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Coping and Resilience among Women Undergoing Assisted Reproductive Therapies

Section A: Psychological adjustment and coping among women going through In Vitro Fertilisation treatment: A systematic review

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Summary of the MRP Portfolio

The focus of this Major Research Project is coping, psychological adaptation and resilience of women experiencing fertility difficulties.

Section A: This section provides a systematic review of the empirical literature focusing on coping and psychological adaptation of women undergoing In Vitro Fertilisation. Positive adjustment was found to be associated with affectionate relationships, familial support, intrinsic religiosity, wider life goals, dispositional optimism, and coping strategies which help women approach and appraise their source of distress. Poor adjustment was associated with avoidance and escape based strategies, the need to avoid social pressure, poor relationships, poor self-esteem, high neuroticism and introversion. Further research is needed to understand the process through which women overcome the adversity of repeated failed conception attempts in the context of assisted reproductive therapies.

Section B: This study aimed to develop a theoretical model of resilience among women experiencing repeated unsuccessful conception attempts. Eleven women undergoing treatment for their fertility difficulties were interviewed about their experiences of living through unsuccessful conception attempts. Transcribed interviews were analysed using Grounded Theory. Resilience was demonstrated by the participants' ability to take steps to build their resources (emotional and practical) in preparation for next treatment attempts or by stepping away from treatment when their resources have been depleted. A model was developed demonstrating the relationship between the identified categories.

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Section A

Psychological adjustment and coping among women going through In Vitro Fertilisation treatment: A systematic review

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Abstract

The experience of struggling to conceive a child is highly distressing for both men and women. However, women often report greater anxiety and depression. Their distress is further exacerbated by invasive infertility treatments such as IVF. Therefore, there is a need for a greater understanding of how women cope with this stressor. The aim of this paper was to systematically review literature focusing on coping and psychological adjustment of women undergoing IVF. The evidence suggests that strategies which help women approach and appraise their source of distress lead to positive adjustment. Affectionate relationships with the partner, familial support, intrinsic religiosity, wider life goals, and dispositional optimism were found to be associated with better mental health outcomes. On the other hand, avoidance and escape based strategies had detrimental effects on women's mental health. Women experienced greater distress if they were driven to conceive in order to avoid social pressure, had poor relationships, poor self-esteem and scored highly on measures of neuroticism and introversion. Further research is needed to gain an understanding of how women adapt to the adversity of infertility treatment and what enables them to continue to attempt pregnancy through assisted reproductive methods.

Key words: IVF; coping; psychological adjustment; systematic review; women

1 Introduction

1.1 Infertility and In Vitro Fertilisation

There is a cross cultural consistency in the human desire for procreation (Uribelarrea, 2008). Yet, one in seven couples in the UK will experience difficulties with conception (HFEA, 2013). According to the National Institute for Health and Care Excellence, couples who have not been successful in achieving pregnancy after a year should be offered further clinical investigations of their fertility. Couples who have medically unexplained infertility, have not conceived within 2 years, or have had 12 cycles of artificial insemination are referred for an In Vitro Fertilisation (IVF) treatment (NICE, 2013).

IVF is an invasive treatment which involves several stages, starting with the suppression of the woman's natural hormone cycle. This is followed by women self-administering hormones to stimulate the production of eggs, which are then collected and fertilised. Fertilised eggs are observed and monitored for their development for up to six days. A maximum of two embryos can be transferred at a time to reduce the chances of multiple pregnancies (HFEA, 2013).

IVF success rates vary significantly depending on the woman's age, with the highest being among those between 18 and 34 years. According to the HFEA (2013) women in this age group have a 32.8% success rate of a live birth. Such rates drop significantly for higher age groups. For example, women between the ages of 40 to 42 years have only 12.4% success rate of a live birth. This decreases down to 4.4% for women over the age of 43 years. Despite these low success rates, there has been a gradual increase in the number of women relying on IVF to help them achieve pregnancy (HFEA, 2013).

1.2 Emotional impact of infertility and IVF treatment

A vast amount of literature has focused on exploring the emotional impact of infertility. A large scale review by Greil (1997) revealed that research focusing on distress and self-esteem found a significant difference between individuals with and without fertility problems. Infertile couples reported higher levels of anxiety and depression than those without fertility problems. Fertility specific distress was found to predict emotional and marital distress (Gana & Jakubowska, 2014).

Although infertility is a stressful event for both men and women, there are significant differences in how males and females are impacted by infertility (Greil, 1997). In comparison to men, women were found to have lower self-esteem, life satisfaction, and higher levels of depression and anxiety (Greil, 1997; Schaller et al., 2016). Women undergoing IVF often report feelings of isolation and anger, and evaluate infertility as the most upsetting aspect of their lives (Cousineau & Domar, 2007). According to Domar, Zuttermeister and Friedman (1993) the psychological profile of women with infertility is comparable to individuals with other serious medical conditions such as cancer and cardiac difficulties.

In addition to coping with infertility, many individuals need to cope with the stressors of infertility treatment. For women, these often involve the administration of fertility drugs which impact on their hormone levels, mood and physical health. As the treatment progresses, women may be asked to undertake invasive procedures, which can cause physical discomfort or pain (Cousineau & Domar, 2007). Cousineau and Domar (2007) argue that although treatment can be physically demanding, women often report more psychological than physical distress. It has been found that women going through IVF report higher levels of distress than those offered less invasive treatments. This suggests that the stress associated with infertility treatment is cumulative and that women undergoing IVF may be most at risk of poor mental health (Cousineau & Domar, 2007).

A systematic review of women's emotional responses across IVF treatment concluded that women experience highest level of distress between the oocyte (egg) retrieval and pregnancy testing stage of treatment (Verhaak et al., 2007). This distress appears to decrease almost immediately after getting the IVF result, which suggests that psychological distress during IVF is in large part determined by the threat of treatment failure. However, even though most women adjust to the difficulties of unsuccessful treatments a considerable number of women develop clinically significant emotional problems (Verhaak et al., 2007). Studies focusing on longer term effects of unsuccessful treatment suggest that there is no overall recovery from increased anxiety and depression even several months after the end of last treatment (Verhaak, Smeenk, van Minnen, Kremer, & Kraaimaat, 2005). With the increasing evidence base pointing to the psychological demands of infertility treatment, there is a need for more understanding of women's ability to cope with and adjust to this stressor.

1.3 Theoretical perspective

The research within the field of infertility treatment, has focused on investigating the impact of coping strategies and protective factors on psychological adjustment. As such, the current evidence base is considered within the framework of coping and identity theories.

1.3.1 Coping theory- Folkman and Lazarus (1988)

Much of the infertility literature focusing on coping and adaption is based on the coping theory proposed by Folkman and Lazarus (1988). According to this theory, individuals broadly rely on 8 coping behaviours divided into problem focused strategies (altering the situation which is causing distress) and emotion focused strategies (regulating distress) (Appendix A). Folkman and Lazarus (1988) argue that coping strategies mediate the emotional response through several pathways. These are the deployment of attention, changing the meaning of the situation, or changing the actual terms of the situation.

Through the "deployment of attention" pathway, individuals use coping strategies to divert their attention away from the source of their distress (escape-avoidance) or towards the distress (vigilance). For example, a woman may avoid her pregnant friends and reminders of infertility in an effort to escape her distress. On the other hand, she may be vigilantly monitoring her physical health (Peterson, Newton, Rosen, & Skaggs, 2006). Escape-avoidant strategies are seen to offer brief respite from distress, but can lead to prolonged symptoms of anxiety and depression. On the other hand, vigilance alters emotional response by leading to plans of action to change the situation or the cognitions associated with the distress (Folkman & Lazarus, 1988).

Through the use of denial or distancing strategies, the person attempts to change the meaning of the situation by distorting the reality or detaching from the source of the distress. In this case a woman may be seen to make light of her infertility (Peterson et al., 2006). A person may also attempt to change the actual source of their distress. This is usually done through problem focused strategies or confronting the source of the distress. A woman relying on this strategy may be drawn to finding a solution to the infertility (Peterson et al., 2006).

Folkman and Lazarus (1988) acknowledge that the process of coping is highly complex. A number of emotions can be elicited by one or multiple sources of distress. As such, coping can be variable across a situation, and individuals may employ more than one strategy to attempt to deal with the distress they are experiencing.

1.3.2 Theory of Self Complexity- Linville (1985)

The Theory of Self Complexity suggests that individuals perceive themselves as consisting of multiple identities. According to Linville (1985) this view serves as a buffer against adversity. When an individual faces a negative event that corresponds to an aspect of

their identity it threatens their personal sense of self and wellbeing. A woman who fails to achieve pregnancy may experience infertility as a threat to her female identity or an envisaged identity of a parent. This in turn may negatively impact on her sense of self and wellbeing. Linville (1985) argues that individuals with less complex identities are more likely to be negatively impacted by adverse events. On the other hand, appraisal of other self-aspects moderates the emotional response to negative events.

1.4 Summary of previous reviews

To date four reviews have been published on the topic of coping and psychological adaptation among infertile individuals. These reviews focus on gender differences in coping, coping among couples going through treatment and psychosocial protective factors in women going through IVF.

