1.1 Background of the study

Dating back to the time of Freud and Erikson, it was believed that psychogenic causes were seen as the core of infertility problems (Burns & Covington, 1999). In the early 1950s, reports first started to appear connecting the relationship of psychology and the inability to conceive (Rothman, Kaplan & Nettles, 1962).

Stress is an activator of a massive conditioned non-specific reaction to prepare for appropriate coping with an actual or anticipated threat. Stress may be of two types: 1) Eustress (Eu means pleasant) is a stress of achievement, triumph and exhilaration, 2) Distress is a stress of disappointment, inadequacy, defeat and helplessness.

**Stress in Women in general**

Stress is the "wear and tear" of our bodies experience as we adjust to our continually changing environment; it has physical and emotional effects on us and can create positive or negative feelings.

“Stress” is the relationship between person and environment. When the external and internal demands of women exceed their coping resources, it may impact their general wellbeing. Then those demands are termed as stressors.

Woman in the social context or family relationship is stressful depending on their cognitive appraisal. The stimuli or event appraised as threatening or harmful results in reaction to various stressors. Health Grades (2010) patient profile survey for
stress stated that 71% of women reported as stressed as compared to men 29%. Women exhibit more symptoms (70.0%) than men (30.0%).

In general, stress can arise from a variety of reasons; can be brought about by a traumatic accident, death, or emergency situation, also be a side effect of a serious illness or disease. Stress can be associated with daily life, a workplace, and family responsibilities. It is very difficult to stay calm and relaxed in every day hectic life style. A woman may have many roles: spouse, mother, caregiver, friend, and / or worker. With all that going on in a woman’s life, it seems almost impossible to find ways to de-stress. But it is depends on how a woman adopts to it.

According to the definition of stressors as mentioned above, there are some situations or events that are appraised as stressful which lead to increased distress. These stressors differ from general stressors faced by people every day because they are specific to infertility experience and diagnosis for infertility. The emotional and physical reactions to stress are partly determined by the sensitivity of the sympathetic nervous system. This system produces the fight or flight reaction in response to stress and excitement.

The symptoms of stress are disturbed in sleeping, headaches, constipation, diarrhea, irritability, lack of energy, lack of concentration, eating too much or not at all, anger, sadness, higher risk of asthma and arthritis flare-ups, tension, stomach cramping, stomach bloating, skin problems, like hives, depression, anxiety, weight gain or loss, heart problems, high blood pressure, irritable bowel syndrome, diabetes, neck and / or back pain, less sexual desire and harder to get pregnant.
Coping by women in general

Lazarus suggests that coping involves problem focused and emotion focused coping. Social problem-solving views stress as a function of the reciprocal to the three major variables such as stressful life events, emotional stress responses and problem solving coping. The energy that accumulates in the body to meet this "emergency" must be discharged in order to bring the body back into balance. Repeated episodes of failure in treatment can lead to emotional burnout and eventually complete exhaustion. During that time women may respond with either fight or flight to manage stress. To manage the stress American Psychiatric Association (2008) gave tips that health consequences of extreme stress are most severe when people ignore symptoms and fail to manage their stress well. Natural Wellness Care also encourages people to manage the stress before it manages the human being.

Women with infertility

Since the beginning of history the phenomena of reproduction has been the essence in the continuity of human race. Motherhood is considered as the central and defining role for a woman. Especially in Indian culture pregnancy is considered as an important role to carry forward the family name.

Kumar (2007) carried out a study in the Kusmi block of the Sidhi district of Madhya Pradesh in Central India. The data were collected by trained investigators through a structured interview scheduled in April 2002. A total of 1305 people were studied from 284 households. Among 778, 133 eligible couples belonged to the Khairwar tribe; out of a population of 527 people, 99 eligible couples belonged to non-Khairwar tribes. The results revealed the prevalence of infertility to be higher in the Khairwars compared to non-Khairwars.
Universally every married couple wishes to have their biological child. But the chance of achieving successful pregnancy by the perfect couple is about 80 – 90%. The rest of the 10% are considered as infertility. Carcio (1999) has explained that the probability of becoming pregnant during each cycle of menstruation is 25% in normal fertile couples. The cumulative pregnancy rate during a 12 month period is 85%. He further explained that after 12 months of unsuccessful pregnancy attempts, a cause should be explored because the likelihood of being normally fertile reduced to only 15%. Akkar (2001) found half (out of 275) of the infertile women felt infertility as the most upsetting experience in their lives, as compared to 15% of the men.

Infertility can be defined as ‘the inability of a couple to achieve conception or to bring a pregnancy to term after a year or more of regular, unprotected intercourse'. (WHO, 2006). Infertility can be classified as either “primary” or “secondary”. Primary infertility occurs when there has been no successful pregnancy, whereas secondary infertility occurs after there has already been a pregnancy and the couple is unable to conceive after one year.

Peterson (2003) stated that one in six American couples will be affected by infertility during their childbearing years and 18% of women have difficulty in conceiving or carrying a viable child. Stanton (2002) estimates 15% of recognized pregnancies result in spontaneous abortion (i.e., miscarriage) prior to 20 weeks gestation and approximately 1% of pregnant women have experienced two or more miscarriages.
Incidence of infertility

The statistics used for prevalence/incidence of Female infertility are typically based on US, UK, Canadian or Australian prevalence or incidence statistics, which are then, extrapolated using only the population of the other country. This extrapolation calculation is automated and does not take into account any genetic, cultural, environmental, social, and racial or other differences across the various countries and regions for which the extrapolated Female infertility statistics below refer to. - US Census Bureau, Population Estimates, 2004.

Table – 1 Female infertility in Southern Asia (Extrapolated Statistics)

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Extrapolated Incidence</th>
<th>Population Estimated Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>209,659</td>
<td>28,513,677²</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1,039,268</td>
<td>141,340,476²</td>
</tr>
<tr>
<td>Bhutan</td>
<td>16,070</td>
<td>2,185,569²</td>
</tr>
<tr>
<td>India</td>
<td>7,831,401</td>
<td>1,065,070,607²</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1,170,561</td>
<td>159,196,336²</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>146,361</td>
<td>19,905,165²</td>
</tr>
</tbody>
</table>


Infertility is a global health issue. In some societies of Sub-Saharan Africa (known as the ‘infertility belt’) one-third of all couples are unable to conceive during their reproductive lives.
Infertility statistics

- One in six couples is infertile. In 40 per cent of cases the problem lies exclusively with the male, 40 per cent with the female, 10 per cent with both partners, and in a further 10 per cent of cases, the cause is unknown.
- Fertility problems strike one in three women over 35.
- One in 25 males have a low sperm count, and one in 35 are sterile.

