

**Biopsychosocial Associates of Infertility Related  
Distress and Treatment Outcomes.**

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## **Dedication**

This thesis is dedicated to my mother, Uma Mahajan, whose love and support made me tide over all rough waters and to be where I am today, and to the fond memory of my father, Naresh Mahajan, who opened up my mind to the world and instilled in me the drive to learn, achieve and excel.

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## **Declaration**

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, so to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis being made available for loan and photocopying.

Neha Naresh Mahajan

September 2007

## **Abstract**

The experience of difficulties in conception, the diagnosis of infertility and its treatment are frequently associated with anxiety and overall distress. However, current understanding regarding the determinants of variability in the levels of distress among women undergoing infertility treatment is limited; and the evidence of the significance of distress as a risk factor for assisted conception following IVF/ICSI is inconsistent. The thesis addressed both these issues.

Overall the thesis is informed by the biopsychosocial model of health and illness. Four studies were conducted. The data was collected in three IVF clinics in India. A consecutive sample of 85 infertile women about to commence IVF/ICSI cycle was recruited in the project at cycle baseline and followed through one treatment cycle. The first two studies examined this sample of women at baseline to identify the biopsychosocial factors associated with infertility related distress. The first study examined the degree of cognitive-behavioural adjustment to infertility, its treatment and treatment related eventualities, while the second study focused on the factors associated with affective aspects of infertility related distress such as increase in negativity and decrease in positivity. The third study examined the pattern of change in stress operationalized in terms of changes in Affect and State Anxiety in a sample of 74 infertile women during an IVF/ICSI cycle. The final study developed a prognostic model for evaluating the unique contribution of baseline distress as well as treatment related stress in estimating the odds of pregnancy following IVF based on a consecutive sample of 73 women.

Collectively, the first two studies indicate that at the outset of the IVF/ICSI cycle, some women are more prone to distress than others, and that this variability is associated with their intrapersonal, interpersonal and sociodemographic attributes. These two studies

have identified a set of protective and vulnerability factors related to cognitive-behavioural and affective aspects of distress. The last two studies clearly indicate that the level of distress tends to rise during the treatment among the majority of infertile women. The rising trend continued to be significant even after controlling for variables known to somewhat influence infertility related distress such as age, education, occupation, employment, financial burden and etiological factors. Further, a prognostic model is developed that proposes that both baseline level of stress and treatment stress make a unique contribution in defining the odds of pregnancy outcome for the patients. In short the thesis clearly brings out the case for integrating psychosocial care with the routine medical interventions for infertility.

# Table of Contents

<b>Dedication</b> .....	<b>ii</b>
<b>Acknowledgements</b> .....	<b>iii</b>
<b>Declaration</b> .....	<b>vi</b>
<b>Abstract</b> .....	<b>vii</b>
<b>Table of Contents</b> .....	<b>ix</b>
<b>List of Tables</b> .....	<b>xv</b>
<b>List of Figures</b> .....	<b>xvii</b>
<b>List of Abbreviations</b> .....	<b>xix</b>
<b>List of Appendices</b> .....	<b>xxii</b>
<b>Structure of Thesis</b> .....	<b>xxiii</b>
<b>Chapter 1- Introduction</b> .....	<b>1</b>
1.1 Overview of Infertility .....	2
1.2 Prevalence of Infertility .....	4
1.3 Problems in the measurement of Infertility .....	7
1.4 Psycho-Social context of Infertility .....	11
1.4.1 Self and Infertility .....	11
1.4.2 Gender and Infertility.....	13
1.4.3 Interpersonal Relationships and Infertility .....	14
1.4.4 Social Belief System and Infertility.....	16
1.5 Options for Infertile Couples .....	17
1.5.1 Adoption .....	17
1.5.2 Acceptance of a Childfree Life .....	19
1.5.3 Treatment Options .....	19