Jordan and Revenson (1999) conducted a meta-analysis of eight studies looking at gender difference in coping with infertility difficulties. There was a significant difference between men and women in the use of escape-avoidance, seeking social support, positive reappraisal and planful problem-solving strategies. Women were found to rely on these strategies to a greater extent than men. The authors suggested that this characterises gender differences in the socialisation process, where women may be more likely to seek social contact as a way of processing their difficult emotions.

In contrast, Ying, Wu and Loke (2015) provided a broad review of 33 papers looking at gender differences within infertility and coping. Females were found to have lower self-esteem, physical health, impaired sense of identity, higher levels of stigma, depression, stress and anxiety (Ying et al., 2015). Similarly to Jordan and Revenson (1999) this review concluded that women tend to engage in avoidant coping strategies, seeking of emotional support, and cognitive restructuring strategies more frequently than men.

In their review of infertile individuals, Deltsidou and Lykeridou (2007) found that people with high socio-economic status applied more active problem-solving ways of coping and fewer avoidant strategies. Similarly to Jordan and Revenson (1999), the authors of this review conclude that women used escape and avoidant coping strategies, and engaged in positive reappraisal more frequently than men.

Looking at women specifically Rockliff et al. (2014) reviewed 25 studies assessing the impact of a range of psychosocial factors on adaptation of those going through IVF. It was found that neuroticism, self-criticism and dependency were positively associated with distress. In line with previous reviews, escapist coping strategies were also found to increase distress. The authors conclude that social support reduced distress among women going through IVF, which contrasts the conclusions made by Ying et al. (2015).

Gender differences in coping have been found to manifest in many contexts, such as family, relationship and health difficulties (Matud, 2004). The conclusions of these reviews suggest that such differences uphold also within the context of infertility. Women tend to report greater distress than men when it comes to infertility and mainly use social seeking or avoidance based strategies. As such there is a need for greater understanding of coping among women alone. Although (Rockliff et al., 2014) aimed to do this, the scope of their review was very broad. The authors included studies focusing on both women at the beginning of their treatment as well as those coping with parenting stress following a successful IVF. Women having conceived through assisted reproductive therapy face different stressors such as low maternal self-efficacy (Hammarberg, Fisher & Wynter, 2008). Therefore, it can be argued that a synthesis of such studies can lead to misleading conclusions. Further, all of the reviews included papers where participants were often couples. Such studies have been criticised for treating participant variables as independent, without acknowledging the interconnected nature of coping among couples (Rockliff et al.,

2014). Therefore, it remains unclear how women specifically attempt to cope and adjust to treatment related stress.

1.5 Aim of current review

This paper aims to review the literature focusing on coping, adjustment and resilience among women going through IVF. Studies which focus on both coping and the emotional aspects of IVF are included. However, given the limited space, findings related only to the emotional impact and distress associated with treatment will not be discussed as part of this review. Such information will be discussed only with regards to coping and psychological adaptation.

1.6 Method

1.6.1 Type of review and quality appraisal

This paper provides a systematic search and review of the research (Grant & Booth, 2009). Such review aims to provide a comprehensive and methodological search of literature and incorporates multiple study types.

Quality of the presented literature is evaluated according to the Mixed Methods Appraisal Tool (MMAT) (Pluye et al., 2011) (Appendix B). The MMAT has been developed to appraise the methodological quality of mixed method study reviews. The MMAT has been found to have a moderate to perfect interrater reliability in comparing the quality of methodologically different studies (Pace et al., 2012). A maximum score of 4 is assigned to studies of the highest quality.

1.6.2 Search terms

Terminology with regards to infertility and infertility treatment was based on the information provided by the HFEA (2013). Terms relating to coping and psychological

adaptation were consulted with the research supervisors. The database suggestions regarding related terms were also included in the search process.

1.6.3 Search strategy

An electronic search of the following databases was carried out: Cochrane Database of Systematic Reviews, CINAHL, ASSIA, Web of Science, Maternity and Infant Care, Medline and PsycINFO. Google Scholar was used to search for articles not generated by the database search. The search was carried out between June 2015 and September 2015. The last search of the literature (to identify any new papers not found in the initial systematic search) was carried out in January 2016.

Table 1 depicts the search terms used within the systematic literature search. Boolean operators were used to combine the search terms. Search terms were truncated where appropriate (e.g. adapt*= adaptation, adaptive, adapting). Literature was searched from the year 1978, which marks the first IVF birth (HFEA, 2009).

Table 1

Search Terms Used in the Systematic Literature Search

Infertility		**Assisted Reproductive Therapy**		**Coping and adaptation**
Infertility Subfertility Fertility difficulties Childlessness	AND	IVF In Vitro Fertilisation Embryo transfer Assisted reproductive techniques Assisted reproductive therapy Fertility treatment	AND	Coping Adaptation Resilience Psychological adjustment Psychological endurance

Articles were initially excluded if their titles did not refer to women, infertility and coping or psychological adjustment. The abstracts of the remaining articles were reviewed and excluded if they did not meet any of the inclusion and exclusion criteria (Table 2).

Finally, full text articles were reviewed and included if all inclusion and exclusion criteria applied. The reference lists of full text articles were hand searched. This literature search generated 25 studies. The process of the systematic search is depicted in Figure 1.

Table 2

Literature Search Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
Study focuses on female participants only OR data of female participants is analysed separately to those of male participants	Study focuses on couples
Data of female participants is not compared to the data of male participants	Study is not clear whether participants were going through IVF
Data of participants going through treatment other than IVF is analysed separately	Study investigated predictors of IVF outcome or success
Participants must be going through IVF (ICSI participants included as well as procedure differs only in terms of the fertilisation process)	Study focuses on IVF children, attachment, parenting
Study must focus on psychological coping, adjustment, resilience or adaptation	Study does not meet the inclusion criteria
Study must be published in English	Dissertations and personal accounts

1.6.4 Structure of this review

This review is structured according to the topics examined by the research papers. As some studies have focused on more than one area, they may be reviewed under different sections of the review. An overall critique of the quality of the literature will be provided at the end of the review, followed by a consideration of the clinical and research implications. Due to the constraints of this review, only papers which expand on or contradict earlier findings are discussed in more detail.

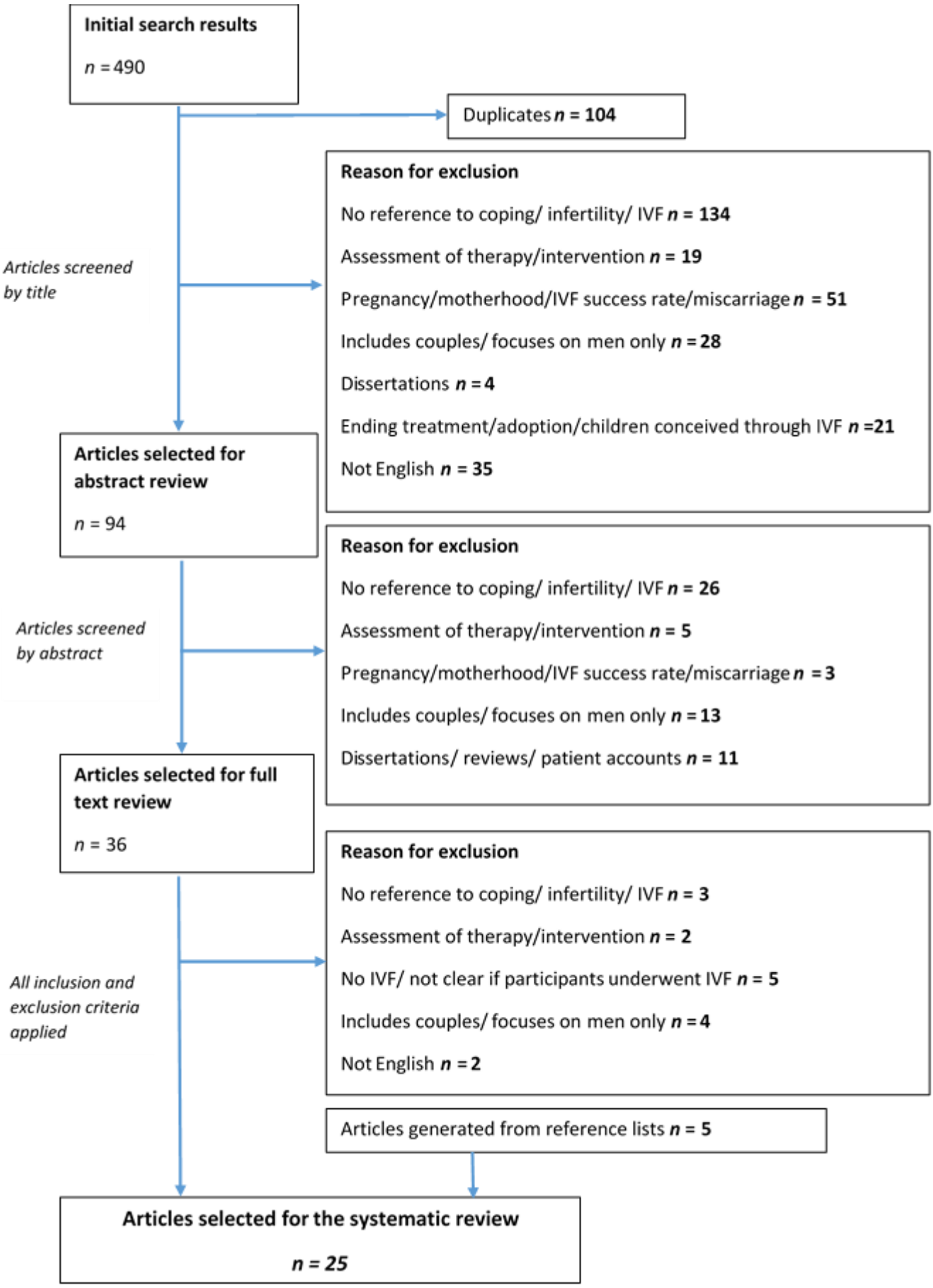

Figure 1. Systematic literature search flow chart

2 Results

2.1 Summary of papers

Of the 25 papers reviewed, one had a qualitative design, one had a mixed methods design and one had a randomized control design. Eight studies were longitudinal and 11 were cross-sectional. Three studies had a descriptive design. The papers were conducted across Europe, Asia, America and Australia. Only one study was conducted in the UK. Sample sizes varied, with the lowest being 37 and the highest 631 participants. A full summary of each paper is included in Table 3.

