ANXIETY, DEPRESSION, FEMALE SEXUAL DYSFUNCTION IN WOMEN SEEKING INFERTILITY TREATMENT IN TWO MALAYSIAN HOSPITALS

BY

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LIST OF ABBREVIATIONS

WHO: World Health Organization

FSH: Follicle Stimulating Hormone

LH: Luteinizing Hormone

BMI: Body Mass Index

IVF: In-vitro Fertilization

ICSI: Intracytoplasmic Sperm Injection

HADS: Hospital Anxiety and Depression Scale

HIV: Human Immunodeficiency Virus

HUSM: Hospital Univesiti Sains Malaysia

HRPZ II: Hospital Raja Perempuan Zainab II

MVFSFI: Malay Version Female Sexual Function Index

MINI: Mini International Neuropsychiatric Interview

DSM –IV: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition

ICD 10: International Classification Of Disease 10

SPSS: Statistical Package for Social Science

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ABSTRAK

KEBIMBANGAN, KEMURUNGAN DAN DISFUNGSI SEKSUAL WANITA DI KALANGAN WANITA YANG MENDAPATKAN RAWATAN INFERTILITI.

Latarbelakang: Infertiliti atau ketidaksuburan adalah keadaan dimana seseorang itu tidak dapat hamil selepas setahun melakukan hubungan intim tanpa mengamalkan apa-apa kaedah perancang keluarga. Ianya dikaitkan dengan kadar stress yang tinggi. Semakan kajian menunjukkan wanita yang mengalami masalah ketidaksuburan dilaporkan mempunyai kadar kemurungan dan kerisauan yang lebih tinggi berbanding dengan wanita yang subur. Antara kesan lain berkaitan dengan masalah ketidaksuburan di kalangan wanita ialah pertambahan kadar disfungsi seksual. Kajian-kajian terdahulu menunjukkan peningkatan risiko untuk mendapat disfungsi seksual di kalangan wanita yang mengalami masalah ketidaksuburan.

Objektif: Tujuan kajian adalah untuk menentukan prevalen kebimbangan, kemurungan dan disfungsi seksual wanitadi kalangan wanita yang mendapatkan rawatan infertiliti. Kajian ini juga bertujuan untuk melihat kaitan di antara kebimbangan, kemurungan dengan cirri-ciri reproduktif di kalangan wanita yang mendapatkan rawatan infertiliti. Kajian ini juga bertujuan menentukan korelasi di antara kebimbangan dan kemurungan dengan disfungsi seksual wanita di dalam kumpulan wanita tersebut. Di samping itu kajian ini cuba membandingkan perbezaan paras kebimbangan, kemurungan dan disfungsi seksual di antara kumpulan faktor-faktor sosiodemogafi di kalangan wanita yang mendapatkan rawatan infertiliti.

Kaedah: Ini adalah kajian hirisan lintang. Subjek adalah 159 orang wanita yang mendapatkan rawatan infertiliti di klinik infertiliti di Hospital Universiti Sains Malaysia dan Hospital Raja Perempuan Zainab II di Kota Bharu, Kelantan. Kebimbangan dan kemurungan dinilai menggunakan *Hospital Anxiety and Depression scale* versi Melayu (HADS) dan disfungsi

seksual dinilai menggunakan *Female Sexual Function Index* versi Melayu (MVFSFI). Pesakit yang menunjukkan nilai skor yang mencapai takat putus untuk kebimbangan dan kemurungan di dalam HADS telah di temubual menggunakan Mini International Neuropsychiatric Interview (MINI) untuk mengesahkan diagnosis kebimbangan dan kemurungan berdasarkan DSM-IV. Ukuran keputusan adalah peratusan pesakit yang mengalami kebimbangan, kemurungan dan disfungsi seksual wanita, kaitan di antara kebimbangan, kemurungan dengan jenis infertiliti, penyebab infertiliti dan jangkamasa infertiliti. Korelasi di antara kebimbangan, kemurungan dengan disfungsi seksual turut ditentukan. Analisis deskriptif, *Fisher's exact test, Cramer's V test* , *Pearson's Correlation test* dan *Mann-Whitney U test* telah digunakan mengikut kesesuaian di dalam analisa data..