<b>Chapter 2 - Psycho-Social Dimensions of Infertility.....</b>	<b>23</b>
2.1 Infertility as a function of psychosocial factors and stress .....	24
2.2 Psychosocial Reactions to Infertility .....	27
2.3 Treatment outcomes as a function of Stress .....	30
<b>Chapter 3 - The Influence Exchange Model: Psychosocial Factors, Infertility and its Treatment Outcomes .....</b>	<b>35</b>
3.1 Purpose.....	35
3.2 Infertility related distress: A Biopsychosocial perspective of disease and illness .....	36
3.3 Resources, distress and IVF outcome: Literature review .....	39
3.4 Rationale of the Thesis .....	53
<b>Chapter 4 – Methodology .....</b>	<b>55</b>
4.1 Design .....	55
4.2 Ethics Clearance .....	56
4.3 Cohort Recruitment Criteria .....	56
4.5 Gaining Consent .....	57
4.6 Sample .....	58
4.7 Data Collection .....	58
4.8 Measures .....	64
4.9 Statistical Analysis.....	68
<b>Chapter 5 - Psychosocial Predictors of Cognitive Behavioural Adjustment to Infertility.....</b>	<b>69</b>
5.1 Introduction.....	70
5.2 Objectives and Hypothesis.....	74
5.3 Materials and Methods.....	76
5.3.1 Participants.....	76

5.3.2	Materials .....	76
5.3.3	Methods .....	77
5.3.4	Statistical Analysis.....	77
5.4	Results.....	81
5.4.1	Biomedical and Socio-demographic characteristics .....	81
5.4.2	Homogeneity of the sample .....	86
5.4.3	Intrapersonal attributes and degree of Adjustment to Infertility.....	87
5.4.4	Interpersonal attributes and degree of Adjustment to infertility.....	90
5.4.5	Biomedical and Socio-demographic characteristics and degree of Adjustment to Infertility .....	92
5.4.6	Mediating role of Interpersonal factors in the relationship between Intrapersonal factors and Adjustment to Infertility .....	94
5.5	Discussion.....	103
5.5.1	Associates of Cognitive-Behavioural Adjustment to Infertility .....	103
5.5.2	Methodological Considerations .....	115
5.6	Conclusion .....	117

<b>Chapter 6 -</b>	<b>Psychosocial Predictors of Positive and Negative Affect before the commencement of an IVF/ICSI cycle.....</b>	<b>118</b>
6.1	Introduction.....	118
6.2	Objectives and Hypothesis.....	121
6.3	Materials and Methods.....	123
6.3.1	Participants.....	123
6.3.2	Materials .....	123
6.3.3	Methods .....	123
6.3.4	Statistical Analysis.....	124
6.4	Results.....	128
6.4.1	Biomedical and Socio-demographic characteristics .....	128
6.4.2	Homogeneity of the sample .....	128

6.4.3	Intrapersonal attributes and Positive Affect.....	131
6.4.4	Intrapersonal Attributes and Negative Affect.....	134
6.4.5	Interpersonal attributes and Positive Affect.....	136
6.4.6	Interpersonal attributes and Negative Affect .....	138
6.4.7	Biomedical and Socio-demographic characteristics and frequency of Positive Affect .....	140
6.4.8	Biomedical and Socio-Demographic Characteristics and frequency of Negative Affect as dependent variable .....	141
6.4.9	Mediating role of Interpersonal factors in the relationship between Intrapersonal factors and Affect .....	143
6.5	Discussion.....	150
6.5.1	Average Affect of the study participants .....	150
6.5.2	Socio-demographic and Biomedical predictors of Affect .....	151
6.5.3	Intrapersonal and Interpersonal predictors of Affect.....	152
6.5.3.1	Intrapersonal and Interpersonal predictors of Positive Affect .....	153
6.5.3.2	Intrapersonal and interpersonal predictors of Negative Affect.....	157
6.6	Conclusion .....	159
<b>Chapter 7 -</b>	<b>Pattern of Changes in Affect and Anxiety across an IVF/ICSI cycle....</b>	<b>161</b>
7.1	Introduction.....	162
7.2	Objectives .....	169
7.3	Material and Methods .....	170
7.3.1	Participants.....	170
7.3.2	Materials .....	170
7.3.3	Methods .....	170
7.3.4	Statistical Analysis.....	171
7.4	Results.....	173
7.4.1	Biomedical and Socio-demographic characteristics .....	173
7.4.2	Affect, State Anxiety and Biomedical factors .....	176