Thangam Varma (2006) head of the department of reproductive Medicine & women’s hospital said that in India one in five couple is suffer from work related stress, life style changes – smoking, drinking alcohol, causal relationship induced infection major reason for reduced sperm production.

National collaborating centre for women’s and children’s health (2004) reported the prevalence of infertility to be around 14% in European countries, affecting one in seven couples. Of all couples attempting to conceive, 16% are unsuccessful after 1 year. This reduces to 8% after 2 years and 7% after 3 years. National health science and center for research development (2000) categorized infertility into unexplained (30%) or secondary to ovulatory failure (27%), male factors (19%), tubal factors (14%), or endometriosis 5%. WHO (2008) reported between 2-10% of couples worldwide are unable to conceive primarily, about 60-80 million couples in the world are infertile, and 10% of fertile couple fail to conceive with their first year of attempt and 5% after 2 yrs. Further 10-25% couple experience secondary infertility about 15% couples of child bearing age seeking medical help. Among these couples causative factors are found in about 30-40% of female; 10-30% of males and 15-30%, the both partners have abnormalities.
WHO (2006) epidemiological studies quoted that the prevalence rates for infertility in India as 3% in primary and 8% in secondary infertility. The article further explained that in India, data from various community-based studies on childlessness from different states show between 5 to 18 percent of the women reporting childlessness as one of their gynecological problem. Childlessness varies across the states. While Haryana and Assam showed an infertility rate of 1.4%, Andhra Pradesh showed infertility rate of 4.4%. The estimated rate of infertile couples in India is approximately 17.6 million. Health action (2000) reported that the infertile women undergo extensive investigation and treatment procedures; they spend many years in an attempt to become pregnant. It is also reported that 12-56% conceived over a period 2-3 years. 38% conceived before treatment was started and 27% while diagnostic procedures were being carried out; only 35 percent complete the treatment before onset of pregnancy.

Jacky Boivin (2007) study reported that the prevalence of infertility came from 25 population surveys sampling 1,72, 413 women. The International estimate of infertility prevalence rate was 9% (12 months). The 12-month prevalence rate ranged from 3.5% to 16.7% in more developed nations and from 6.9% to 9.3% in less-developed nations, with an estimated overall median prevalence of 9%. In 17 studies sampling 6410 women, the proportion of couples seeking medical care was, on average, 56.1% (range 42–76.3%) in more developed countries and 51.2% (range 27–74.1%) in less developed countries. The proportion of people actually receiving care was substantially less, 22.4%. Based on these estimates and on the current world population, 72.4 million women are currently infertile; of these, 40.5 million are currently seeking infertility medical care.
Infertility is not merely a health problem; it is also a matter of social injustice and inequality. When women experience infertility, it leads to emotional upsets due to an overreaction of the sympathetic system. The sympathetic nervous system always is poised to react to a crisis, meaning placing the body in a state of constant tension. Women tend to react even to low stress in the same way as they would react to real emergencies. Sandhya Ravichandran (2007) gave statistics emerged out of an independent survey conducted on IT and IT-enabled service sector employees in Chennai showed that 12% couples were infertile.

Schmidt’s (2006) epidemiological and demographic studies investigated the prevalence of infertility differed in how they defined the numerator (the infertile participants) and the denominator (the population at risk) among Danish women. Study revealed the lifetime prevalence of infertility in the representative population-based study as 26.4%. In the age group 35 to 44 years 5.8% were primarily involuntarily in fecund (involuntarily childless). Even in a country with access to fertility treatment in a public health-care system without self-payment lower education was a predictor of lower treatment seeking. After thorough medical investigations, the causes of the fertility problem remained unexplained in only a minority of infertile couples (5-10%). This is called unexplained infertility.

Bio statistical and epidemiological studies conducted at Council's National Institute of Epidemiology (NIE), Chennai and Institute for Research in Medical Statistics (IRMS), New Delhi during 2003 -2004 stated that in developing countries like India, infections of the womb such as Gonorrhea, Chlamydia and Tuberculosis significantly contributed to infertility.
Though both men and women are equally biologically affected from infertility, the most common causes of female infertility are ovulatory disorders and anatomical abnormalities such as damaged fallopian tubes. Less frequent causes include, for example, endometriosis and hyper prolactinemia and thyroid gland related problems. Allison (2000) stated approximately 8% of Canadian couples have difficulty conceiving; women older than 35 years have problem of infertility for more than 12 months; whereas women younger than 35 years have problem of infertility more than 18 months; and women are likely to have such problems as anovulation, tubal disease, or endometriosis.

When fertility fails, the couples become psychologically depressed, feel frustrated and guilty; whereas some women get angry to their fate and blame each other for the failure. Instead couples can begin to view themselves constructively rather than viewing their fertility as failure. Most studies have come to the conclusion that infertile couples differ moderately from fertile couples.

Kee (2000) compared the level of stress in infertile women with fertile women in different stages of medical investigation for the infertility. One hundred thirty-eight (138) women receiving medical treatment for infertility were administered the State Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI). Infertile women showed significant increases in trait anxiety and depressive symptoms than the fertile women. Anxiety and depression in the In Vitro fertilization (IVF)-failed women were significantly higher than the IVF-success women. According to the duration of infertility, STAI and BDI were moderately elevated in the first stage (< 3 year). There was a decreased psychological stress with advanced infertility duration.
On depression scales, the intermediate and final duration of infertility patients showed less symptomatology than the first-stage patients.

**Gender difference in perception of infertility**

The incidence of infertility in men and women is almost identical. Infertility is exclusively considered as a female problem in 30-40% of the cases and exclusively a male problem in 30-40% of the cases. Problems common to both partners are diagnosed in 10-15% of infertile couples. Hsu (2002) found in their study that wives had more emotional disturbances than husbands. Infertility is not something that just occurs within the couple, it occurs in a wider social context. Most Americans believe that married couples should have children and should want to have children. Infertile women have to live with not only their own inability to live up to the norms to which they subscribe, but they also have to live with not meeting others' expectations derived from these norms. Rather than infertility being a static condition with psychosocial consequences, infertility is a dynamic and socially conditioned process whereby couples come to define their inability to bear their desired number of children as problematic and attempt to rectify the situation. The experience of infertility is negotiated between the couple with influences from medical personnel, relatives, friends, and acquaintances, as well as from a generalized sense of society as a whole. Though the cause of infertility may be present in both men and women, it is the women who are always being pressurized by the family members. Women believe that they alone are responsible for conceiving a child and feel that they possess the control over to go through the process of treatment. They feel it as a challenge for their feminism. Anderson (2003) found that women reported significantly greater infertility-related concerns regarding life satisfaction, sexuality, self-blame, self-esteem, and avoidance of minds compared with males. Infertility becomes a public
health problem since it has got social implication and with higher level of prevalence. It causes undue stress and strain on the family life and social life as well. Couples tend to manifest behavioral conditions and maladjustments to social pressures and individual frustrations at the failure to have children.