Keputusan: Tiada pesakit yang mencapai takat putus untuk kebimbangan dan kemurungan pada HADS dan telah ditemubual menggunakan MINI yang didiagnos mempunyai kebimbangan dan kemurungan berdasarkan criteria DSM-IV. Walaubagaimana pun, menggunakan borang kajiselidik HADS, 4.4% di dapati mengalami kebimbangan dan 0.6% (1 subjek) mengalami kemurungan. Hanya 3.1% yang mengalami disfungsi seksual wanita yang dikesan menggunakan MVFSFI. Tiada kaitan didapati diantara kebimbangan dan kemurungan dengan jenis infertiliti, sebab infertiliti dan jangkamasa infertiliti. Walaubagaimana pun terdapat korelasi yang signifikan di antara kebimbangan dan kemurungan dengan disfungsi seksual wanita. Tiada perbezaan di antara paras kebimbangan di antara pelbagai faktor sosiodemografi. Walaubagaimanapun terdapat perbezaan di antara paras kebimbangan di antara kumpulan bangsa, tahap pendidikan dan pendapatan yang berlainan. Kajian ini juga mendapati terdapat perbezaan dia antara paras difungsi seksual dengan tempoh perkahwinan yang berbeza.

Kesimpulan: Tahap kebimbangan, kemurungan dan disfungsi seksual adalah rendah di kalangan wanita yang mendapatkan rawatan infertiliti. Tahap kebimbangan dan kemurungan di kalangan mereka tidak menyebabkan ketidakupayaan klinikal. Walaubagaimanapun terdapat korelasi yang signifikan di antara kebimbangan dan kemurungan dengan disfungsi seksual wanita. Tiada perbezaan di antara paras kebimbangan di antara pelbagai faktor sosiodemografi Terdapat perbezaan diantara paras kemurungan di antara bangsa, tahap pendidikan dan pendapatan yang berlainan. Terdapat perbezaan dia antara paras difungsi seksual dengan tempoh perkahwinan yang berbeza.

ABSTRACT

ANXIETY, DEPRESSION AND FEMALE SEXUAL DYSFUNCTION IN WOMEN SEEKING INFERTILITY TREATMENT

Background: Infertility is defined as inability to conceive after 1 year of unprotected sex. It is associated with substantial level of stress. Previous literature has reported that infertility women reported higher level of depressive and anxiety symptoms than women in the fertile population. Another consequence that has been reported in the infertility women is increased level of sexual dysfunction. Studies have reported infertility women at an increased risk of developing sexual dysfunction compared to controls.

Objectives: The aim of the study was to determine the prevalence of anxiety, depression and sexual dysfunction in women seeking infertility treatment. This study also aimed to determine the association between anxiety, depression and reproductive characteristics in women seeking infertility treatment and to determine the correlation between sexual dysfunction and anxiety and depression in women seeking infertility treatment. In addition, this study also compares the level of anxiety, depression and sexual dysfunction between different groups of sociodemographic factors in infertile female patient.

Method: This was a cross sectional study. The subjects consisted of 159 women seeking infertility treatment in infertility clinics in Hospital Universiti Sains Malaysia and Hospital Raja Perempuan Zainab II. They were selected through non probable sampling method. Anxiety and depression was assessed with the Malay version of Hospital Anxiety and Depression Scale (HADS) and sexual dysfunction was assessed by the Malay Version of Female Sexual Function Index (MVFSFI). Patients that scored above the cut off points for depression and anxiety in

HADS questionnaire will be interviewed using Mini International Neuropsychiatric Interview (MINI) to make a diagnosis of Anxiety and/or Depression according to DSM-IV. The outcome measures were the percentages of patient who had anxiety, depression and female sexual dysfunction, the association between anxiety, depression with type of infertility, cause of infertility and duration of infertility. The correlation between anxiety, depression with female sexual dysfunction was determined. Descriptive analysis, Fisher's Exact test, Cramer's V test, Pearson's Correlation test and Mann-Whitney U test were appropriately used in data analysis.

Results: By HADS questionnaire 4.4% was found to have anxiety, 0.6% (1 subject) had depression None of the participants who had reached the cut off point for anxiety and depression of HADS and who were then interviewed using MINI was diagnosed to have any anxiety or depressive disorder according to DSM IV criteria.. Only 3.1% had sexual dysfunction detected by MVFSFI. There were no association found between anxiety and depression with type of infertility, cause of infertility and duration of infertility. However there were significant correlations between anxiety and depression with female sexual dysfunction. There is no significant difference in anxiety level between different groups of socidemographic factors. There are significant difference in depression between different groups of race, education level and income. There is significant difference in sexual dysfunction in different duration of marriage.