Table 3

Summary of Research Articles[1]

Section of the review	Authors & date	Research aim	Participants	Measures	Findings
Ways of coping with IVF	Callan & Hennessey (1988)	To provide perceptions of emotional demands of IVF and describe coping strategies	-77 women - age M=32 years - infertility M=6 years - mainly high-school education (12% had college education) -ethnicity unknown (conducted in the Australia)	-open ended questions (beliefs about IVF, infertility and coping strategies) - open ended questions used to develop questionnaire later used in a follow up interview	- Main strategy used was positive attitude -Other strategies involve: keeping busy, staying calm, finding sources of support, finding other interests, developing a long term approach to IVF (i.e. planning on continuing until success is achieved), crying
	Lukse & Vacc (1999)	Identify levels of grief and depression and coping mechanisms	-50 IVF participants -age M=35 years -46 White, 2 Black, 2 Asian - marriage M =7.4 years -ethnicity unknown (conducted in the US)	-Depression Adjective Checklist -Grief Experience Inventory -The Schedule of Recent Experience -Ways of coping checklist	-Two most frequently used strategies were talking to someone and sleeping more than usual -Authors claim this is not an effective way of coping - Participants used problem focused strategies most frequently.
	Lee et al. (2010)	To identify grief responses and coping strategies in women who failed IVF treatment	-66 women with one IVF failure -age M=33 (±5.3) years -infertility M=4.0(±2.8) years -48.5% university education	-Jalowiec Coping Scale -Grief responses questionnaire	- High correlation between the use off and self-perceived effectiveness on all coping strategies except emotive coping -Bargaining most common grief response -most frequent coping strategy was confrontative, optimistic, self-reliant (i.e.

[1] Studies are presented in a chronological order according to their first appearance in the review.

			-ethnicity unknown (conducted in Taiwan)		more problem-focused than emotion focused coping strategies)
Coping strategies and emotional adjustment	Hynes et al. (1992)	Examine the effects of coping strategies on wellbeing	-100 infertile women and 73 controls - IVF women: age (m=32 years), marriage (m=9 years) -no significant differences between IVF women and controls -ethnicity unknown (conducted in Australia)	-self-report measure of depression (Mitchell, Cronkite & Moss, 1983) -coping assessment (Billings & Moss, 1981)	-problem focused coping =high level of wellbeing; in this study problem focused coping focused on cognitive rather behavioural strategies -avoidance= maladaptive - seeking social support = high levels of post IVF depression; might be because it is sought for emotional reasons.
	Litt et al. (1992)	To identify characteristics that predict adaptation following an unsuccessful IVF treatment	-41 women -age M=32.4 yrs -length of infertility treatment M= 2.8 years -ethnicity unknown (conducted in the US)	-Effects of Infertility - Brief Symptom Inventory (BSI) -Dyadic Adjustment Scale -Life Orientation Test -The Ways of Coping Strategies -Depression Adjective Checklist	-Dispositional optimism and belief that one had not acted in a way to contribute to infertility= buffer against distress - Loss of control and using escape as a coping strategy & feeling as though one contributed to infertility impacted negatively on distress -Optimists tend to find benefits even in adverse situations – optimistic women saw benefits to treatment that failed

	Verhaak, Smeenk, Evers et al. (2005)	Assess the predictive value of infertility related cognition, coping and social support for emotional response to an unsuccessful IVF	-187 women -age M=34.4 years - education equally distributed - infertility M=3.3 years -ethnicity unknown (conducted in the Netherlands)	-Eysenck Personality Questionnaire -Life Orientation Test -Illness Cognitions Questionnaire -Utrecht Coping List -Maudsley Marital Questionnaire -Inventory for Social support - STAI	-Acceptance and perceived social support are protective factors. -lower perceived social support contributed to increased depression -pre-treatment acceptance of possible failure predicted post treatment anxiety and depression
	Terry & Hynes (1998)	Examine the types of coping strategies and their impact on emotional adjustment	- Participants: T1=315; T2=171; T3=133 -no differences between responders and non-responders -age M=32.4 (±4.5) -90% white Australian, (remainder mainly Asian Australian) -98% completed high school education -relationship duration M=6.9 years	-BDI -State-Trait Anxiety Scale (STAI) - self-reports: task performance, coping effectiveness, partner rating of distress, coping, perceived control	-escapist coping strategies and problem-management strategies = poor adjustment -problem appraisal coping = better adjustment
	Wu et al. (2014)	Explore the relationship between coping strategies and depression	-288 IVF women -32 (±4.6) years -Chinese	-Brief COPE inventory -Centre for Epidemiologic Studies Short Depression Scale (CES-D10)	- Depression higher among women married more than 8 years and infertile for more than 6 -positive reframing, humour and use of emotional support associated with lower depression

	Bar-Hava et al. (2001)	Examine interrelationship between coping strategies, wellbeing and sexual functioning	-96 women enrolled for IVF -34(±5.2) years - 83% Israeli, 11% African-American, 3% European, 3% North American -93% married -30% had 1 child	-COPE inventory -Psychosocial adjustment to illness scale (PAIS)	-Positive reinterpretation, growth, acceptance, willingness to seek instrumental and social support, resorting to humour contributed to positive wellbeing -Positive reinterpretation and growth, and active coping were found to be positively associated with sexual functioning.
	Panagopoulous et al. (2009)	To investigate whether emotional disclosure would reduce distress in women undergoing IVF	-148 women -age M=33.8 (±4.6) years -98% married -10% had children -duration of infertility M=18 months -Greek	-STAI -PANAS -The infertility and Strain Scale (ISS) -Physical Stress Reactions	-emotional disclosure (writing) before IVF did not reduce psychological distress -Authors suggest that distraction based strategies may be better during anticipation of stress rather than emotion-focus ones.
Stages of treatment, coping and emotional adjustment	Boiving & Lancastle (2010)	To document the psychological processes that unfold during waiting period before IVF result	-61 women -age M=33.28 (±3.61) years -all but one had secondary education -infertility M=7.36 years -ethnicity unknown (conducted within the UK)	-Daily record keeping chart (developed for this study)	-Oocyte stimulation stage =positive affect; Waiting stage= positive affect and anxiety; Outcome stage =depression - Significant increase in coping activity between stimulation and waiting stage -Coping pattern varied

Impact of cognitions, beliefs and expectations of adjustment *This section also includes findings from Litt et al. (1992)	Reading et al. (1989)	To identify factors associated with distress after IVF failure and quantify fluctuation in psychological state.	-37 women - age M=35.8 years -marriage M=7.4 years -years trying to become pregnant M= 1.36 -ethnicity unknown (conducted in the US)	-Profile of Mood States (POMS) -General Health Questionnaire (GHQ) -activation-deactivation schedule (King et al. 1983) -Hassles and uplifts scale	-Women believing to have control or self-efficacy to cope with negative outcome reported less distress post treatment -Those disregarding unrealistic expectations may be better equipped to deal with a high-probability outcome
	Gourounti et al. (2012)	Find association between perception of infertility controllability and coping and psychological distress	-137 women -age M=36.1 (±4.3) - 95% had high school education (or more) - infertility duration M=4.0 (±2.3) years - ethnicity unknown (conducted in Greece)	-Illness Perception Questionnaire-Revised (IPQ-R) -The Fertility Problem Inventory (FPI) -State Trait Anxiety Inventory (STAI) -The centre for epidemiological studies-depression (CES-d) -Brief COPE	-low perception of treatment controllability was associated with frequent use of avoidance coping -High treatment controllability associated with problem-focused coping -low perception of control and avoidance positively associated with fertility related stress and anxiety
	Freeman et al. (1987)	To investigate IVF treatment stress and resolution of infertility	-156 women -age 32 years (±4) -96% Caucasian, 1 % Black, 1% Indian, 2% Asian -70% education beyond high school -all had prior infertility treatment	-Qualitative semi-structured interviews, which led to the development of the -Minnesota Multiphasic Personality Inventory -Locke-Wallace Marital Adjustment Scale -Rosenberg Self-esteem scale -Hopkins Symptom Checklist	-Resolution of infertility = acknowledging own infertility, absence of emotional distress, acceptance of alternative to the desired pregnancy - Resolution of infertility- correlated with coping and decision to abandon treatment -Resolution of infertility was not correlated with time since end of treatment