**Emotional reaction of women with infertility**

The emotional reaction towards infertility is anger. This reaction being normal one, is acceptable and be received with empathy. Usually reassurance may be more effective in reducing anger. Depression is seen when the sense of failure intensifies; women become more isolated from social activities and friends. Sometimes they may be triggered by events that remind them of their problem such as birth of someone else’s baby, the announcement of a pregnancy, children’s birthday parties.

Geller (2004) stated that pregnancy and childbirth are typically associated with positive emotions. But when a woman fails to conceive within a year even without unprotected intercourse it may affect her total wellbeing. The next emotional reaction is guilt. Infertile women may feel guilty of not fulfilling her husband’s desire of having their biological child. Couples who have had a history of termination of their first pregnancy and cannot conceive second time may have difficulty in coping with their feeling of guilt. They may feel that they are being punished for rejecting their first baby. Similarly, some individuals may feel that they are being punished for past sexual activities. Loss of control may be seen in women more than in men because women experience medical treatments, monitor their bodies for pregnancy, and initiate medical interventions more often. Women may find themselves increasingly despairing at the time when she feels of never becoming pregnant. Sometimes social occasions or functions also may give rise to loom for women and they begin to dread
social occasions. They may also get isolated from family members and work colleagues. Schiff (1998) states years ago the stress theory that contributed to infertility was identified and accepted in the psychological and medical world.

**Effect of stress on IVF outcome**

It is known that infertility treatments are very stressful for couples. The family doctor, specialist and 'support group' may be available to help couples. Support groups consist of couples who go through or have experienced infertility and its treatments, their support and guidance can often prove invaluable. Infertility couples also recognize that infertility treatment does not produce immediate results and with patience, a positive attitude and appropriate treatment, most infertile couples eventually become parents. The treatment of infertility requires interviewing them on physical and sexual activity, medical examinations after intercourse, charting temperatures, scheduled intercourse, daily injections, ongoing blood level monitoring, and diagnostic and reconstructive surgeries (Gibson, 2002).

Assisted conception is a form of infertility treatment by a specialist that increases the chance of becoming pregnant by the infertile women. Some relate assisted conception specifically to artificial insemination and IVF. IVF - In Vitro Fertilization literally means fertilization outside the body. In vitro (Latin: within the glass) refers to the technique of performing a given biological procedure in a controlled environment outside of a living organism; for example in a test tube. IVF means that the eggs are fertilized outside the body. The treatment involves removing eggs from the ovary; fertilizing them in the laboratory with sperm and replacing them into the woman's uterus. This treatment is highly confidential. It is known that IVF treatment is extremely stressful, and for many couples the
implications of IVF are considerable one emotionally, financial costs are high, treatment itself is intrusive and time consuming, In addition it may affect personal, marital, and social and work activities. The psychological state of couples undergoing IVF treatment may vary at different stages of treatment, the most stressful stage being the wait for the outcome of the treatment. When an outcome of treatment is an unsuccessful one, the emotional reactions towards it may lead to depression, anxiety, poor self image and feeling of unfulfilment.

There are several possible reactions that infertile couples may experience while undergoing investigations. It is important to realize that couples are different, and will react in different ways. Eugster (1999) studied psychological reactions of both women and men during the treatment, and waiting for the outcome of the IVF-treatment. The common reactions during IVF are anxiety and depression, while after an unsuccessful IVF both expressed feelings of sadness, depression and anger. Findings revealed psychosocial factors like ineffective coping strategies; anxiety and depression were associated with a lower pregnancy rate following IVF-procedures. Study suggests that stress reduction through relaxation training or behavioral treatment can improve the conception rates.

The diagnosis and treatment stages can be described as lengthy, emotional, financially taxing, physically invasive, embarrassing, time-consuming and uncertain. The experience of infertility and IVF treatment can be considered as a major life stressor characterized by unpredictability of result, poor control over the process, and unwanted waste of money. Sieber (2001) examined issues related to pregnancy achievement, live birth deliveries, and infant characteristics including birth weight and multiple births to identify a relationship to prenatal stress. They found using the
Positive and Negative Affect Scale (PANAS) that baseline scores negatively influenced the number of oocytes retrieved and embryos transferred. A higher expectation of pregnancy was associated with greater number of oocytes fertilized and embryos transferred. Study findings revealed that attitudes towards infertility were related to negative outcomes in live birth delivery, infant birth weight and multiple births. Study suggests that psychological stress affected the outcome of IVF treatment since the state anxiety levels increased among those who did not achieve pregnancy to a slightly higher range than those who became pregnant.

The uncertainty of infertility disrupts many life goals. For an example deciding to take a new job or moving to a house can be delayed because of infertility. Couple faces financial expenses and takes off their entire life time from work due to frequent doctor visits. Sami (2006) reported infertility affects all dimensions of health including physical, emotional, financial, social and psychological. Findings revealed that certain investigation procedures and treatments increased distress in couples, particularly women. Infertile couples may have to spend many years to become pregnant. The cost of infertility treatment may also cause economic burdens and influence the utilization of treatment options and continuing the advised treatments. It may add on to strain the spousal and family relationships. The cost of treatment and level of family support may also add on stress to bring change in the treatment seeking behaviors of women and treatment outcome.

Ebbesen (2009) studied the impact of stress on the chances of achieving a pregnancy with in-vitro fertilization (IVF). Women explored the association between IVF-outcome and negative, i.e. stressful life-events during the previous 12 months prior to IVF. 809 women (mean age: 31.2 years) completed the List of Recent Events
Women who became pregnant reported fewer non-fertility-related negative life-events prior to IVF (Mean: 2.5; SD: 2.5) than women who did not obtain a pregnancy (Mean: 3.0; SD: 3.0) (t (465.28) = 2.390, P = 0.017). Logistic regression analyses revealed that the number of negative life-events remained a significant predictor of pregnancy (OR: 0.889; P = 0.02), when controlling for age, total number of life-events, perceived stress within the previous month, depressive symptoms, and relevant medical factors related to the patient or treatment procedure, including duration of infertility, number of oocytes retrieved and infertility etiology. Woman loses her interest in sexual activities and each month she is reminded of her infertility problems when she menstruates. This was often described “roller-coaster” of emotions that rise and fall with each unsuccessful month (Gerrity, 2001).