7.4.3	Affect, State anxiety and Socio-demographic factors .....	181
7.4.4	Trends in average Affect and State Anxiety.....	184
7.4.4.1	Changes in Affect and State Anxiety: The effect of stage (T <sub>0</sub> , T <sub>1</sub> & T <sub>2</sub> ) of the treatment .....	185
7.4.4.2	Changes in Affect and State Anxiety over time: The effect of biomedical and socio-demographic factors. ....	186
7.4.4.3	Changes in Positive Affect over time: The effect of biomedical and socio-demographic factors .....	186
7.4.4.4	Changes in Negative Affect over time: The effect of biomedical and socio-demographic factors. ....	190
7.4.4.5	Changes in State Anxiety over time: The effect of biomedical and socio-demographic factors .....	192
7.5	Discussion.....	194
7.6	Implications .....	200

**Chapter 8 - Does treatment stress predict pregnancy outcome? An exploratory**

	<b>investigation.....</b>	<b>201</b>
8.1	Introduction.....	202
8.2	Objectives .....	204
8.3	Material and Methods .....	205
8.3.1	Participants.....	205
8.3.2	Materials .....	205
8.3.3	Methods .....	206
8.3.4	Statistical Analysis.....	207
8.4	Results.....	212
8.4.1	Biomedical and Socio-demographic characteristics .....	212
8.4.2	Preliminary analysis of data.....	215
8.4.3	Predictors of pregnancy outcome .....	215
8.4.4	Baseline Affect and Pregnancy outcome .....	219

8.4.5	Changes in Affect during treatment cycle and Pregnancy outcome.....	219
8.4.6	Shrinkage of the regression coefficients.....	220
8.4.7	Discrimination ability of the developed model.....	222
8.4.8	Affect, treatment progress, and pregnancy outcome .....	222
8.5	Discussion.....	226
8.5.1	Predictors of pregnancy outcome. ....	227
8.5.1.1	Baseline Positive Affect and the odds of pregnancy. ....	227
8.5.1.2	Change in stress during treatment at time-1 (OPU) i.e. $\Delta NA_{1-0}$ and $\Delta PA_{1-0}$ and the odds of pregnancy. ....	232
8.5.1.3	Treatment stress at time 2 (ET), i.e. $\Delta NA_{2-0}$ and the odds of pregnancy.....	234
8.5.2	Methodological Consideration:.....	237
8.6	Implications .....	240
<b>Chapter 9 - Contributions of the Thesis .....</b>		<b>241</b>
<b>References .....</b>		<b>246</b>
<b>Appendix 1</b>	<b>Patient Information Sheet.....</b>	<b>291</b>
<b>Appendix 2</b>	<b>Participant Consent Form.....</b>	<b>293</b>
<b>Appendix 3</b>	<b>Participant Complaint Form .....</b>	<b>294</b>
<b>Appendix 4</b>	<b>Socio Demographic Sheet.....</b>	<b>295</b>
<b>Appendix 5</b>	<b>Glossary .....</b>	<b>299</b>

## List of Tables

Table 4. 1:	Description of Questionnaire Sets .....	59
Table 5. 1:	Biomedical characteristics of the study population .....	81
Table 5. 2:	Socio-demographic characteristics of the study population .....	84
Table 5. 3:	Subgroup differences in Fertility Adjustment .....	86
Table 5. 4:	Summary of Hierarchical Linear Regression analyses of intrapersonal variables predicting the extent of Adjustment to Infertility.....	88
Table 5. 5:	Summary of Hierarchical Linear Regression analyses of interpersonal variables predicting the extent of Adjustment to Infertility.....	91
Table 5. 6:	Summary of Regression Analysis on Socio-Demographic and Biomedical variables with Fertility Adjustment as dependent variable. ...	93
Table 6.1:	Subgroup differences in mean scores of Positive Affect (PA) .....	129
Table 6. 2:	Subgroup differences in mean scores of Negative Affect .....	130
Table 6. 3:	Summary of Hierarchical Linear Regression analyses of intrapersonal variables predicting the extent of Positive Affect.....	132
Table 6. 4:	Summary of Hierarchical Linear Regression analyses of intrapersonal variables predicting the extent of Negative Affect .....	135
Table 6. 5:	Summary of Hierarchical Linear Regression analyses on interpersonal variables predicting the extent of Positive Affect.....	137
Table 6. 6:	Summary of Hierarchical Linear Regression analyses of interpersonal variables predicting the extent of Negative Affect .....	139
Table 6. 7:	Summary of Regression analysis of Socio-demographic and Biomedical variables with Positive Affect as dependent variable.....	141