Motives for parenthood, parenthood goals and coping	Newton et al. (1992)	To identify motives for parenthood, and examine their relationship with emotional adjustment	- 631 (pre-treatment); 110 (unsuccessful IVF) - 23% 1 child from current relationship, 12% had 1 child from previous relationship - 31.4 (±3.8) years - 50% beyond high school education - ethnicity unknown (conducted in Canada)	-The reasons for parenthood scale -The state anxiety scale - The Beck Depression Inventory - The life appraisal inventory	Both pre and post treatment: -anxiety and depression were higher in those motivated by 'gender role fulfilment' and 'social pressure' - 'Role longing' = not predictive of distress after IVF failure - 'marital completion' = no relationship with emotional adjustment (both pre and post treatment)
	Cassidy & Sintrovani (2008)	To explore motives for parenthood in women undergoing IVF	-142 IVF women; 118 pregnant English women -113 undergoing IVF in the UK (107 White; 8 Asian), age M=33.8 -29 undergoing IVF in Greece, age M=33.5	-GHQ -The COPE -The Social Support Scale -Motives for parenthood	- Motivated by identity concern = negative impact of perceived social support - motivated by continuity and nurturance = increased perceived social support - Maladaptive coping increased with social pressure. - Parental motivation is culturally influenced
	Verhaak et al. (2007)	Gain insight into long-term adjustment to IVF	-380 women at T1-T3; of these, 298 women took part at T4 -21% already had a child -age M=33.4 (±4.1) years -all in heterosexual relationship -98% Dutch	-STAI -Dutch version of BDI -modes of adaptation (Van Balen & Trimbos-Kemper, 1994)	-women experience highest level of distress between oocyte retrieval and pregnancy testing -distress decreases immediately after receiving IVF result -women who focused on new life goals 3-5 years after failed IVF showed lower levels of anxiety and depression compared to those who persisted with attempt to conceive

	Bringhenti et al. (1997)	To evaluate the psychological adjustment of infertile women and determine whatl factors influence distress	-122 women going through IVF; control: 57 mothers -age M=34 (±3.96) - marriage M=7.7 years -education M=12.11 (±3.24) years -no children -ethnicity unknown (conducted in Italy)	-Rosenberg's Self-esteem Scale -Wilhelm and Perker's Intimate Bond measure -Kansas Marital Satisfaction Scale -Social readjustment Rating Scale	-distress related to treatment stress rather than overall psychological maladjustment -women with good personality disposition, high SE, job satisfaction, marital satisfaction, and willingness to adopt were protective factors for psychological adjustment
	Salmela-Aro & Suikkari (2008)	Examine the adjustment of child-related goal and its impact on depressive symptoms	-92 women - age M=3.92 - 42% had a university degree -relationship M=7.71 years -ethnicity unknown (conducted in Finland)	-Child related goal appraisal -PANAS scale - Beck Depression Inventory (BDI)	-The more importance and less attainment women place on achieving child goal the more depressed they were -Letting go of goals might support wellbeing
Protective Psycho-bio-social, spiritual factors *This section also includes findings from Litt et al. (1992), Bringhetti et	Mahajan (2009)	To identify intrapersonal and interpersonal associates of adjustment to infertility.	-85 women -34.2% younger than 30 yrs, 24.7% 30-33 yrs, 25.8% 33-16 yrs; 15.2% older than 36 yrs. -majority (36.4%) had 3.1-6 years of infertility - 41% had 3.1-6 years of marriage -ethnicity unknown (conducted in India)	-Perceived Internal Locus of Control Scale -Adult Attachment Style Questionnaire -Meaning of Parenthood Scale -Intrinsic Religiosity -STAI	-intrinsically religious women were better adjusted: adaptive belief system; infertility seen as part of a broader divine plan -better adjustment among women with familial support and sexual satisfaction -avoidantly attached women= poor adjustment - women seeing children as necessary for marital completion = poor adjustment

al. (1997), Hynes et al. (1992), Verhaak, Smeenk, Evers et al. (2005), Hynes et al. (1992), Bar-Hava et al. (2001)	Chochovski et al. (2013)	Assess whether and how resilience and marital quality are related to feelings of depression after unsuccessful IVF	-184 women with unsuccessful IVF outcome -86% married -Age range between 21 and 49 years -ethnicity unknown	-The Depression, Anxiety and Stress Scale (DASS-21) -The Resiliency Scale -Relationship Assessment Scale -Multidimensional scale of perceived social support (MSPSS)	-resilience inversely related to depression but positively to marital quality - marital quality became increasingly beneficial with time -resilience curbs initial distress, marital quality allows reflection on the experienced trauma
	Domar et al. (2005)	Does religion help women cope	-195 women - mean age 36.4 years (61% in their 30s) -50% graduate level -78% married -77% did not have a child -ethnicity unknown (Conducted in Boston)	-Fertility Problem Inventory -Spiritual Well-Being Scale -Beck Depression inventory	-Lower spiritual well-being predicted higher levels of depressive symptoms -Elevated depressive symptoms and longer duration of infertility predicted increased fertility distress
	Aisenberg Romano et al. (2012)	Assess whether there is a distinct psychological profile for women with explained (EIF) and unexplained infertility (UIF)	**EIF** -63 women -86.7% married **UIF** -42 women -73.8% married -Majority had high school or above education -ethnicity unknown (conducted in Israel)	-Minnesota Multiphasic Personality Inventory-2 -Life Orientation Test -COPE Inventory -Illness Cognitions Questionnaire -STAI -Centre for Epidemiological Studies Depression Scale	-No difference on personality, illness cog, life orientation assessment between EIF and UIF participants -More adaptive, better coping and functioning defensive system in women with EIF -differences attributed to ambiguous medical situation and uncertain prognosis

	Demyttenaere et al. (1991)	To investigate the endocrine and anxiety responses during IVF treatment	-40 women -age M=32.4(±4.1) -infertility duration M=6.1 years -ethnicity unknown (conducted in Belgium)	-Zung Depression Scale -Dutch adaptation of Westbrook Coping Scale -adaptation of Eysenck Personality Scale -Dutch translation of STAI	-Women with previous IVF attempts have more efficient emotional recovery- yet emotional response is the same -women with high trait depression are more state anxious before and after procedure – i.e. have poorly developed coping strategies -cortisol and prolactin higher in chronic ineffective copers.
	Isupova (2011)	Investigate the live experience of infertile women in Russia as revealed on internet forums	IVF patients' experiences were gathered from an online support forum www.Probirka.ru No specific participants used	Qualitative study - ethnography	- Women receive spontaneous social support (negative and positive) - psychological support of online communities-sharing story with people in similar situation - source of additional information community might play a substantial role in encouraging people to continue with IVF attempts

2.2 Ways of coping with IVF

Callan and Hennessey (1988) questionnaire study of 77 women explored the types of coping strategies used in response to IVF failure. The majority of women reported using positive attitude, followed by attempts to keep busy or calm, finding sources of support and other interests. Since then two more studies were conducted on the styles of coping with treatment related grief (Lukse & Vacc, 1999; Lee et al., 2010). The most frequently used coping strategies among 50 American women having experienced IVF failure were talking to someone and sleeping more than usual (Lukse and Vacc, 1999). On the other hand, the most frequent coping strategies among Taiwanese women were self-reliance, use of optimism and confrontation (Lee et al. 2010).

Both papers conclude that participants going through the grief of IVF failure tended to rely mainly on problem-focused rather than emotion-focused strategies. However, closer inspection of the results showed that participants made use of both styles of coping (Lukse & Vacc, 1999). The authors do not comment on this overlap and therefore it is unclear when women chose to use both as opposed to one coping approach.

Although such studies are useful in highlighting the variety of coping styles used by women, they are limited in terms of providing information about the effect of such strategies on psychological adaptation.

2.3 Coping strategies and emotional adjustment

Hynes, Callan, Terry and Gallois (1992) questionnaire study of 100 women found that high levels of wellbeing among those going through IVF were associated with problem-focused strategies. In contrast, avoidance coping strategies were associated with poor well-being. Similarly, Litt, Tennen, Affleck and Klock (1992) found that strategies which aim to

help women escape their source of distress were associated with high levels of distress following an IVF failure.

On the other hand, Verhaak, Smeenk, Evers et al. (2005) found that there was no association between avoidant coping and depression in their sample of 187 Dutch women. Such different findings could be explained by the use of different tools for measuring avoidance. Although Verhaak, Smeenk, Evers et al. (2005) assessed avoidant coping, their measures picked up on strategies where an individual first needed to acknowledge the stressor. It could be argued, that such measures do not have a high construct validity corresponding to the coping theory investigated (Lazarus & Folkman, 1988).