Influence of stress hormone

Stress is any situation that results in a reaction in the body called the stress response. The stress response is how the body responds to everyday challenges as well as to more threatening or dangerous situations. The stress response is also known as the "fight or flight" response. In the stress response, the body pumps up its ability to effectively respond to threats, hardships, and adversity in order to increase its chances of survival. The stress response results in the release of cortisol, a hormone that increases blood glucose levels and stimulation of the sympathetic nervous system, leading to the release of catecholamine, especially epinephrine (adrenaline). Catecholamine induces vasoconstriction and increases in heart rate and blood pressure. This increases the amount of nutrients and oxygen that is available to the muscles to react to a situation during the stress response. Csemiczky (2000) compared the stress levels in women entering IVF treatment with those of fertile. The
state anxiety and personality profiles as well as stress hormones were studied in 22 normally menstruating women entering IVF treatment for tubal infertility. The results showed infertile women had significantly higher scores of suspicion (p>0.05), guilt (p>0.05), and hostility (p>0.01), but lower somatic anxiety (0.05) and indirect aggression (0.05) than fertile controls.

Domar (2000) recognized that from the biblical times the stories indicate the prevalence of the impact of anxiety and depression on fertility. In the Book of Samuel, stressed out that the stress theory related to infertility arose due to the somatization of psychological pressures and conflicts. Later it was suggested that it was functional or medically unexplained infertility. Researchers have verified that infertility does cause stress. Facchinetti (1997) documented that the higher a woman’s vulnerability to stress the lower her pregnancy rates. Sharma and Sharma (1992) documented the pregnancy rates to be double in women who took anti anxiety pills.

We know that the mind (psyche or soul) can influence physiological responses. Just think of the emotion of fear. When women experience fear, there are
distinct bodily symptoms such as dry mouth, pounding heart, sweaty palms, etc. that accompany the emotional feeling.

Wasser Samuel (1993) described about how indentified that hormonal problem showed higher level of stress. Infertile women

Perceived Infertility (Threatening Event)

Response

(Fight / Flight)

During that response activates

Hypothalamus / Pituitary / Adrenal System Releases Neurotransmitters

Catecholamine

Primary stress hormone

Activates on

Reproductive Hormone (LSH, FSH, Estrogen)

Stop ovulation process

Failure to conceive

David (2002) stated that an intimate connection exists between the body and mind. The stress due to treatments has been found to be contributing to a variety of sexual dysfunctions, such as loss of libido, premature ejaculation, impotence and the
inability to achieve an orgasm. Increased levels of anxiety and reduced spontaneity in sexual interactions have been found to lead to diminished interest in sexual activity and decreased sexual satisfaction (Burns, 1999).

**Effect of infertility in women**

Though the prevalence of infertility is high in India, assessment of infertility seems to be the tip of an iceberg of the disease in the reproductive age group. There are not many studies in a general outpatient clinic or in patient department, where infertility women are screened for emotional reaction with infertility. Hence even if it is manageable, the delay in assessing the emotional state may lead to high morbidity and mortality as evidenced due to various domains of stress among infertility women. Danilak (2000) reported that there are 3 aspects of marital relationships. Various aspects in the degree of relationship, sexual and romantic aspects and rating of a marriage as a friendship were identified. Swan (2000) explained the term ‘marital quality’ as the degree of understanding, satisfaction, decision making, trust and role functioning among the couples.

The stress of infertility causes varied responses in individuals who are going through the experience. Some of these reactions are behavioral, cognitive, emotional, physiological and social. There are very few studies that examined specifically infertility related stressors. The Fertility Problem Inventory, utilized measures of infertility distress. They measured the stressors in five domains like, social concern, sexual concern, relationship concern, need for parenthood concern and child free lifestyle. The existing negative attitudes and beliefs about infertility are bound to contribute to a couples' sense of despair, distress and morbidity. Distress is the physiological or psychological reaction that occurs as a result of stressors. The
infertility women feel depressed, anxious, and guilty. The common emotional responses are anger, guilt, shock or denial, grief and depression, and anxiety. Receiving a diagnosis of infertility is a significant life crisis. Women feeling grief and loss are very common as she come to understand the fact that she is not able to conceive. This may result in a decrease in quality of life and an increase in marital discord and sexual dysfunction.

**Women coping with infertility**

The ability of coping with infertility can directly and indirectly effect fertility outcome. The term coping refers to the ‘abilities of a person by cognitive and behavioral activities that make an attempt to manage a trying situation. Infertility women show varied level of coping mechanisms, especially emotion-focused versus problem-focused coping. Much of the distress experienced by infertility women can be a result of ineffective or maladaptive coping behavior. This can cause anxiousness and depressive symptoms, as well as affect their health. Therefore, social problem-solving can be an important coping. The strenuous procedure involved in dealing with infertility and treatment process may give rise to many psychosocial consequences. Social problem-solving is defined as “the self-directed cognitive behavioral process by which an individual attempts to identify or discover solutions to specific problems encountered in everyday living” (D’Zurilla, 1999). This is not to say that infertility is only a “female” problem, but to take a first step in developing a theory for why some women are more distressed and how coping skills may moderate that relationship. Coping with infertility may be related to societal attitudes towards childlessness. Cross culturally they believe that involuntary childlessness has been attributed to an act of God, punishment for sins of the past, prolonged use of contraceptives, distinct dietary habits, and the result of witchcraft.
In the cohort study (2000-2002) infertility-related communication strategy (secrecy, formal, open-minded) was identified as the coping strategies. The social differences and active-avoidance coping was a significant predictor of high fertility problem stress. Most of the time women use her ability to cope with their fertility problem by avoiding their presence with pregnant women or children, leaving the place when people talk about pregnancies and children, trying to keep their feelings within self, start continue to work or substitute activity to take her mind off things (Active-avoidance coping); Active-confronting coping – in that women may try to express their feelings to others, expect and accept sympathy and understanding from others, seek help from other childless people for advice, ask a relative or friend for advice, spend time in reading or watching television about childlessness; talk to someone about their emotions on being childless, talk to someone about how tests and treatments affect women emotionally. Sometimes they may use Passive-avoidance coping- they may hope that a miracle would happen; they feel that the only thing they can do is to wait and may dream as it living with a child, naming their child, and as taking the child for picnic with family. In meaning-based coping women deal the problem the way they have grown as a person in a good way, think about the infertility in a positive light, may find marriage / partnership even more valuable, carry out strategies to achieve other life goals instead of ruminating about infertility, and she may believe that there is a meaning to the difficulties in having children. She thinks and takes all the life events as good.

**Drop out of women from IVF treatment**

To support the above concept the psychological strain in IVF patients was explored by Kee (2000) among 1156 patients on “psychological strain in IVF patients”. Infertile women were significantly more anxious and depressed than fertile
women, both qualities of which significantly increased even more if IVF failed who underwent counseling (which included psychotherapy, hypnotherapy and relaxation exercises) had a 56.4% pregnancy rate, those who refused were 44.3%, those who were planning to but didn’t 41.9% and those who did not comment on the questionnaire 39.0% Thus he expressed that by law, Austrian physicians must offer psychological counseling to IVF patients, unless refused. Study stated that fertility problems are accompanied by a lot of emotional distress, resulting in a considerable proportion of female patients showing severe maladjustment after assisted reproductive technology. Although this interferes with their daily life, emotional distress has also shown to be related to dropout of treatment and deterioration of health behavior. Early identification of women at risk enables the provision of timely psychosocial support and on focusing psychosocial resources on those who need it most.