Conclusion: The level of anxiety, depression and female sexual dysfunction were low in women seeking infertility treatment. It appeared that the level of anxiety and depression have not led to clinical impairment. However there were significant correlations between anxiety and depression with female sexual dysfunction. There is no significant difference in anxiety level between different groups of socidemographic factors. There are significant difference in

depression between different groups of race, education level and income. There is significant difference in sexual dysfunction in different duration of marriage.

CHAPTER 1

INTRODUCTION

1.1 INFERTILITY

Infertility is defined as inability to conceive after 1 year of unprotected sexual intercourse (Benson RC, 1983). It affects 13% to 15% of couples worldwide (WHO, 2002). Infertility is considered primary if neither partner has achieved a successful pregnancy. Secondary infertility relates to couples who have achieved a pregnancy previously but are having difficulty currently with conception. An estimated 25% of women will experience infertility during their childbearing years.

The causes of infertility include abnormalities of any portion of the male or female reproductive system. A specific cause can be identified in approximately 80% of couples: one third of causes are due to female factors alone, one third to male factors alone, and one third to a combination of problems. "Unexplained" infertility, in which no specific cause is identified, occurs in approximately 20% of infertile couples (Whitman-Elia & Baxley,2001, Speroff, Glass & Kase, 1994).

Several studies have reported different causes of infertility. Some causes are more common in some countries than others, such as pelvic inflammatory diseases (PID) and sexually transmitted infections (STI) in Africa. Some personal habits are considered risk

factors for infertility, such as excess alcohol intake and cigarette smoking (Kamel RM, 2010).

According to the literature survey, the most common causes of infertility are: male factor such as sperm abnormalities, female factor such as ovulation dysfunction and tubal pathology, combined male and female factors and unexplained infertility; where no obvious cause could be detected (Kamel RM, 2010).

1.1.1 Causes of Female Infertility

Mechanical factors account for approximately 40% of identified causes of female infertility. These factors include pelvic adhesions or lesions as a result of pelvic surgeries, infections, or endometriosis that may affect the patency and function of the fallopian tubes and ovarian health. Another 40% of identified causes of female infertility are categorized as ovulatory dysfunction or ovarian failure. Menstrual cycles in normally ovulating women are predictable, occurring at regular intervals with consistent volume and duration. A report of absent or irregular menstrual cycles indicates the woman is anovulatory or oligoovulatory. Significant weight gain can create a physiologic hormonal imbalance, leading to anovulation or irregular menstrual cycles. Extreme weight loss or the competitive female athlete who has about 50% less body fat than a nonathletic woman can also result in amenorrhea and anovulation. Premature ovarian failure (premature menopause) affects approximately 1% of women before the age of 40, and the cause is unknown in most cases (Speroff & Frizz, 2005).

Only 10% of female infertility is considered unexplained with the remaining 10% considered as unusual general health problems such as thyroid disease. The diagnosis of unexplained infertility results when all of the female investigations returns as normal. Poor lifestyle habits are also implicated as risk factors for infertility. Smoking affects the ability of the ovaries to make estrogen, resulting in the oocytes being more prone to genetic abnormalities as well as shortening the woman's reproductive life span.

Research has shown that smoking can result in an earlier onset of menopause by an average of 1.5 years. Substance abuse such as marijuana can interfere with ovulatory function by inhibiting the secretion of gonadotropin-releasing hormone (GnRH). Moderate to heavy alcohol consumption has been associated with lower pregnancy rates (Speroff & Frizz, 2005).

1.1.2 Causes of Male Infertility

Male infertility can be caused by numerous factors and categorized as ductal obstructions or abnormalities of sperm production or sperm function. Obstructions may be partial or complete as a result of vasectomy, sexually transmitted infections, or congenital bilateral absence of the vas deferens. Sperm function abnormalities may be due to problems with sperm binding or penetration of the egg, prostatitis, or varicocele. Varicocele accounts for approximately 40% of male infertility. Sperm production can be affected by endocrine disorders, although these are uncommon. High levels of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) may point to testicular failure, whereas decreased testosterone levels may indicate hypogonadism. Abnormalities of sperm production may also be the result of genetic causes, such as Klinefelter syndrome or Y chromosome

microdeletions, or the result of injury to the testes and infections such as mumps orchitis (Speroff & Frizz, 2005).