Terry and Hynes (1998) argued that one should explore the difference within these problem and emotion focused strategies. In their longitudinal study, the authors made a distinction between strategies which either focus on finding a solution to the problem (problem-management) or on the management of one's perception of the problem (problem-appraisal). Similarly, they distinguish between emotional approach coping (understanding and acknowledging one's feelings) and emotional avoidance. Problem-appraisal and emotional approach strategies were found to be associated with positive emotional adjustment following IVF treatment failure (Terry & Hynes, 1998). This finding suggests that appraisal and approach strategies may be more adaptive for low-control situations such as IVF, where problems may not be in the individual's capacity to solve and emotions may be too present to avoid (Terry & Hynes, 1998). This is consistent with the theory of coping, which suggests that strategies which allow the person to change the meaning of the stressor may be more adaptive in situations where nothing can be done (Folkman & Lazarus, 1988).

These findings were supported by Wu et al. (2014), who found that problem-appraisal strategies such as positive reframing and the use of humour were lower in depressed women

compared to women with no depression. In contrast behavioural disengagement was found to be higher among women without depression. Similarly, Bar-Hava et al. (2001) study of 96 women enrolled for an IVF programme found that positive reinterpretation, growth, acceptance and humour contributed to positive well-being and sexual functioning.

On the other hand, the benefit of emotional approach strategies has not been supported by other research. Panagopoulou, Montgomery and Tarlatzis (2009) conducted a randomised control trial to assess the use of writing as a form of emotional expression among women going through IVF, and its impact on distress. The findings showed that there were no differences in distress between women who used writing and their controls. The authors argue that these findings could be explained by the timing of the intervention. Women in this study were asked to write about their feelings during the waiting period after their embryo-transfer. Panagopoulou et al. (2009) argue that emotional expression may not be the most suitable coping strategy during the treatment waiting period, where distraction-based strategies may be more appropriate.

Overall there is some evidence to suggest that strategies which focus on helping women acknowledge and make sense of their situations, are associated with positive emotional adjustment following IVF treatment outcome. However, the research in this area is limited and only two of the seven papers identified, used a longitudinal design to assess adjustment. As such, these papers do not allow the reader to make conclusions about the direction of the impact of coping on wellbeing.

2.4 Stages of treatment, coping and emotional adjustment

There has been a recognition that coping and emotional adjustment needs to be assessed longitudinally as women face different stressors across the stages of treatment (Verhaak et al., 2007). Boivin and Lancastle (2010) study of 61 women living in the UK

monitored emotional reactions and coping during treatment. The trajectory of emotional reactions was well defined with anxiety levels peaking at the treatment result stage and low mood steadily increasing during the 7-day follow-up. However, the trajectory of coping was less clear. The authors found that there was an increase in the use of coping strategies between the active and waiting stages of treatment. Women were found to use coping strategies in various degrees during the 7-day follow-up. Boivin and Lancastle (2010) suggest that this points to women's efforts to deal with the demands of IVF treatment in whatever way their coping repertoire allows. A limitation of this study is that it does not provide analysis of the association between coping and the emotional outcomes. Therefore, it is unclear whether there is a relationship between these two variables, or whether emotional adjustment is predicted by factors other than coping strategies.

Overall there is a paucity of literature exploring coping across the stages of IVF treatment and its impact on women's psychological adaptation.

2.5 Impact of cognitions, beliefs and expectations on adjustment

Five studies investigated the role of control, acceptance of infertility and perception of infertility on emotional adjustment. In terms of control, Reading, Chang and Kerin (1989) found that among their sample of 37 women those who believed to have an ability to do something about their problem had lower levels of tension, depression, anger, fatigue and confusion compared to women who did not have this belief. Women who believed they could deal with treatment failure had significantly lower levels of depression, compared to women who felt they would be unable to do so. This is supported by Verhaak, Smeenk, Evers et al. (2005) who found that helplessness predicted higher levels of anxiety and depression following IVF failure.

Gourounti et al. (2012) explored the interaction between perception of control and coping strategies on emotional adjustment among 137 Greek women. The authors found that high perception of control over treatment was associated with problem-focused coping, low depression and low fertility-related stress. On the other hand, women who perceived themselves to have low control tended to use avoidance-focused coping, and experienced higher levels of depression and fertility-related stress.

Freeman et al. (1987) questionnaire study of 156 women showed that the more women accepted their condition, the higher their self-reported coping was. However, these conclusions must be interpreted with caution as the validity and reliability of the scale developed by the authors to measure participants' acceptance of infertility is unknown. Nevertheless, these findings are supported by Verhaak, Smeenk, Evers et al. (2005) who found that pre-treatment acceptance of possible IVF failure predicted lower anxiety and depression post treatment.

Women's appraisal of their infertility and treatment was also found to be related to their emotional adjustment. Litt et al. (1992) found that there was a positive relationship between the extent to which women believed they were responsible for their IVF failure and had lost control over their lives, and their level of distress. Interestingly, women who felt they had contributed to their infertility experienced less distress and fewer feelings of loss of control following an IVF failure. The authors conclude that feelings of responsibility over infertility may be protective as they allow women to experience a sense of agency. However, the authors' assessment of control and personal responsibility consisted only of two 10-point Likert questions. Previous literature shows that the construct of self-blame is complex and impacts on emotional wellbeing in inconsistent ways (Tennen & Affleck, 1990). Therefore, further research is needed to explore this finding in more detail and to see whether it can be generalised to a wider population of women seeking IVF treatment.

Although further research in this area is needed, these initial findings suggest that women's perception of control, agency and acceptance of their infertility are associated with more positive mental health outcomes.

2.6 Motives for parenthood, parenthood goals, and coping

Newton, Hearn, Yuzpe and Houle (1992) explored four types of parental motives; the pressure to fulfil gender specific roles, achieve marital completion, alleviate the social pressure to have children, and longing to become a parent. The authors found that pressure to fulfil gender-roles and attempts to alleviate social pressure were significant predictors of elevated anxiety and depression at the start and the end of the treatment. Interestingly longing for the parenting role and achievement of marital completion were not found to be significant predictors of post-treatment emotional adjustment. This is despite participants placing high value on these motives. A limitation of this research is its focus on motives driven by the need to resolve a personal or social conflict. As such, there was a lack of exploration of more positive motives for parenthood.

The above findings were in part supported by Cassidy & Sintrovani (2008), who found that concerns about fulfilling the feminine role of bearing a child and the wish to conform to the social pressure to have a child predicted the use of maladaptive coping strategies. Women, who were motivated by the personal need to have, care for and love a child, perceived themselves to have higher social support, which in turn decreased their psychological distress. In their analysis of Greek and English women, the authors found that Greek women tended to rely on more maladaptive coping strategies than English women. The authors argue this is linked to the Greek women's need to conform to the social pressure to have a child. However, the sample size of Greek women was generally small (n=29) compared to the sample of English women (n= 113). Therefore, such conclusions need to be treated with caution.

Rather than looking only at the goal of parenthood, Verhaak, Smeenk, Nahuis, Kremer and Braat (2007) assessed the impact of women's general life goals. The authors assessed women's emotional adjustment at the beginning, the end, at six months and at 3-5 years following the end of treatment. Women who continued to pursue their goal of pregnancy experienced significantly higher levels of anxiety and depression compared to women who focused on new goals or looked to adoption as an alternative option. Earlier research by Bringhenti, Martinelli, Ardenti and La Sala (1997) of Italian women going through IVF supports these findings. Women who did not desire to adopt a child and continued with repeating treatment cycles were found to be emotionally more vulnerable. However, Verhaak et al. (2007) found that women's anxiety and depression returned to baseline levels three to five years after the end of their treatment irrespective of what goals they had. This suggests, that factors other than life goals are involved in helping women adjust to the challenges of experiencing infertility.

Salmela-Aro and Suikkari (2008) study of 92 Finish women found that following an unsuccessful treatment, women tended to see their child goal as less attainable. While their perceptions of goal attainability began to increase again with time, the importance of the goal tended to decrease following an unsuccessful treatment. The more importance and less attainability women placed on their child-goal, the more depressive symptoms they experienced. Similarly to the findings by Verhaak et al. (2007), women in this study were found to have higher levels of depression if they were unable to disengage from their child related goal following an unsuccessful treatment outcome.

These findings suggest that women's motives for parenthood and goals of achieving pregnancy impact on their levels of anxiety and depression. However, there is evidence to suggest that other factors are also involved in helping women adjust to this stage in their lives (Verhaak et al., 2007).

2.7 Protective Psycho-bio-social-spiritual factors

2.7.1 Psychological factors

Several studies explored the impact of dispositional psychological traits on the psychological adjustment to IVF treatment. Women's resilience was found to be inversely related to depression following the treatment outcome (Chochovski, Moss & Charman, 2013). Litt et al. (1992) found dispositional optimism protected women from experiencing distress following IVF treatment failure. The authors argue that women with dispositional optimism tend to see their goals as attainable and therefore are likely to withstand the barriers that come in the way of these goals. On the other hand, no positive effect was found for situational optimism on psychological wellbeing (Litt et al., 1992). This could be explained by the fact that participants were asked to rate their optimism at the point of their initial appointment and as such their feelings may have changed throughout the course of the treatment.