**Counseling for women during IVF treatment**

Many patients have enquired about the techniques used for coping with stress. Although some women attend counseling when symptoms are severe, most of them look for practical ways to manage stress on their own. They wanted to know the ways of handling their own problems by learning new techniques to improve their habits, and then practicing these techniques on a regular basis. All licensed IVF clinics in the United Kingdom are required to offer their patients counseling before proceeding with treatment. However couples do not have to accept offers of counseling if they do not feel it would be helpful. Mandatory counseling may be viewed as an unnecessary infringement on the liberty of the person participating in the program. Different countries have different legislation governing the provision of counseling for assisted conception treatment.
The basic aim of counseling is to ensure that the patient understands the implications of their treatment choice, the patient receives adequate information and emotional support, and that they can cope in a healthy way as a consequence of treatment. Counseling offers an opportunity for nurses to understand of bio-psycho-social aspects of infertile women and their treatment seeking behavior. She can be helped to design effective and successful interventions to reduce stress, promote healthy adaptation and prevent them moving towards avoidance and denial. There are various methods of counseling that can be adopted like implication counseling, which is used to enable the couples to understand the implications of the proposed treatment for themselves, their family and for any children born as a result. Next method is supportive counseling which can be used to give emotional support and information from the start of the treatment. Women come with the frustration cause by the desire for a child, or social and family pressure, or the treatment received with its limited success rate. During such time anxiety is tremendous whilst waiting results of treatment; sometimes couples are often torn between hope and fear of failure. Hearing of failure of treatment may be very difficult to handle and lead tremendous sense of grief. Counseling shall focus on particular stress at times of importance. The infertility counselors need to address these defects and detect any tensions showed by the women's poor understanding. Another method is therapeutic counseling to help couples understand their expectation including the prospects of failure and adjusting to childlessness; counseling can with time, help people adjust and accept the situation. Therapeutic counseling also focuses on certain issues such as sexual and menstrual problems. Some couples with infertility do not take up efforts of counseling for a variety of reasons. Some feel they can cope with the stress of infertility using the resources available such as supportive family and friends. Others feel unsure about
how to get such help. National Women’s Health Information Center (NWHIC) offers counseling tips to manage stressful situation as follows:

**Yoga in stress among infertility women**

Yoga is one of the complementary alternative medicines (CAM) which is widely practiced and has a definite scope in various areas of medicine especially with mental well being of an individual. It is a universal. It is an evolutionary science that deals with philosophical as well as practical aspects of life. The Bhagavat Gita says: *yogah karmasu kaushalam* means excellence in work-If women’s mind roam while in IVF treatment, she cannot hope to do it properly; *Samatvam yoga uchyate* means equilibrium of mind – to remain balanced in happiness as well as in sorrow; according to yoga *Vasistha* means of keeping the mind calm. Women with recurring symptoms of anxiety and nervous tension are usually barraged by a constant stream of negative "self-talk." Throughout the day the conscious mind gets inundated with thoughts, feelings, and fantasies that trigger feelings of upset. Many of these thoughts replay unresolved issues of health, finances, or personal and work relationships. This relentless mental replay of unresolved issues can reinforce the anxiety symptoms and be exhausting. It is important to know how to shut off the constant inner dialogue and quiet the mind. Swami Vivekananda said, “Yoga awakens the dormant Divinity that dwells in all of us”. There are programs such as meditation, yoga exercise and relaxation along with life style suggestions which are useful as behavioral stress management approaches. Yoga and meditation can help women experiencing the challenges of infertility. The practice of meditation and relaxation can help increase the clarity of the mind; maintain homeostasis of sympathetic and parasympathetic function in balancing healthy body chemical substances, and help women to undergo the rigors of infertility treatment. When a woman understands and attains physical
relaxation she tends to feel better about her and begins to treat her with more respect. Veal, L. (1998) viewed that complementary therapy focus more on holistic view of infertility treatment than do allopathic medicine.

Tuschen-Caffier (1999) cognitive-behavioral therapy (CBT) intervention was conducted with 17 infertile couples and was compared to controls over a 6-month period. Study found that live birth rate was higher in the therapy group than in epidemiological samples (6 out of 17 couples conceived within 12 months after treatment). This study attempted to behaviorally optimize the chance of conception by improving sexual satisfaction and reducing thoughts of helplessness. Specifically, they treated one group of infertile women with emotion focused coping, described as relaxation, emotional processing, and the promotion of pleasant activities and another group with problem focused strategies, including increasing control through assertiveness with medical staff and increasing infertility information. Both treatment groups reported decreased distress over controls and the emotion-focused group reported more emotional processing after the treatment. However, it was found that women in the problem-focused group were more likely to be pregnant 18 months after the intervention. There is an increasing need for awareness of psychological interventions in the infertility population.

In the present study the investigator included few relaxation and stress reduction exercises in counseling program. The author said that the feedback was very positive; many patients reported an increased sense of well being from these self help techniques. They also noted an improvement in their physical health. This chapter includes five stress reduction exercises for women with stress. It takes them through a series of specific steps to help alleviate stress symptoms. The exercises teach on the
following helpful techniques: like focusing and meditation, Shavasana, (how to feel more centered), Titali Asana and Spinal Flex (exercises that help you to relax and release muscle tension) and improve respiration and release muscle tension (Pranayama). These techniques may help to cope with stress more efficiently, make their thoughts more calm and peaceful, and help them learn to relax, while women build self esteem and self confidence. Women were requested to practice these on a regular basis.

1.2 Need for the study

“Human beings have two basic desires: To get; To be get”- Sir William Osler.

In human life stress is necessary for life and it can cause either beneficial or detrimental effect. The experience of infertility results in stress and the feeling of loss can make an impact on physical and mental well being. The term stress has been conceptualized both as an event (a distressing circumstances external to the person) and as response (the disturbance of a person’s normal state). A psychological model argues that stress is determined either by an event or by response variables. Instead of the experience of stress is a product of a combination of factors; 1) perceived meaning of an event and 2) a self-appraisal of the adequacy of coping resources? Friedman, T. (1989) sated that the inability to have children is a considerable cause of human distress. Infertility becomes a life crisis. One woman commented that everybody can see and understand the pain of a pregnant woman but no one can understand the pain of an infertility woman. Infertility can lead to feelings of hopelessness, helplessness and guilt are major threat to well being. Wischmann (2001) has done a study among 564 couples and identified the differences in psychological characteristics between couples with fertility disorders using psychological questionnaires pertaining to socio demographic factors, motives for wanting a child, dimensions of life satisfaction and
couple relationships, physical and psychic complaints, and a personality inventory. The result showed the presence of differences in psychological aspects with high educational level and a larger number with idiopathic infertility (27% of all diagnoses). There were no remarkable differences in psychological variables between the infertile couples and a representative sample, except that the infertile women showed higher scores on the depression and anxiety scales. Some couples expressed infertility crisis as a cumulative trauma, which indicate that these couples have a marked need for infertility counseling.