As in female counterpart, poor lifestyle habits are also implicated as risk factors for infertility. Tobacco use may increase abnormalities in sperm motility and shape. (Kunzle et al, 2003). Heavy alcohol use lowers hormone levels and sperm quality. Cocaine use can have a direct effect on killing the testis cells and causing lower sperm counts and decreased motility, whereas chronic marijuana use may lower testosterone levels, affecting sperm quality. Use of anabolic steroids lowers the ability of the body to make endogenous testosterone, causing low to zero sperm counts, which may not be reversible. Many medications can have gonadotoxic effects and adversely affect sperm quality. The adverse effect of most drugs is reversible when treatment is ended. Exposure to heat, toxins, and chemicals related to the work environment or hobbies is another concern. Exposure to pesticides, heavy metals, radiation, and cadmium may also interfere with reproductive function (Speroff & Frizz, 2005).

1.1.3 Unexplained infertility

Couples with unknown etiology can be categorized as unexplained infertility or normal infertile couples (NICs), indicating that all findings from standard tests used in the infertility workup are normal. In normal infertile couples, the actual cause for infertility cannot be detected; perhaps there is dysfunctional interaction between the sperm and the oocyte, poor quality of the embryo, or a disruption at the implantation site. In the future,

identifying a mutation or the absence of a specific gene as the cause of infertility may be possible in this patient population.

1.1.4 Infertility investigations

Infertile couples are usually advised to start their investigations after 12 months of trying to conceive or after 6 months if the female partner is more than 35 years old or immediately if there is an obvious cause for their infertility or subfertility (Speroff, Glass, Kase 1999). As the major causes of infertility are sperm abnormalities, ovulation dysfunction, and fallopian tube obstruction, the preliminary adviced investigations for the infertile couple should be focused on semen analysis (to be compared with the WHO reference values (WHO, 1999), detection of ovarian function by hormonal assay (early follicular FSH and LH levels, and mid-luteal progesterone), and evaluation of tubal patency by hysterosalpingography (HSG) (Kamel 2010).

A woman with a suspicion of chronic anovulation most probably due to polycystic ovary (PCO) syndrome, as there is a long history of irregular cycles and clinical presentation with hirsutism, her serum levels of testosterone hormone, sex hormone binding globulin (SHBG), dihydroepiandrostenedione (DHEA), dihydroepiandrostenedione-sulfate (DHEAS) and prolactin should be evaluated to prove the provisional diagnosis and to detect the source of excess androgens.

However, early referral of infertile couples to a dedicated specialist infertility clinic may be indicated to increase their chance of pregnancy. In some cases, the cause of infertility or subfertility could not be suspected from the history taking and clinical

examination. In such circumstances, it is recommended not to prescribe any medication until all basic investigations are done and its results received.

1.1.5 Treatment options

With the fast progression in reproductive medicine and the experiences gained through infertility management, a wider range of treatment options have become available to infertile couples. There are three main types of fertility treatment: medical treatment (such as ovulation induction therapy); surgical treatment (such as laparoscopy and hysteroscopy); and the different assisted reproduction techniques.

In female partner, non-invasive treatment consists of counseling which include advices for having for regular intercourse 2-3 times/week, giving-up smoking, not to drink more than 1-2 units of alcohol/week, not to use any addictive drugs, and follow a supervised weight loss programme if obese (BMI > 29). Folic acid 0.4 mg should be taken as a daily supplement to prevent neural tube defect (5.0 mg adviced for women who have previously affected child or on medication for epilepsy), rubella vaccination in seronegative female patient and treat any psycho-sexual problem if present. Induction of Ovulation is for women with ovulatory dysfunctions to provide a controlled ovarian stimulation. Assisted reproduction techniques such as intra-uterine insemination (IUI) could be used for unexplained infertility and female cases with minimal endometriosis (Kamel, 2010)

Invasive treatments include tubal surgery, hysteroscopic surgery, in-vitro fertilization(IVF) and embryo transfer (ET). Tubal surgery involves laparoscopic

adhesiolysis, tubal cannulation or catheterization. Hysteroscopic surgery is for resection of intrauterine adhesions or polyp. In-vitro Fertilisation (IVF) and Embryo transfer (ET) are used procedure for female tubal factor, moderate male factor, and for unexplained infertile (Kamel, 2010).

In male partner, non-invasive treatment includes counseling as in female partner as well as advice for wearing loose fitting underwear and trousers, and avoid occupational or social situations that might cause testicular heating. Any psycho-sexual problem should be treated if present. Intra-uterine Insemination (IUI) is used for mild male factor infertility problems.

Invasive treatment in male partner may involve surgical restoration of duct patency for cases with previous vasectomy. Intra-cytoplasmic Sperm Injection (ICSI) is commonly used procedure for severe male factor or for recurrent unexplained failed IVF cycles (Kamel 2010).