Bringhenti et al. (1997) found that women who had a tendency for introversion, emotional instability and difficulties in social adjustment experienced higher levels of distress. Other explorations of intrapersonal characteristics showed that women with avoidant attachment style adjusted more poorly to their infertility (Mahajan et al., 2009) and those with higher levels of neuroticism experienced higher levels of depression and anxiety following a treatment failure (Verhaak, Smeenk, Evers et al., 2005).

Although many studies explored the effects of IVF treatment on women's wellbeing, only one has made the distinction between psychological and infertility related stress (Domar et al., 2005). In their study of 195 women Domar et al. (2005) found that higher levels of depression were predictive of higher infertility distress related to concerns about social and sexual functioning.

2.7.2 Biological factors

Only two studies focused on the biological aspects of infertility and women's psychological adjustment. Aisenberg Romano et al. (2012) compared 63 women with medically explained infertility to 42 women with unexplained infertility going through IVF. The results suggest that women with explained infertility utilised various defence systems, such as the tendency to deny their weakness or repression. On the other hand, they had a higher capacity to rely on social support than women with unexplained infertility. However, no differences between the groups were found for anxiety and depression. This suggests that although women with explained and unexplained infertility cope with their difficulties in psychologically different ways, this does not seem to impact on the level of distress they experience (Aisenberg Romano et al., 2012).

Demyttenaere, Nijs, Evers-Kiebooms and Koninckx (1991) assessed the relationship between endocrinological responses and coping. Forty women undergoing IVF were assessed during four 30 minute intervals before and after oocyte retrieval and embryo transfer on measures of anxiety, depression, coping styles. Simultaneously, participants' blood sample was tested for cortisol and prolactin levels. Prolactin levels were found to increase during the oocyte retrieval phase, but were unaffected during the embryo transfer. Cortisol levels, on the other hand, increased in anticipation of the treatment procedures. However, this gradually declined during and after the procedure. This suggests that the physical stress of medical procedures does not impact on the production of this stress hormone.

Women who relied on avoidance coping strategies had higher prolactin levels. Interestingly the use of comforting ideas following a treatment procedure was found to predict higher levels of cortisol, suggesting that this may be an ineffective coping method. These findings suggest that women's ability to cope with stressors may impact on their biological stress responses to infertility treatment. However, a key limitation of this study

was the low participant response rate (50%). As such, the findings need to be interpreted with caution as they may be the result of a selection bias.

2.7.3 Social factors

Women with no job and poor satisfaction with their role as a house-wife tend to experience greater emotional distress. On the other hand, a couple's affectionate relationship has been found to be protective against anxiety (Bringhenti et al., 1997). Interestingly, Bringhenti et al. (1997) did not find any effect of marital adjustment on the emotional responses of women going through IVF. These findings were present also in earlier research by Litt et al. (1992) who found that marital adjustment was not predictive of post-IVF distress. This suggests that woman's experience of her relationship (i.e. having a sense of affection), rather than her evaluation of the relationship is more important in protecting her against the stressors of IVF treatment.

In their study of 184 women Chochovski, Moss and Charman (2013) found that there was a positive relationship between martial quality and level of depression shortly after the treatment outcome. However, as time progressed there was an inverse association between marital quality and depression. Chochovski et al. (2013) argue that positive marital relationship may enable women to fully experience the emotional impact of treatment failure. However, with time, such positive relationship may facilitate recovery. In contrast Verhaak, Smeenk, Evers et al. (2005) did not find an association between marital quality and depression. However, they found that higher marital dissatisfaction predicted higher levels of anxiety post treatment.

Only one study assessed the impact of familial support rather than just the support of the partner. Mahajan et al. (2009) study of 85 Indian women found that there was an association between women who reported poor familial support and a decrease in adjustment

to infertility. Women who have found children as necessary for marital completion also showed poorer emotional adjustment.

According to Verhaak, Smeenk, Evers et al. (2005) higher perceived social support predicted lower depression following treatment failure. Interestingly, Hynes et al. (1992) found that women who sought out social support had higher post-IVF depression. The authors argue that women who seek social support feel unsupported and thus are more likely to be impacted by the challenges of such treatment. However, this was not supported by Bar-Hava et al. (2001), who found that women's willingness to seek social support in fact contributed to positive wellbeing.

The role of virtual support has so far received limited attention. Isupova (2011) conducted an ethnographic research looking at the perceived support among Russian women using online support groups. Women often felt blamed or misunderstood with regards to their infertility and as a result attempted to force others to become supportive or redirected the blame towards others. "Outsiders" who did not understand the experience of infertility and its treatment were avoided and childless friends were sought out. However, this left women feeling as though they were avoided by "normal people" (Isupova, 2011, pp.7). This suggests that women find themselves in a vicious cycle by seeking support among other infertile women, which lessens the communication with others and as such leaves them feeling unsupported. Nevertheless, Isupova (2011) also writes of women who have found online support invaluable in sharing practical information and getting a sense of belonging.

Even though Isupova (2011) highlights the benefits as well as the challenges of internet support, the impact of this type of support on emotional adjustment is less clear. As such, more research is needed to explore the links between internet support and emotional adjustment among women going through IVF.

2.7.4 Spiritual factors

Only two studies explored the impact of religious variables on women's emotional adjustment during IVF treatment. In a sample of 195 women living in Boston (US), 24% of participants reported becoming more religious during their experience of infertility (Domar et al., 2005). Domar et al. (2005) found that among these women, higher spiritual well-being was found to predict lower levels of depressive symptoms. This is supported by Mahajan et al. (2009) who found that intrinsic religiosity was predictive of better psychological adjustment among Indian women registered for IVF treatment. The authors suggest that women who are more religious hold beliefs such as being part of a higher divine plan, which may in turn facilitate acceptance of their infertility.

These findings suggest that religiosity is an important factor facilitating emotional adjustment among women across different cultures. However, the paucity of literature indicates that this continues to be a neglected area within research (Domar et al., 2005).

2.8 Literature appraisal: design and quality

Seven of the 11 papers using a cross sectional design have met all of the methodological quality criteria set by the Mixed Methods Appraisal Tool (Pluye et al., 2011) (Appendix C). The most common methodological limitation of the cross-sectional studies is the ambiguity regarding participant response rate. As such, it is unclear whether the findings have been based on a sample which is representative of the studied population. Further, Chochovski et al. (2013) failed to take account participant demographics in their data analysis. Therefore, it is unclear whether the participant characteristics may have impacted on the reported findings.

Eight of the papers employed a longitudinal design. This is viewed as a strength of the current evidence base as previous research showed that emotional responses are highly

variable across the stages of treatment (Verhaak et al., 2007). Thus research focusing on the psychological adaptation to infertility treatment should reflect this longitudinal change. However, majority of the studies explored adaptation only during the course of the treatment with a short term follow-up. Only one paper explored long term effects of coping (Verhaak et al. 2007). Therefore, future research should explore the long term effects of coping and adaption to IVF treatment.

Only three of the eight longitudinal studies met all of the MMAT quality criteria. The main limitation of such studies was the lack of description of how participants have been recruited. As such it is not clear whether participants who have taken part in this research have been selected in a way which minimises participant bias. The majority of studies used good quality measures with high internal validity and reliability. Only two studies did not meet this criterion (Verhaak et al., 2007; Litt et al., 1992).

Two of the three studies which used a descriptive design had a very high methodological quality (Lee et al., 2010; Bar-Hava et al., 2011). Only one study used a randomized control design (Panagopolou et al., 2009). However, the methodological quality of this paper was generally low. The authors failed to sufficiently describe the process of randomisation and state how allocation of participants to conditions was concealed from the participants or researchers.

Overall there is a lack of qualitative literature within the area of adjustment to infertility treatment distress. The systematic search generated only one study which explored this issue (Isupova, 2011). However, this research was of very good quality. The author demonstrated her reflexivity and clearly explained the qualitative methodology, type of information gathered and the context of the research.

The literature findings are mainly based on participants who were educated, married women, within their thirties. To a certain extent this is a representative sample of women undergoing IVF treatment (HFEA, 2013). However, women from diverse ethnic, cultural and socio economic backgrounds are underrepresented within the literature. As only one study was conducted within the UK, the current evidence base focuses on participants who would not have had access to a nationally funded IVF treatment. Therefore, participants from lower socio-economic backgrounds may be under represented in the literature.

3 Discussion

3.1 Summary of findings

3.1.1 Factors contributing to positive adjustment

Research focusing on the predictors of wellbeing suggests that strategies which allow women to approach and appraise their problem (by positively reframing, reinterpreting and accepting their difficulties) are predictive of lower distress. These findings are supported by Folkman and Lazarus (1988) who argue that strategies which direct the women's attention towards the problem may encourage them to work with the source of the problem, distressing thoughts or feelings.

Cognitions associated with the sense of control, ability to deal with and accept treatment failure and infertility also predicted positive adaptation. The thoughts of having contributed to infertility also predicted positive adaptation, suggesting that such thoughts may give a woman a sense of agency in an otherwise uncontrollable situation. This is also consistent with the coping theory, which suggest that focusing attention to the problem (e.g. thinking about the reasons for infertility) may provide the individual with greater understanding and a sense of control (Folkman and Lazarus, 1988).