Infertility may influence all dimensions of stress (Hall, 2008). Personally women feel that she has lost her feminine character; emotionally develops guilt that she has the inability to produce a child; sexually she loses interest as she get menstruation every month; socially she is under pressure by relatives, friends whoever ask about children and social stigma; and culturally women are only blamed and named as barren women. Often she faces threats of divorce, pressurizing her husband for remarriage by their family members; and most of the couple happens to commit suicide. Women may develop an idea that she is only responsible for getting a child; she has the control over their infertility and gets engaged in various treatment modalities.

To support the above concept Mogobe (2005) quotes that for many women, infertility is undeniably a major life crisis and psychologically stressful, because women develop an idea; believed that she has lost her feminine character; faces social pressure; threat of divorce; often her husband is pressurized to remarry by her in – laws.
Women with Infertility experience stress in two different ways. She is conceptualizing her infertility as an event and as a response. (1) as an event - the stressor, i.e. an environmental demand, e.g. childlessness problem or undergoing a series of treatment process, (2) as a response – exhibit affective, behavioral and/or biological stress responses (i.e. disturbance in total well being, emotional reactions like denial, anger, bargaining, guilt, hopelessness, worthlessness, fantasies, depression, and isolation, withdrawn behavior, or treatment failure due to cortisol influence). The emotional experience of infertility problems results when women find the environmental demands taxing and/or threatening. At the same time she feels unable to cope with the demands due to lack of personal or environmental resources. Slade (2009) did a study among 87 women; used a Stigma consciousness questionnaire, Disclosure questionnaire, Duke-UNC Functional Social Support Questionnaire, Fertility Problem Inventory and Hospital Anxiety and Depression Scale to assess the perception of stigma associated with infertility. The findings revealed that the women reported higher stigma and disclosure than men. For women, stigma and disclosure were unrelated but in men higher stigma was associated with lower disclosure. Perceptions of stigma were related to low social support for both genders. Social support was negatively related to anxiety, depression and overall infertility distress and showed greater predictive capacity than satisfaction with partner relationship. The study suggests that the stigma should be considered on a wider social context when supporting people with fertility problems. High perception of stigma is associated with reduced disclosure to others, leading to lower social support and higher distress in new attendees at an infertility clinic. Noble (2005) stated that infertility itself has been reported as the cause of depression in women. Study further emphasized that the infertility women were found to be more neurotic,
dependent and anxious than fertile women, experiencing conflict over their femininity and fear associated with reproduction. Mehta (2005) identified that most of the therapeutic procedures performed on women caused more anxiety and depression.

In the current era, Assisted Reproductive Technology (ART) is a boon to the infertile couple offering hope to get their biological child through IVF, IUI, ICSI and so on. The process of IVF may “eat up” the entire amount of couple’s resources which include physical strain, emotional adjustment, meeting the cost of the treatment for many cycles which the couple may not be able to meet. Thereby women tend to discontinue from IVF treatment. Allen (2006) quotes that the women undergoing ART should be informed about the increased rate of obstetrical interventions such as induced labor and elective caesarean delivery. Couples suffering from infertility should be made aware of the psychological implications.

To support the above mentioned statement Van den Akkar (2005) assessed 176 Sub-fertile women seeking ART, surrogacy and adoption through retrospective study and determined whether the process (undergoing ART, surrogacy or adoption) or outcome (having a successful versus unsuccessful outcome) affected their quality of life, coping style and psychological symptoms. The study indicates that the ART group was significantly younger, had a shorter period of sub-fertility, and was least likely to have a child than the adoptive and surrogate groups. The quality of life and psychological symptoms were not significantly different between the groups, although significantly higher Mental Disengagement and Denial coping strategy scores were obtained for the ART group. The social, psychological, health and functioning quality of life, and denial coping strategies were good predictors of outcome of the group.
Study result suggested that specific counseling on coping strategies at an earlier stage may help women to cope with the reality of prolonged childlessness problem.

Peterson (2008) examined the impact of partner coping with infertility. 1169 women and 1081 men were selected before them beginning assisted reproduction treatment. The findings revealed that partner’s use of active-avoidance coping was related to the increased personal, marital and social distress for men and women. A woman’s use of active-confronting coping was related to increased male marital distress. And a partner’s use of meaning-based coping was associated with decreased marital distress in men and increased social distress in women. Study findings suggested that the partner coping patterns play a key role in a partner’s ability to cope with the infertility experience. So the nurse can help couples to understand the coping strategies that lead to increased or decreased partner distress.

Terzioglu (1999) conducted an experimental study to determine the specific problems experienced by couples participating in assisted reproductive techniques (ART) and to assess couples' counseling needs. It was also intended to determine the effects of the counseling service model, developed and implemented on the success rate of ART, and to assess the couples' anxiety, depression and life satisfaction levels. Thirty couples for the experimental group and 30 couples for the control group were included in the study. The couples in the control group experienced the routine procedures that the treatment currently includes. Couples in the experimental group took part in the counseling service model, and were informed and supported throughout the steps of the ART. Three psychological tests were given to the couples before (pretest) and after (post-test) each procedure. The results of the study showed that couples in the experimental group had lower anxiety and depression scores than
the couples in the control group. Life satisfaction scores and pregnancy rates were higher for couples in the experimental group than for the couples in the control group. Statistical evaluation showed that the difference between the experimental group and the control group was significant (p < 0.05). This study demonstrates the importance of the counseling is the role of the nurse, and emphasized on development and application of counseling services in ART centers, which would lower the anxiety and depression levels and ensure success of the treatment.

Rajvir (2000) stated that infertility is frequently perceived by the couple as an enormous emotional strain when women undergo multiple diagnostic tests, examinations and repeated number of IVF procedure. Long-term therapies and low degree of successfulness of treatment as well as economic problems caused by these treatments may lead to physical and mental complications. Schmidt (2005) recommended that counseling may help as a part of the initial infertility evaluation and an adjunctive measure during treatment, or can be a final measure to help patients cope with acceptance of their infertility problem.