Table 6. 8:	Summary of Regression analysis of Socio-demographic and Biomedical variables with Negative Affect as dependent variable .....	142
Table 7. 1:	Previous studies that examined the change in emotions during an IVF/ICSI cycle.....	166
Table 7. 2:	Biomedical characteristics of the study population .....	174
Table 7. 3:	Socio-demographic characteristics of the study population .....	175
Table 7. 4:	Difference in mean Affect and State Anxiety across Biomedical sub-groups at various time points .....	177
Table 7. 5:	Difference in mean Affect and State Anxiety across Socio-demographic sub-groups at three different time points. ....	182
Table 7. 6:	Effect of time, time × age, time × duration of marriage, time × type of infertility and time × financial burden of treatment on Positive Affect (PA).....	187
Table 7. 7:	Effect of time, time × age, time × financial burden of treatment on Negative Affect (NA) .....	190
Table 7. 8:	Effect of time, time × level of financial burden of treatment on State Anxiety (St ANX).....	192
Table 8. 1:	Biomedical characteristics of the study population .....	213
Table 8. 2:	Socio-demographic characteristics of the study population .....	214
Table 8. 3:	Summary of Stepwise Regression and Goodness of Fit at each step .....	216
Table 8. 4:	Summary of Best 4 & 5 Predictor Models with $\chi^2 > 15$ .....	217
Table 8. 5:	Summary of the prognostic model that best predicts pregnancy .....	218
Table 8. 6:	Shrunken estimates and the odds ratio for the predictors in the best subset model .....	220

## List of Figures

Figure 3.1	Relationship between Disease and Illness in Case of Infertility.....	38
Figure 3.2	Diagrammatic Illustration of the Model .....	41
Figure 4.1	Diagrammatic representation of procedures .....	60
Figure 5.1	Summary of Regression equations testing mediated relations between Avoidance type of Adult Attachment Style and Adjustment to Infertility.....	95
Figure 5. 2	Summary of Regression equations testing mediated relations Intrinsic Religiosity (I- Religiosity) and Adjustment to Infertility .....	98
Figure 5. 3	Summary of Regression equations testing mediated relations between Meaning of Parenthood 2 and Adjustment to Infertility.....	100
Figure 6.1	Summary of Regression equations testing mediated relations between Intrinsic Religiosity (I- Religiosity) and Positive Affect .....	144
Figure 6.2	Summary of Regression equations testing mediated relations between Meaning of Parenthood 1 and Positive Affect.....	147
Figure 6.3	Summary of Regression analysis testing mediated relations between Perceived Internal Control and Positive Affect. ....	148
Figure 7.1	Changes in Affect and State Anxiety within an IVF/ICSI cycle .....	186
Figure 7.2	Changes in Positive Affect (PA) over time and the effect of female age, duration of marriage, type of infertility and financial burden of treatment.....	188

Figure 7.3	Changes in Negative Affect (NA) over time and the effect of female age and financial burden of treatment.....	191
Figure 7.4	Changes in State Anxiety (St ANX) over time and the effect of financial burden of treatment.....	193
Figure 8.1	Mediation model of effect of baseline Positive Affect ( $PA_0$ ) on pregnancy after adjusting for the affect of $PA_{1-0}$ , $NA_{1-0}$ and $NA_{2-0}$ .....	223
Figure 8.2	Mediation model of effect of change in Positive Affect ( $PA_{1-0}$ ) at OPU on pregnancy after adjusting for the affect of $PA_0$ , $NA_{1-0}$ and $NA_{2-0}$ .....	223
Figure 8.3	Mediation model of effect of change in Negative Affect ( $NA_{1-0}$ ) at OPU on pregnancy after adjusting for the affect of $PA_0$ , $PA_{1-0}$ and $NA_{2-0}$ ....	224
Figure 8.4	Plausible mechanisms for the observed relationship between baseline Positive Affect ( $PA_0$ ) and pregnancy outcomes .....	230