Further significant predictors of psychological adjustment were goals and motives for parenthood. Women who were driven by their need to nurture a child or had the capacity to focus on other meaningful life goals, were found to have lower distress than those who focused on pursuing their fertility goals over a long period of time. Positive mental health was also predicted by dispositional optimism, religiosity and spiritual wellbeing. Affectionate relationships with the partner, familial support and social support were also associated with positive adaptation. These findings are consistent with the Theory of Self Complexity, which suggests that individuals with multiple self-representations experience lower distress following a failure (Linville, 1985). Therefore, women who view their identity as extending beyond their goal of becoming pregnant (e.g. being a wife, friend, believer, daughter, etc.) are likely to experience lesser distress when they cannot meet the task that correspond to their "mother/woman" identity.

3.1.2 Factors hindering adjustment

Emotion focused strategies such as avoidance and escape were found to have detrimental effects on women's mental health. Such coping strategies were found to be associated with beliefs of having low-control over the situation and an overall sense of helplessness. These in turn predicted poor adjustment and greater distress. These findings are consistent with Folkman and Lazarus' (1988) coping theory, which suggests that escape-avoidance strategies are usually associated with poor mental health outcomes.

Women who were driven to conceive in order to avoid social pressure, had poor relationships, no job, scored highly on measures of neuroticism and introversion, and had overall poor self-esteem experienced greater distress. These findings are consistent with the Theory of Self Complexity (Linville, 1985), which suggest that individuals with lower complexity experience greater distress in times of adversity. There is some evidence to suggest that women's wellbeing returns to baseline irrespective of what beliefs and goals they

have (Verhaak et al., 2007). However, this has not been reported elsewhere and therefore further research is needed to assess the impact of beliefs on the trajectory of women's adaptation to IVF treatment.

No difference has been found between women with explained and unexplained infertility and their psychological adjustment. However, there has been a link found between women's ability to cope and their physiological responses. Those who have been found to be ineffective copers have been found to have higher levels of cortisol and prolactin.

In terms of stages of treatment, the most distressing part of IVF was found to be the waiting and outcome stage. No one particular coping strategy was associated with any stage of treatment, suggesting that women attempt to deal with the various challenges of treatment in any way they can. This evidence also supports Folkman and Lazarus' (1988) claims of the complexity of coping behaviours. Longitudinal research shows that women rarely rely on only one strategy at a time.

3.2 Clinical implications

The current evidence base provides clinicians with information about the coping strategies and protective factors which support women in adjusting to IVF treatment. Clinicians should aim to assess the coping repertoire of their clients and encourage women to acknowledge and appraise their psychological distress and infertility difficulties. Problem-focused strategies have been found to predict positive emotional outcomes. However, clinicians should assess whether such behaviour is fostering resilience or whether it puts the woman at risk of failing to control an uncontrollable situation.

Women with a greater sense of control were found to have more positive psychological outcomes. Therefore, services should aim to foster women's sense of control and agency over the process of their fertility treatment. At an individual level, clinicians

should aim to work with women to foster their sense of agency in all aspects of their lives. Clinicians should be particularly mindful of women's feelings of personal responsibility for infertility, as this may be an important aspect of letting women maintain a control over their experience (Litt et al., 1992). However, clinicians should assess whether such beliefs of personal responsibility are indeed adaptive or whether they contribute to the individual's distress.

Women who primarily focus only on the goal of achieving pregnancy tend to experience greater distress. Therefore, clinicians should enable women to appraise their life values and encourage them to evaluate and build on various aspects of their identity. Clinicians should also be mindful of what motivates women in their efforts to achieve pregnancy. Women driven by the need to alleviate the social pressure to procreate, tend to experience greater distress and thus should be supported in making sense of the social pressures they may face.

Relationships were found to be significant protective factors in helping women adjust to the stresses associated with infertility and IVF. Thus, in addition to providing individual psychological support for women going through IVF, services should recognize the need for providing systemic consultations to both partners as well as the individual's wider family.

3.3 Further research

The current evidence base comprises of mainly cross-sectional and longitudinal studies. Although the cross-sectional literature is generally of good quality, its clinical usefulness is less clear. Previous research findings highlight that coping and psychological adaptation varies across the stages of treatment and women's fertility experience. Therefore, further research should aim to reflect this longitudinal change. The limitation of the current longitudinal research is the short span across which adjustment is assessed. Only one study

explored women's adaptation 3 to 5 years post treatment. Therefore, there is a need for further studies which would explore the long term effects of infertility treatment on psychological adaptation.

Only one randomized control trial has been identified in this systematic review. Therefore, there is a need for further research using this methodology. There is a lack of evidence with regards to the forms of support women receive throughout the course of their infertility treatment. Randomized control trials, would be best positioned to assess whether different forms of support (i.e. psychological or routine medical) impact on women's psychological adaptation to infertility treatment.

Future studies should also aim to gather participants from different ethnic and socio-economic backgrounds. Women with lower income are particularly underrepresented in the current evidence base. Even though the studies identified in the review have been conducted in various locations across the world, the specific cultural influences on psychological adaptation to IVF treatment have not been explored in a methodologically robust manner. Future research should aim to fill this gap.

Overall there is a lack of qualitative literature within the area of adjustment to infertility and treatment distress. Qualitative investigations go beyond the identification of an association between studied variables to provide an explanation of a mechanism by which such variables interact (Miles & Huberman, 1994) and the meaning people attribute to their experiences (Taylor, Bogdan, & DeVault, 2015). Further, qualitative research can provide an understanding of the process in which the already identified coping mechanisms are drawn on to facilitate the psychological adjustment among infertile women.

According to Richardson (2002) there are three waves to exploring resilience within a given field. The first aims to explore the qualities, assets and protective factors that foster

resilience in individuals facing adversity. The second wave of research aims to elucidate a process through which the resilience characteristics are acquired and applied in an attempt to cope with adversity, with the third wave identifying motivational forces that drive an individual towards self-actualization.

To date, infertility research has focused on the first wave, by exploring coping strategies and factors associated with psychological adaptation. However, so far the current evidence does not provide clinicians and researchers with a theoretical understanding of how the process of resilience and adaptation manifests among women experiencing repeated conceptions failures. As such, further research should aim to focus on this second wave of resiliency research (Richardson, 2002). In particular, a theoretical explanation of how women carry on with their attempts to conceive through the adversity of infertility treatment is needed.

4 Conclusion

This paper aimed to provide a systematic review of the literature focusing on psychological adjustment and coping among women going through IVF. The evidence base suggests that women employ various coping strategies in their efforts to deal with the stress of IVF treatment. Emotion focused strategies such as avoidance and escape were found to have detrimental effects of women's mental health. On the other hand, strategies which help women approach and appraise their source of distress were found to be more adaptive. Affectionate relationships with the partner, familial support, intrinsic religiosity, wider life goals, and dispositional optimism were found to be associated with better mental health outcomes. The literature findings suggest that coping and adaptation within the context of infertility treatment is highly complex. Therefore, further research should attempt to provide some clarity over the process women go through to adapt to the challenges of assisted reproductive treatments.

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Section B

Living through repeated unsuccessful conception attempts: A grounded theory of resilience among women undergoing assisted reproductive treatment

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Abstract

Objective

To provide a theoretical model of resilience among women undergoing fertility treatments, who experience repeated unsuccessful conception attempts.

Design

A qualitative study using a Grounded Theory approach.

Setting

Women living in the UK recruited online who self-identified as having fertility difficulties.

Sample

Eleven women aged between 24 and 41 years, undergoing various assisted reproductive treatments.

Method

Participants took part in individual semi-structured interviews around their experiences of living through unsuccessful fertility treatment attempts. Interviews were audio recorded, transcribed, and subsequently analysed using the Grounded Theory methodology.

Results

Three core categories were identified; "Appraisal"; "Stepping away from treatment" and "Building self up for next attempt". Participants demonstrated their resilience by taking steps to build up their resources in preparation for next conception attempts, by nurturing their strength and taking control of their fertility experience. Those who had depleted their resources through the cycle of attempting pregnancy had taken a step back from the treatment cycle to reconnect with themselves, before attempting conception again.

Conclusions

Women undergoing fertility treatment demonstrate their resilience through a variety of actions that enable them to continue to pursue their pregnancy goal. Clinical staff should be

mindful of their client's need to withdraw from the treatment cycle and offer support to enable women to do this. Further research should aim to explore resilience among women from diverse ethnic backgrounds.

Key words: Resilience; Assisted Reproductive Therapy; IVF; Women; Failed Conception

1 Introduction

1.1 Infertility, psychological functioning and infertility treatment

Infertility affects one in seven couples living in the UK (Human Fertilisation and Embryology Authority (HFEA), 2013). The desire to have a child and the difficulty achieving this goal is a highly distressing experience (Thorn, 2009). Anxiety and depression levels are reported more frequently by infertile than fertile couples (Greil, 1997). Although infertility is distressing for both women and men, women often report greater distress and poorer mental health than men (Greil, Slauson-Blevins, & McQuillan, 2010). Domar, Zuttermeister and Friedman (1993) argue that the distress women report as a result of facing infertility is often comparable to other serious conditions such as cancer. It is not uncommon for women undergoing infertility treatment to report symptoms of depression and isolation (Cousineau & Domar, 2007).