It is important for fertility clinic staff not only to treat the condition of infertility but also to deal with the couples’ coping with infertility. Evidence-based knowledge about coping strategies and their consequences is therefore a prerequisite for professional fertility treatment. Coping research is conceptually complex and coping strategies are categorized differently in different studies. Inge (2010) did a qualitative and quantitative study to identify the weaknesses, strengths and needs in fertility care. The study used four focus groups with 21 infertile patients for documenting care aspects relevant to patients. The fully transcribed qualitative results were analysed and converted into a 124-item questionnaire, to investigate whether
these aspects were regarded as weaknesses, strengths or needs in fertility care. The author distributed the questionnaires to 369 eligible couples attending 13 Dutch fertility clinics. The results revealed that an overall of 286 women (78%) and 280 men (76%) completed the questionnaire. Patients experienced many weaknesses in fertility care, mostly regarding emotional support and continuity of care. Respect and autonomy and partner involvement were considered strengths in current care. Furthermore, women expressed their need for more doctors' continuity during their treatment, and couples strongly desired to have free access to their own medical record. The study result concluded that the infertile couples experienced strengths, but also many weaknesses and needed fertility care.

There is preliminary evidence suggesting that stress can cause an impact on chances of achieving pregnancy with in-vitro fertilization (IVF). Majority of the available research has focused on stress related to infertility and going through IVF-treatment. Place (2002) study assessed the supportive treatment for couples having attempted an in vitro fertilization treatment. Three groups of couples were contacted by questionnaire (successful treatment, unsuccessful treatment and outcome still unknown). The response rate of the study participants revealed that the 48% women considered it necessary to offer psychological support after the diagnosis. 80% considered it difficult to have a thorough representation of the physical aspects of an In Vitro Fertilization treatment but mostly they were surprised by their lack of an accurate emotional representation. All couples expected an availability and receptiveness from the infertility team. But the unsuccessful treatment group was less satisfied and felt significantly (P < 0.001) less well supported and the emotional support was regularly provided by the nurses and 20% wanted psychological
counseling. Two thirds of all couples considered that a psychological follow-up should be proposed to couples for whom the treatment remained unsuccessful.

Mahajan (2008) identified the intrapersonal (neuroticism, adult attachment style (AAS), perceived internal control, meaning of parenthood and intrinsic religiosity) and interpersonal (social support and marital adjustment) adjustment to infertility. A cross-sectional analysis of 85 consecutive heterosexual women was assessed using Fertility Adjustment Scale. The result of the study revealed that the intrapersonal model (49.3%) explained a larger proportion of variance than did the interpersonal model (28.4%). The perception of children as necessary for marital completion, and the avoidance type of AAS was associated with poorer adjustment and constituted intrapersonal vulnerabilities. The findings of the study highlight the merit of understanding intra and interpersonal attributes for achieving better wellbeing outcomes. The findings suggest to design and implement psychosocial interventions for women to go through the infertility treatment successfully.

In our culture the motherhood is considered to be mandatory. Women often assume that pregnancy, birth and motherhood are part of the natural progression of their lives. Choice to have a child takes place within a frame work that includes reproduction and motherhood as a woman’s biological destiny. When women are confronted with difficulty in conceiving it can shake them to their core. Peddie (2005) study examined patients' perspectives of decision-making, including circumstances influencing and satisfaction with the decision-making process. The semi-structured interviews were conducted with 25 women who had decided to end treatment after unsuccessful IVF treatment. The interviews were tape-recorded and transcribed by means of thematic analysis using the open coding technique. The study results showed that the women experienced difficulty in accepting their infertility and remained
unresolved. Early initiation of counseling is mandatory for the women during their waiting period. It may offer the platform for women to explore their repressed, unpleasant feelings and acquire insight to identify their lived experience, analyze the reason, and find strategies to manage emotional reaction during the treatment process.

Infertility patients have been called the "most neglected silent minority" because they have a loss that often goes unnoticed. In addition, they face many other often unnoticed stresses, such as the difficulties of going to work while undergoing infertility testing and treatments, the fear caused by newspaper reports of possible increased risk of cancer with ovulation agents, or the ethical problems of facilities like implanting the wrong embryos.

Verhaak (2005) carried out a longitudinal study into the course of the emotional response to IVF from pre-treatment to 6 months post-treatment and factors that contributed to that course. A total of 148 IVF patients and 71 partners completed self-report questionnaires on anxiety, depression, personality characteristics, meaning of fertility problems, coping, marital relationship and social support at pre-treatment. Assessments of anxiety and depression were repeated immediately following the final treatment cycle and again 6 months later (follow-up). Women showed an increase in anxiety and depression after unsuccessful treatment and a decrease of anxiety and depression after successful treatment. The study recommended the strategy to be followed by a nurse as part of an infertility team, for individual counseling as well as behavioral advice on relaxation training, stress management, and nutritional and exercise counseling.

The branch of complimentary alternative therapies is well accepted and affiliated all over the world. Yoga, though it is comprehensive, holistic approach, it is
not very commonly used among infertile women. Gerhard (1999) study proved infertility women in support group that included yoga, relaxation and imagery had significantly higher pregnancy rates than a control group, and higher rates of spontaneous pregnancy than a standard support group. The professional experience of the researcher shows that the effective health education programs alone are highly depended on nurses. These are delivered quite often and the vast majority of nursing related health interventions is centered on “traditional behavior change through counseling in general. Hence researcher felt that infertility women with psychological reactions and inability in coping could be helped through counseling and yoga as an intervention. This science of counseling and yoga has been given a lot of importance by the national obstetric and gynecological societies and the Human Fertilization and Embryology Authority (HFEA) code of practice in the UK, sets out that implication, support and therapeutic counseling should be available to couples in all licensed UK IVF centers. Nurses and other members of the health care team can help infertility women in many ways. Being informed, maintaining a healthy respect for women’s own knowledge, using the comprehensive interventional counseling (informative, supportive and therapeutic method) along with yoga and relaxation techniques help those women experiencing infertility and create a better experience for them; Thereby it may help alleviate stress and empower women to undergo treatment with near stress free way.

1.3 Statement of the problem

A study to determine the effectiveness of counseling and yoga on stress and coping among infertile women subjected to IVF treatment in selected hospital, Chennai, South India.
1.4 Objectives of the study

1. Evaluate the effectiveness of counseling and yoga on stress, coping, and pregnancy outcome among infertile women in study group when compared to women in control group.

2. Correlate the stress, coping and performance of yoga with pregnancy outcome.

3. Associate the selected demographic variables with stress, coping, performance of yoga and pregnancy outcome.

1.5 Research Hypotheses

H1. There is a statistically significant difference in the level of stress between infertile women subjected to IVF treatment who participated in counseling than who do not.

H2. There is statistically significant difference in coping abilities between women subjected to IVF treatment who participated in counseling than who do not.

H3. There is statistically significant difference in pregnancy outcome between stress, coping and yoga performance among infertile women who participated in counseling and yoga and those who do not.