1.2 Infertility and psychological disorder

For many couples, infertility and its treatment cause serious strains on interpersonal relationships, personal distress, reduced self-esteem, and periods of existential crisis (Greil, 1997). Anderson et al. (2003) conducted a prospective cohort study with a 6-month follow-up measured emotional distress using the Hospital Anxiety and Depression Scale (HADS) on infertility couples. At baseline, 25.7% of women and 8.9% of men had scores of greater than 10 on the Hospital Anxiety and Depression Scale (HADS) Anxiety subscale, and 2.7%

of women and 1.8% of men had scores of greater than 10 on the HADS Depression subscale. At 6-month follow-up the HADS scores were substantially unchanged.

Women who experience infertility report significantly higher levels of depressive symptoms (Domar et al 1992) and anxiety (Downey et al 1989) than women in the fertile population. In one study, 11% of infertile subjects met the criteria for a major depressive episode, compared to 3.6% of fertile subjects (Downey, McKinney 1992). In another study of infertile women, half of the subjects reported changes in their sexual function, and 75% reported changes in mood, such as increased feelings of sadness.

In two studies, it was demonstrated that infertile women have significantly higher levels of depressive symptoms, and twice the prevalence of depressive symptoms relative to fertile women (Cwikel, Gidron & Sheiner 2004, Domar et al. 1992). In a third study that compared infertile and fertile women undergoing routine gynecological care, 11.0% of the infertile women met the criteria for a current major depressive episode, compared with 3.9% for the fertile women (Downey & McKinney, 1992). In another study, infertile women's scores on measures of depression, anxiety, and hostility were significantly higher than the scores among a large normative sample (Wright et al. 1991).When infertile women were compared to women with cancer, hypertension, myocardial infarction, chronic pain, or HIV-positive status, their depression and anxiety scores were indistinguishable from other patients except those with chronic pain (Domar, Zuttermeister & Friedman 1993). Furthermore, in a study using a preferred method for the assessment of distress namely a psychiatric interview, the prevalence of a psychiatric disorder was found to be 40% in 112

infertile women who were interviewed prior to their first infertility clinic visit (Chen et al. 2004). Of these, the most common diagnosis was an anxiety disorder (23%), followed by major depressive disorder (17%). These findings reflect a much higher prevalence of psychiatric disorders in this sample of infertility patients than the
10-12% seen in the primary care setting (Chen et al 2004).

Most carefully designed studies have found that personality measures are unable to distinguish between infertile and non-infertile populations (Greil, 1997). Given the general importance of the relationship between stress and health, it is not unreasonable to suspect that stress may be causally linked to infertility. A study by Domar et al. (1992), of 52 infertile women who participated in a10-week behavioral treatment program including relaxation response training and stress management techniques is of particular interest in this regard. Not only did the women show significant declines in psychological distress after participating in this program, but 16 (32%) of them became pregnant. Boivin and Takefman (1995) on the other hand, measured daily stress levels among 40 women undergoing IVF and discovered that those who did not become pregnant experienced higher stress levels. The distress levels did not emerge until feedback on the prospects of success for a given IVF cycle became available. The authors interpret this as evidence that stress is a consequence rather than a cause of infertility.

Stress associated with infertility is increasingly considered both a determinant and a consequence of reduced fertility (Klonoff et al, 2001). Studies investigating changes in psychoendocrine stress response during in-vitro fertilization have found physiological

alterations associated with stress (Facchinetti et al, 1997). Meller et al, 1997, have found that the depressed women differed significantly from the comparison woman in luteinizing hormone pulse amplitude, rhythmicity and area under the curve thus concluding that major depressive disorder is associated with abnormal regulation of luteinizing hormone. Gonadotrophin regulation may provide a hormonal link between major depressive disorder and impaired fertility. Study by Smeenk et al, 2001, has shown a significant relationship between baseline psychological factors and the probability to become pregnant after in-vitro fertilization(IVF) or intracytoplasmic sperm injection (ICSI) controlling for other factors. State anxiety was found to have stronger correlation with treatment outcome than depression. It was concluded that pre-exisiting psychological factors are independently related to treatment outcome in IVF/ICSI and should therefore be taken into account in patient counseling. Some studies suggest promising result of psychological interventions on pregnancy rate (Sarrel and DeCherney, 1985; Domar et al, 1990).