## List of Abbreviations

AAS	Adult Attachment Style
AI	Artificial Insemination
AIDS	Acquired Immuno Deficiency Syndrome
ART	Assisted Reproductive Technology
ASRM	American Society of Reproductive Medicine
CBT	Cognitive Behavior Therapy
D.I	Dependent Variable
DI	Donor Insemination (using donor sperm)
DV	Dependant Variable
ET	Embryo Transfer (putting fertilized eggs back inside the uterus)
FSH	Follicle Stimulating Hormone (pregnancy indicating hormone that makes pregnancy tests register)
GIFT	Gamete Intrafallopian Transfer (fertilized egg is put in the tubes to travel to the uterus)
GnRH	Gonadotrophin Releasing Hormone
HIV	Human Immuno Virus
I- Religiosity	Intrinsic Religiosity
I.V	Independent Variable
ICSI	Intra-Cytoplasmic Sperm Injection (inject sperm directly in the egg)
IUI	Intrauterine Insemination (sperm is taken out of male and inserted into the female using a clinical device)
IV	Independent Variable

IVF	In-Vitro Fertilization (Eggs, usually with hyper stimulation, and sperm are removed from the female and male, put together in the lab, incubated, and then returned to the female)
M1	Mediator 1 (First mediator variable of the effect of an independent variable on the dependent variable)
M2	Mediator 2 (Second mediator variable of the effect of an independent variable on the dependent variable)
MOP-1	Meaning of Parenthood 1 (perception of children as natural expectation for the adults)
MOP-2	Meaning of Parenthood 2 (perception of children as natural expectation from marriage and necessary for its completion)
MOP-3	Meaning of Parenthood 3 (perception of children as necessary for sex role confirmation)
NA	Negative Affect
NK- CD56+	Natural Killer Cells
N-Preg.	Non-pregnant
OPU	Ovum Pick Up (surgical removal of eggs/ovum from the ovaries)
PA	Positive Affect
P-I-control	Perceived Internal Control
Preg.	Pregnant
SS-Fam	Social Support from Family
SS-FRI	Social Support from Friends
SS-SO	Social Support from Significant Others
St ANX	State Anxiety
STD	Sexually Transmitted Disease

T-ANX      Trait Anxiety

ZIFT      Zygote Intra Fallopian Transfer (fertilized embryo is placed in the tubes  
to travel and implant in the uterus)

## **List of Appendices**

Appendix 1	Patient Information Sheet
Appendix 2	Patient Consent Form
Appendix 3	Complaint Form
Appendix 4	Socio-demographic Sheet
Appendix 5	Glossary of terms

## **Structure of Thesis**

The large body of scholarship suggests that there is considerable distress and disruption associated with the event of infertility. Besides it suggests the inhibitory role of distress in natural and medically assisted conception. Most of our understanding in the field is based on studies conducted in Western and European settings. Relatively very few studies in this area have been done in non western settings especially India, notwithstanding that currently there are approximately 15-20 million infertile women in India alone and also that assisted reproductive technologies are rapidly gaining popularity.

Due to the emphasis of the Indian government on population control the voice of these women is neither visible in social research, nor in the mental health research, nor in the public health system. However, such women are conspicuous in their families and the society at large given that at least one child after marriage is a cultural norm.

This suggests the need to understand, how infertile Indian women manage their distress and disruption. Though social and technological changes are markedly evident in the country, some areas of life are not very different from what they were before. Cultural ideology and practices with regards to marriage, family and childbearing have not reflected a substantial change. These still remain predominantly influenced by the religious faith and practices. Most of the religions (e.g. Hinduism, Sikhism, Islam and Christianity) consider motherhood as a sacred duty of married women. Thus the socio-cultural norms mandate childbearing after few years of marriage (usually two years).

Thus the present thesis aim to identify biopsychosocial factors associated with infertility related distress among Indian women who are due to commence infertility treatment i.e.

an IVF/ICSI cycle, and further to understand the pattern of change in stress across the various stages of one treatment cycle, and to evaluate the role of stress in defining the odds of pregnancy following one IVF cycle. The thesis is an attempt to reduce the gap in the current research, knowledge and understanding to inform the clinical practice and health policy.