H4. There is statistically significant difference in the level of stress and coping between infertile women who participated in yoga and those who do not.

H5. There is statistically relationship between stress and coping among women between study and control groups.

1.6 Operational Definitions

a) Effectiveness: art of estimating the outcome of counseling and yoga on the level of stress and coping. The outcome is compared in terms of level of stress and the ability of women to reduce the unpleasant experience of stress by means of better coping
which was measured on 14th day (posttest 1) and 28th day (posttest 2) of IVF treatment period. Both stress followed by coping ability were assessed by using Fertility Problem Inventory (Newton, 2000) and Coping Check List (Rao et al, 1989) among infertile women in study group and control group. Outcome of counseling and yoga performance of the infertile women in study group is also measured. The outcome of yoga performance is compared with the level of stress and coping ability among infertile women in study group. The obtained stress scores and coping scores of study group women were compared with control group women scores.

b) Counseling: is an interpersonal interaction process by which informative, supportive and therapeutic counseling method were used in two sessions. Where women were helped to expresses their feelings and experiences. They acquired tips to improve their coping abilities to manage stress every day, following healthy practices like food, exercises, coping methods and specific yoga steps recommended for women while they were subjected to IVF treatment. Counseling was given only for infertile women in study group.

The structured counseling intervention containing information counseling given on concepts of infertility, meaning, causes, investigation and treatment procedures and management of infertility on the 1st day of IVF treatment (session 1). This session took about 35 to 40 minutes. The individual approach was followed. Subjects were encouraged to clarify their doubts. On the 2nd day of IVF treatment, Therapeutic counseling was given on effects of stress in general and infertility related stress in particular and the ways of managing stress by healthy coping ability (session 2). The session took about 35 to 40 minutes. The individual approach was followed. Subjects were encouraged to clarify their doubts. On 16th day to 20th day during
hospitalization all women were motivated, encouraged and reinforced to continue the coping style which was discussed earlier. After they were discharged from the hospital on the 21st day of IVF treatment investigator obtained their contact numbers to make sure of their regular practice of coping strategies. Every day, the investigator conversed with all study group women and reinforced them to continue regular practice of coping style and yoga steps.

c) Yoga: is manipulation given only for study group women from 3rd day of IVF treatment up to 28th day of their treatment (session 3). It is a group approach. It includes practice of various body postures and exercise such as (i) Spinal flex (forward and backward movement of the spine) (ii) Titali asana (abduction and adduction of both thighs towards pelvic point), (iii) Pranayama (type of breathing technique), (iv) Meditation (dhyana involves total body scanning, deep breathing, unchanged position, and measures of positive thinking on health maintenance) and (v) Shavasana (This involves supine position with deep relaxation state which enhance physical and mental wellbeing). The group approach was followed. This package was demonstrated for study group infertile women every day until the 12th day. On the 14th day of IVF treatment and 28th day of their treatment, infertile women were asked to do the steps of yoga in front of the investigator and rating score was given by using observational checklist as ‘not done the step’ and ‘done the step’. The ‘not done step’ was reinforced to do correctly; ‘done step’ were motivated and encouraged to continue the same from 16th day to 20th day of IVF treatment reinforcement. This took about 25 to 30 minutes. Infertile women in study group were helped to clarify their doubts. From the 21st day of IVF treatment onwards women were encouraged to do self practice of yoga along with positive coping strategies everyday at home.
d) **Stress:** is an unpleasant experience of women who are unable to conceive spontaneously and seeking technological assistance in reproduction measured by Fertility Problem Inventory. The FPI is a clinician rated scale and include five Domains as Social domain, Sexual domain, Relationship domain, Need for parenthood domain and Child free life domain. The tool contains a total of forty six items rated as 1 to 6, which denote 6 – Strongly Agree, 5 - Moderately Agree, 4 – Slightly Agree, 3 – Slightly Disagree, 2 – Moderately Disagree and 1 – Strongly Disagree. Global stress is calculated by summing all items (or all 5 subscale scores).

The possible score is 276. High score indicates high stress. The level of stress as reaction to infertility was divided into 4 quartiles of the obtained scores as low stress (≤ 220), average (221 to 237), moderate high stress (238 to 249) and very high stress (≥ 250) as suggested by the author of the tool (Newton.2000). The scale is a self rated scale and was used immediately after the intervention and also on the 14th day and on the 28th day of IVF treatment in study group women and in control group women. A total of 10 to 15 minutes was taken to administer the tool.

e) **Coping:** is the ability of infertile women used while facing various kinds of problems during the course of IVF treatment which are used to strengthen their coping abilities and would support them to lead a near stress free life, which was measured by standardized CCL (1989) Coping Check List, a self report tool. CCL includes seven subscales such as Problem solving, Positive Distraction, Negative Distraction, Acceptance, Religious coping, Denial and Local Support. It contains a total of seventy items rated as ‘yes’ or ‘no’ response with the score of 2 for ‘yes’ response and 1 for ‘no’ response. The possible score is 140. The cumulative grading ranges from 0 to 50 denotes occasionally used coping, 51 -75 as sometimes used
coping and 76 to 100 as always used coping. The higher the score; higher the coping.
CCL was used after collecting the data on FPI in both the groups. The scale is a self
rated scale and was used on the 14th day and on the 28th day of IVF treatment in study
group women and in control group women.

f) Women: in both the study and control group were in the age group between 20 and
40 years and had the inability to conceive after a year or more with regular
unprotected intercourse and on the 1st day of IVF treatment.

g) In Vitro Fertilization: included a combination of several steps done over a period
of time approximately 20 – 25 days. First step involved monitoring of the egg,
ripening process and the administration of fertility drugs. Second step is collecting a
considerable quantity of eggs from the ovary and collected eggs are cultured after
inseminating with sperm in Petri dish (36 Hrs) then Transferring of embryo into the
women’s uterus (48 hrs) and waiting for 10 – 14 days. On 28th day, confirm the
pregnancy after 14th day of embryo transfer by serum β- HCG.

1.7 Assumptions

- Women subjected to IVF treatment experience stress in various domains.
- Prolonged period of stressful situation breeds inadequate coping among
  infertile women.
- Counseling may empower infertile women undergo IVF treatment with less
  stress.
- Mind body intervention such as yoga enhances physical and mental health of
  infertile women.
- Counseling cum yoga may bring positive pregnancy outcome.
1.8 Delimitations

- The infertile women who were registered in infertility clinic, G. G. Hospital, taking IVF treatment regularly and planned to continue till confirmation of the pregnancy.

- Few infertile women who did not continue treatment regularly and those who changed the place of taking injection near to their residence.

- Some of the infertile women ended up their treatment incompletely.

- Infertile women those were already exposure to counseling and yoga practice were excluded.