gender	14.5	1	P < 0.001
	Group*Gender	1.16	1	NS
PSS	Group	2.086	1	NS
	Gender	1.951	1	NS
	Group*Gender	4.45	1	P < 0.05
IoE	Group	1.890	1	NS
	Gender	26.852	1	P < 0.001
	Group*Gender	0.066	1	NS

**BAI interaction Profile:**



**PSS interaction Profile:**



**Hypothesis 8:****Table showing results of the Chi-Square analysis:**

Factor	Non-Stressed Group N= 23	Stressed Group N=25	X <sup>2</sup>	df	Significance (Two-tailed)
Financial	19	28	2.78	1	NS
Physical	21	41	10.3	1	<b>P&lt;0.01</b>
Group	19	25	0.73	1	NS
Stress	10	28	11.73	1	<b>P&lt;0.001</b>
Stigma	21	28	1.73	1	NS

**Hypothesis 9:****Table illustrating number of individuals in each group.**

	Not caseness on 2 measures Non-stressed (N = 23)	Caseness on 2 measures Stressed (N=25)
Did not wish to attend	17	20
May wish to attend	6	5

**Results of Chi-Squared analysis on the above data = X<sup>2</sup> = 0.251; df = 1; p>0.05.**