In a study that utilized an ingenious research design but is marred by the use of a very small sample, Wasser (1993, 1994) compared four groups of women: (1) anatomically infertile women; (2) women with mild anatomic symptoms; (3) those with infertility related to hormonal problems; and (4) women with the same physical conditions as those in group 3 but who were not seeking to achieve pregnancy. The fact that women in groups 3 and 4 displayed higher stress scores leads Wasser to conclude that some types of infertility may be stress-related. Several writers have suggested that the physiological mediator between stress and female fertility may be elevated prolactin levels (Griel, 1997). However, most

contemporary studies assume that infertility is the source, rather than the cause, of psychological distress.

The descriptive literature presents a picture of infertility as a devastating experience, especially for women. For example, Mahlstedt *et al.* (1987), in a study of 63 infertile women and 37 infertile men, found that 96% of their respondents reported feeling frustration, 81% reported feelings of hopelessness, 82% said they were depressed, and 65% reported anger. Among the dominant themes that emerge from the descriptive literature on the infertility experience are:

1. Infertility as a central focus for identity, especially for women.
2. Feelings of loss of control and attempts to regain control.
3. Feelings of defectiveness and reduced competence, especially for women.
4. Statuslessness and ambiguity.
5. Stress on marital and sexual relations at the same time that there exists a counter tendency for infertility to "pull couples together".
6. Feelings of alienation from the "fertile world".
7. A sense of social stigma.
8. Difficulty dealing with infertility at the level of meaning.
9. Immersion in the treatment process.
10. Stressful nature of the treatment process itself.
11. Strained relationships with health care providers.

(Griel, 1997).

Compared with men, women in infertile couples have lower self-esteem, are more depressed, report lower life-satisfaction, are more likely to blame themselves for their infertility, and are more likely to regard childlessness as being unacceptable. Having children was more important to wives than husbands; wives were more involved in trying to have a baby, wanted to talk with their partner more about trying to have a baby, and experienced a greater loss of self-esteem than did their husbands (Pasch, Dunkel-Schetter & Christensen, 2002).

The situation of childlessness is culturally defined. In some Western countries, for example, being childless is acceptable. However, among most non-Western countries childlessness is viewed as reproductive 'failure'. In the Turkish society, infertility has also caused negative social consequences, especially for women (Umran et al, 2010). Local study in Kelantan on the psychosocial impact of female partner in couples with infertility (N. Hazlina NH et al. 2006) showed that 52.2% of responders feel sad with their problem. Majority of responders (83.5%) had psychosocial impact which has association with the level of education.

There is also evidence that depressive symptoms are associated with decreased fertility can interfere with the success of infertility treatment. In one investigation, women with a lifetime history of clinical depression were nearly twice as likely to report infertility as those not depressed (Lapane et al, 1995) . *In vitro* fertilization (IVF) patients who reported heightened levels of depressive symptoms prior to beginning IVF treatment had significantly lower success rates than women with lower levels of depressive symptoms (Thiering et al. 1993, Demyttenaere et al. 1998). In general, infertility-related stress has

been found to have direct and indirect adverse effects on treatment outcomes (Boivin, Schmidt, 2005).

Ramezanzadeh et al. (2004) reported that in infertility female patient, depression had a significant relation with cause of infertility, duration of infertility and educational level, but not with the job of patients. Anxiety had a significant relationship with duration of infertility and job, but not with cause of infertility or patients' educational level. Findings showed that anxiety and depression were most common after 4–6 years of infertility and especially severe depression could be found in those who had infertility for 7–9 years.

1.3 Infertility and Sexual Dysfunction

Female sexual dysfunction is defined as a disturbance in one or more of the processes that characterize the sexual response cycle, or by pain associated with intercourse (DSM-IV). To be designated as dysfunctional, the disturbance must cause significant distress or interpersonal difficulty for the patient. There is no minimum requirement for frequency or range of severity, thus the diagnosis is based on clinical judgment.

Different theories have been constructed to conceptualize the human sexual response. Masters and Johnson (1996), the founders of American human sexuality research and theory, initially posited a linear progression theory. In this theory, both men and women moved through stages of excitement, plateau, orgasm, and resolution. In more recent theories, Basson (2001, 2002, Basson et al. 2003) posits a feedback cycle, which is

reactive to both psychological and biological influences and represents a more accepted status. Indeed, current understanding of sexual desire identifies multiple aspects of function and includes a tapestry of drive, expectations, beliefs, values, and motivation.

There are four general categories for sexual dysfunction (Caroll & Wolpe, 1996):

1. Primary: refers to a sexual problem that has always been present
2. Secondary: refers to a sexual problem that has developed over time and after an individual has had adequate sexual functioning
3. Situational: refers to a sexual problem that only arises during certain situations, e.g. a particular activity or with a different partner
4. Global: refers to a sexual problem that occurs with all situations, sexual activities, and partners.