The thesis is structured into nine chapters. The outline and function of each chapter is described below:

### **Chapter 1: Introduction**

This chapter is structured into two parts. The first part provides the overall background and introduces the concept of infertility, its definitions, types and epidemiology. Besides, the chapter discusses the private harm resulting from infertility and role of religious beliefs, societal attitudes and culture in determining the nature and extent of distress experienced by infertile couples.

The second part of this chapter looks into the different problem solving actions that the infertile couples usually take. Such couples may decide to adopt a child or accept a childfree lifestyle or undergo treatment in an attempt to resolve their infertility crisis.

### **Chapter 2: Psychosocial dimensions of Infertility**

This chapter presents the historical development of trends in infertility research. The chapter is sectioned into three parts. The first section reviews the classical psychogenic model of infertility that evolved between 1940s and 1960s. This model emphasized the functional role of psychological conflicts and pathologies in the etiology of infertility. Both the emergence as well as the decline in the popularity of the classical model is discussed.

The second section reviews research that identifies infertility as a major life crisis and explores the nature as well as the role of infertility in causing distress and psychopathologies. The emergence of this hypothesis during early 1970s to late 1980's over-lapped with the decline of the classical psychogenic model.

The third section of the chapter reviews and summarizes the literature on the influence of psychosocial variables on treatment outcomes. This line of research is becoming more and more popular with rapid advancements in reproductive endocrinology, diagnostic instruments and assisted reproductive techniques. This represents the most recent line of research.

### **Chapter 3: Influence Exchange Model: Psychosocial Stress and Infertility treatment outcome.**

This chapter exclusively focuses on the infertile couples undergoing treatment and attempts to integrate the findings of previous research that investigated a link between psychosocial stress and outcomes of infertility treatment (primarily IVF/ICSI).

The first section brings out the Biopsychosocial nature of infertility and the psychological morbidity associated with infertility. Further it recommends the application of the biopsychosocial model in infertility care.

In the later section, an integrative model is developed that underscores the psychosocial factors, more particularly, the intrapersonal, interpersonal, lifestyle and socio-demographic factors that influence the dimensions of the experience of infertility related stress as well as its treatment and vice versa. The model also illustrates the way stress manifests at the behavioural, psychological and physiological level and the mechanism by which it can influence the treatment outcomes.

In the last section, the rationale and the broad aim of the current thesis is lineated.

## **Chapter 4: Methodology**

This chapter provides the detailed methodology used in the thesis. The clinical setting in which the research was done, how the patients were recruited, how the data was collected and the instruments used for data collection have been described in detail.

## **Chapter 5 & 6: Study 1 and study 2**

The next two chapters constitute the first two studies of the thesis. Both studies have investigated the association of biopsychosocial factors with infertility related distress. While the first study focuses on the cognitive dimensions of infertility related distress among women undertaking IVF/ICSI, particularly the degree of cognitive behavioural adjustment to infertility and its treatment related eventualities, the second focuses on affective dimensions of infertility related stress. Both studies are complete in themselves and presented in chapter five and six respectively.

## **Chapter 7: Study 3**

This chapter presents the third study of the thesis. The third study focused on identifying the pattern of changes in both positive and negative affect as well as the changes in state anxiety as the patients progress in their infertility treatment through IVF/ICSI. The assessments were done at two important stages of the treatment, i.e. before egg retrieval also known as ovum pick-up (OPU) stage and before embryo transfer (ET) stage.

## **Chapter 8: Study 4**

Chapter 8 presents the fourth and final study of this thesis. This study explores the unique role of treatment stress (change in stress during treatment) in defining the odds of pregnancy. Further, the study tests the role of treatment factors such as quality of

oocytes, embryos and the number of embryos transferred in explaining the phenomenon responsible for the impact of treatment stress on the odds of pregnancy outcome.

## **Chapter 9: Contributions of the Thesis**

This chapter briefly summarizes the four studies undertaken in this thesis and highlights the important findings, the implications of the thesis for health care professionals involved in infertility care and public policy and new research agendas that have emerged from the studies undertaken in this thesis.