Phillips (2000) identified four different psychological causes of female sexual dysfunction:

1. Intrapersonal conflicts, which arise from religion, social or cultural influences.
2. Interpersonal conflicts, which involve relationship conflicts and communication problems.
3. Sexual history, which can involve past or current sexual abuse, date rape, or sexual harassment or simple inexperience.
4. Stressors, which can vary from problems of depression to illnesses within the family or financial or job-related problems

Female sexual dysfunction can be categorized into four areas (Caroll & Wolpe, 1996):

1. Hypoactive sexual desire: in which there can be a deficiency of sexual fantasies or thoughts and/or receptivity accompanied by feelings of personal distress, or a phobic aversion to or avoidance of sex.
2. Sexual arousal disorder: in which there is a persistent or recurrent inability to attain or maintain sufficient sexual excitement accompanied by personal distress.
3. Orgasmic disorder: in which attaining orgasm is met with persistent or recurrent difficulty, delay in or absence of response even following sexual stimulation and arousal and is accompanied by personal distress.
4. Sexual pain disorders: the two key areas are dyspareunia, or recurrent genital pain with sexual intercourse, and vaginismus, which involves involuntary spasm of the outer third of the vagina that interferes with penetration and causes personal distress.

Dunn's questionnaire survey of 4000 randomly selected patients in four general practices found that the prevalence of one or more defined sexual dysfunctions was 44% in men and 36% in women. This large cross-sectional study indicated that sexual problems cluster with self-reported physical problems in men, and with psychological and social problems in women (Dunn, Croft & Hackett,1999).

Within the sexological literature, there is very little research on the prevalence of a link between sexual problems and infertility. One such study reported on 514 couples presenting to an andrology unit for assessment of infertility (van Zyl, 1987 a,b). The incidence of

psycho-sexual concerns among males included impaired sexual interest (68.7%), erectile dysfunction (17.1%), and premature ejaculation (13.5%). Female problems included dyspareunia (50%), impaired sexual interest (25.6%), orgasmic dysfunction (21.8%) and a small number of patients complained of apareunia and vaginismus. Van Zyl (1987b) found that inadequate sex education had significantly affected patients' attitudes towards sexual behaviour which, in turn, affected their fertility.

Sexual dysfunction may lead to temporary disruption in marital satisfaction for some couples when there is the need for precise scheduling for the complex demands of fertility treatment. The pressures of needing to have sex at specified times can have considerable negative impact on desire and sexual function (Daniluk, 1997). Sex can become mechanized, diminishing intimacy, compounding the stress the couple is already experiencing (Mahlstedt, 1985). For some couples, the difficulties with intimacy and sexual satisfaction can persist years after they have resolved their infertility (Daniluk, 1997).

Many individuals and couples will report less enjoyment of sexual intimacy as they go through treatment. This may be due to the association of sexual intimacy with failure to get pregnant and, in strictly behavioral terms, individuals and couples get conditioned to associate intimacy with failure rather than pleasure. Add to this the feelings that many women and men express about feeling less feminine or masculine as a result of their infertility hence lowered their sexual enjoyment (Braverman, 2004).

Life stressors, such as those related to medical illness and relationships, are important to address when evaluating a woman with sexual dysfunction. Infertility has been associated with a significant psychosocial impact and, therefore, may be one such stressor. Andrews et al. (1992) demonstrated that, for women, stress related to infertility had a significantly greater impact on their sense of sexual identity than other sources of stress. Millheiser et al. (2010) reported in a case-control study which compared female sexual dysfunction in patient with infertility with a control group. The study showed the patients with infertility had significantly lower scores in the desire and arousal domains and lower frequency of intercourse and masturbation. The patients with infertility retrospectively reported a sex-life satisfaction score that was similar to that of the controls before their diagnosis, whereas their sex-life satisfaction scores after an infertility diagnosis were significantly lower than those of the controls.

1.4 Rationale of the study

The purpose of this study is to assess the frequency of depression, anxiety and sexual dysfunction in women taking infertility treatment. Women take more responsibility than men when it comes to infertility problem. Sexual dysfunction is an important issue to address in these patients since it is an important aspect of individuals or couples' relationship. The problem in sexuality often silent but may put more psychological burden to the already distressed women. This study looked at the correlation between anxiety/depression and female sexual dysfunction to see how the sexual dysfunction and psychological problems are related to each other. The study also looked into the association between reproductive characteristic namely type of infertility, cause of infertility and

duration of infertility with anxiety and depression. The local information in these areas would be useful in the future effort to implement psychological intervention to assist in the treatment of infertility in this part of the world.

CHAPTER 2

OBJECTIVES

2.1 General objective

To determine the frequency of anxiety, depression and sexual dysfunction in women seeking infertility treatment.

2.2 Specific objective

1. To determine the proportion of depression, anxiety and sexual dysfunction in women seeking infertility treatment.

2. To determine the association between anxiety, depression and reproductive characteristics in women seeking infertility treatment.

3. To determine the correlation between sexual dysfunction and anxiety and depression in women seeking infertility treatment

4. To compare the effects of different sociodemographic factors on the level of anxiety, depression and sexual dysfunction.

2.3 HYPOTHESIS

1. There are associations between anxiety, depression and reproductive characterisistics.
2. There are correlations between anxiety, depression and sexual dysfunction.
3. There are differences in the level of anxiety, depression, sexual dysfunction in different groups of sociodemographic factors.

CHAPTER 3

METHODOLOGY

3.1 Research Design

This is a cross sectional study done from early of February 2009 until end of February 2010 at infertility clinic, Hospital Universiti Sains Malaysia (HUSM) and Hospital Raja Perempuan Zainab II (HRPZ II). Patients who were diagnosed as having infertility and fulfilled the inclusion and exclusion criteria were included in the study.

3.2 Site of Study

The study was held at the infertility clinics in Hospital Universiti Sains Malaysia and Hospital Raja Perempuan Zainab II. HUSM is a teaching hospital for undergraduates and postgraduate students for School of Medicine Science, Universiti Sains Malaysia. HRPZ II is a hospital under the Ministry of Health, Malaysia and is a reference center for specialized medical treatment for the state of Kelantan, Malaysia. Infertility clinics in both hospitals are specialized outpatient clinics run by the Department of Obstetrics and Gynaecology of each hospital.

3.3 Study Population

The source population was all women attending infertility clinic in Hospital Universiti Sains Malaysia and Hospital Raja Perempuan Zainab II.

Considering all objectives of the study, the estimated sample size was calculated using single proportion formula to detect prevalence of sexual dysfunction:

$$n = \frac{z^2 p(1-p)}{\Delta^2}$$

$$= \frac{1.96^2 (0.30)(1-0.30)}{0.08^2}$$

$$= 126$$

After considering 10% nonresponder;

$$n = 126 + 13$$

$$= 139$$

n = the required sample size

p = the proportion of sexual dysfunction among Asian women (30% Nicolosi et al. 2005).

In this study, 159 patients were included.

All infertile female patients who fulfilled the inclusion and exclusion criteria were explained about the study. After granting their consent, the patients filled in the general questionnaire, the Malay version of Hospital Anxiety and Depression Scale (HADS) and the Malay Version of Female Sexual Function Index (MVFSFI). Patients that scored above

the cut off points for depression and anxiety in HADS questionnaire will be interviewed using Mini International Neuropsychiatric Interview (M.I.N.I) to make a diagnosis of Anxiety and/or Depression according to DSM-IV. Reproductive characteristic of the patient would be obtained from their clinical records/documentation.

3.4 Details of methodology

3.4.1 Sampling method

Non probable sampling method was applied.

3.4.2 Inclusion criteria

Patient that met the accepted medical definition of infertility.

3.4.3 Exclusion Criteria

a) Patient with other co-morbid chronic medical condition.

b) Patient with other co-morbid psychiatric condition.

3.5 Instruments

3.5.1 General Questionnaire

General questionnaire was designed to obtain data on the demographic characteristics, socio economic status, type of marriage i.e, monogamous or polygamous

marriage, duration of marriage, history of previous pregnancy, history of medical illness in the family, past gynaecological history, history of smoking and substance abuse.

3.5.2 Reproductive Characteristics

Reproductive characteristics are the data that was obtained from patient's clinical records. Reproductive characteristics consist of:

1. Type of infertility: primary or secondary.
2. Cause of infertility:

    a) Male

    b) Female

    c) Combined

    d) Unexplained

3. Duration of infertility documented in years

3.5.3 Hospital Anxiety and Depression Scale (HADS)

Hospital Anxiety and Depression Scale (HADS) is a screening instrument use to assess anxiety and depression. It is a self-administered tool, developed by Zigmond and Snaith (1983). HADS contains 14-item likert scales, seven items for anxiety symptoms and