Couples in the UK who fail to conceive within a year are eligible for clinical investigations and infertility treatment (NICE, 2013), which can be accessed either through NHS or private clinics. The provision of NHS treatment is determined by local clinical commissioning groups and therefore varies across the UK (HFEA, 2015). The type of treatment offered is determined by the diagnosis of the fertility problem (Appendix S). However, where possible women are offered less invasive treatments in the first instance, such as medication, followed by intrauterine insemination (IUI), and subsequently IVF (NICE, 2013).

Women report that such treatments impact on their hormone levels and mood, and can cause physical pain or discomfort (Cousineau & Domar, 2007). The success rates of such treatments are relatively low, with the highest success rate of live births resulting from an IVF treatment being 32.8% (HFEA, 2013).

Despite these adverse circumstances, women experiencing fertility difficulties repeatedly continue to seek out assisted reproductive therapies. As such there is a need for a greater understanding of how women adapt to the adversity of having unsuccessful treatment outcomes and carry on taking part in fertility treatments.

1.2 Resilience: construct and definitions

The concept of resilience originated from child and adolescent research (Rutter, 1985). Early studies focusing on resilience aimed to explore the characteristics associated with individuals that have shown the ability to survive adversity (Richardson, 2002). Cognitive factors such as intelligence and creativity, or environmental factors such as social support were seen to contribute to "resilience" (Tusaie & Dyer, 2004). However, with the development of the literature, resilience became to be viewed as a dynamic process of an interaction of individual and environmental factors (Richardson, 2002).

Despite the agreement that resilience research has shifted from an exploration of resilient qualities to a process of coping, the definitions of resilience continue to vary. While Richardson (2002) views resilience as a process that helps individuals purely to "survive adversity" (p.309), Tusaie and Dyer (2004) believe that resilience is a process which allows individuals to "thrive from adversity" (p.4). Bonanno (2004) on the other hand defines resilience as an ability "to maintain relatively stable, healthy levels of psychological and physiological functioning" (p.20). Despite these differences, resilience is seen as an adaptive process, which has been receiving increasing attention within the infertility literature.

1.3 Models of resilience

1.3.1 The Resiliency Model

Richardson, Neiger, Jensen, and Kumpfer (1990) proposed a model of a process through which resilient qualities of individuals facing various stressful events are acquired and utilised (Figure 1).

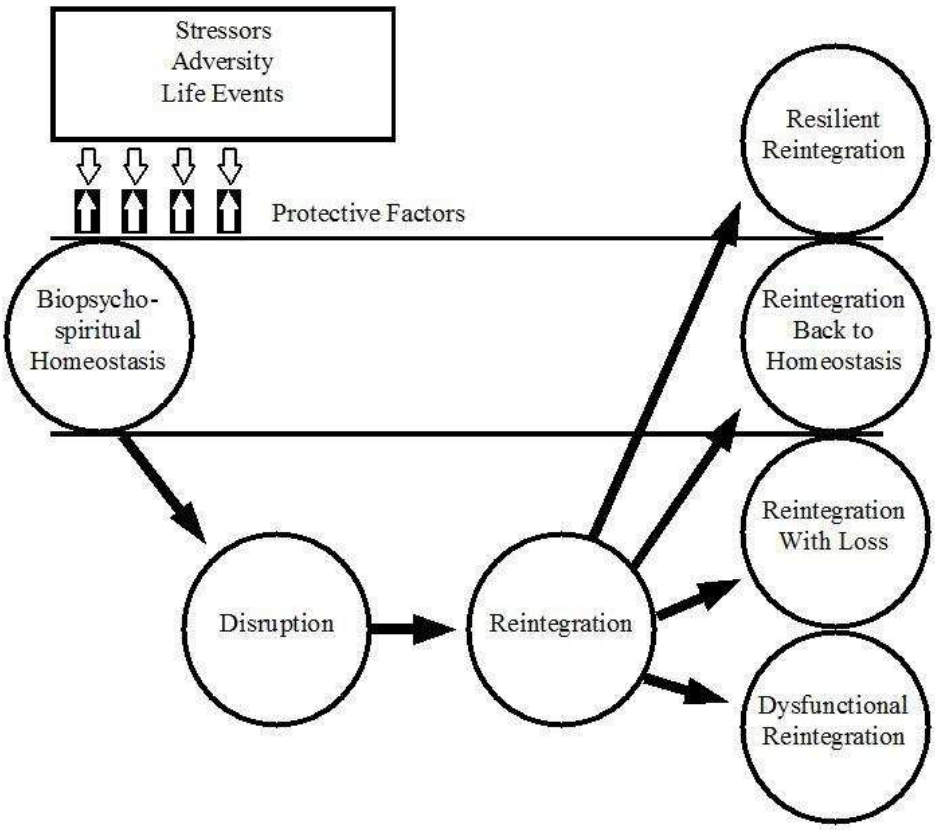

Figure 1. The Resiliency Model

According to Richardson et al. (1990) resilience begins with the individual having reached an adapted state of body, mind and spirit (i.e. homeostasis). However, this state is constantly threatened by incoming stressors. In order to cope with these, individuals utilise protective factors such as coping skills and personal qualities. The homeostasis is disrupted if these protective factors cannot withstand the onslaught of the stressors. Disruptions trigger emotions that may lead to introspection and facilitate the attempt to return to homeostasis.

Resilient reintegration refers to the process of being able to grow through disruptions. Reintegration back to homeostasis is the ability to just get past the disruption. Reintegration with loss and dysfunctional reintegration, occur when an individual is unable to reach the homeostasis and either loses hope and motivation, or resorts to destructive behaviours (e.g. substance misuse).

The strength of the model is its generalisability, which lends itself to be applied to the understanding of various populations and adverse situations. However, this model only provides a linear explanation of resilience (Richardson, 2002). In terms of infertility, women repeatedly take actions which are likely to cause them distress (i.e. take part in low success rate treatments). Therefore, such overarching model of resilience does not explain the cyclical nature of women's attempts to overcome the adversity of repeated conception failures and their repeated investment into attempting to achieve pregnancy.

1.3.2 Infertility Resilience Model (IRM)

To date only one model has been developed to explain the process of resilience within infertility. Ridenour, Yorgason, and Peterson (2009) synthesised existing literature focusing on protective factors and adaptation among couples experiencing infertility to provide a model of resilience (figure 2).

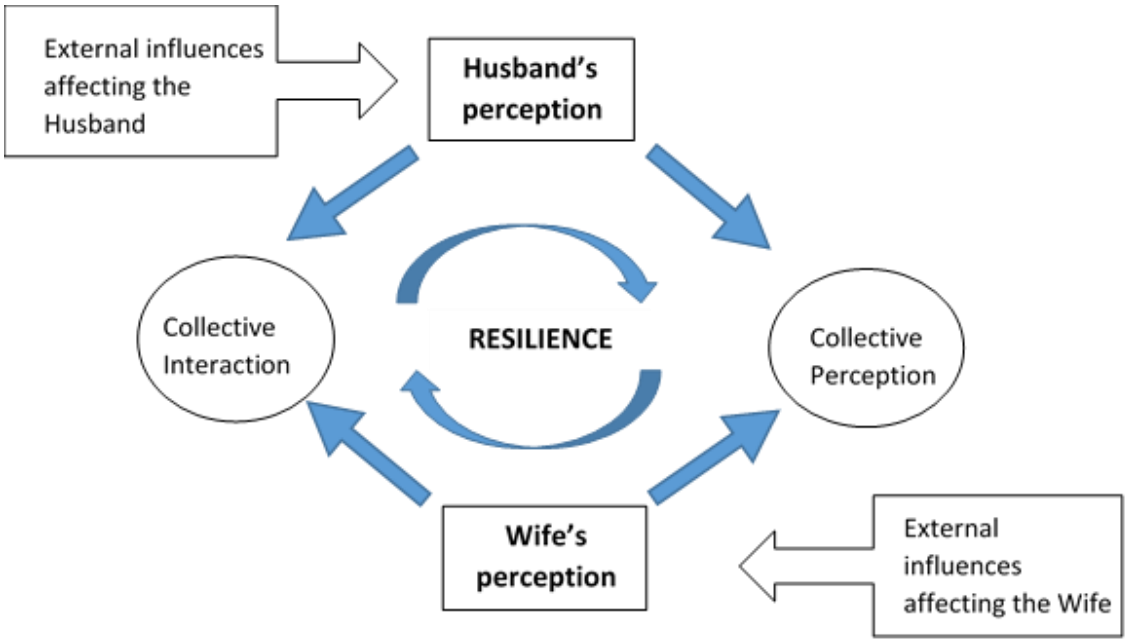

Figure 2. The Infertility Resilience Model

The IRM proposes that individuals experiencing infertility are influenced by external factors such as ethnicity, duration of infertility, or diagnosis. As the external factors are not shared, they separately shape the individual's beliefs and responses to stress. However, these individual perceptions and coping strategies can be redefined when they are met with the partner's appraisal. At the individual level, infertility can be seen as being out of one's control. However, the collective perception of the situation can alter this view (Ridenour et al., 2009). According to the IRM, the couple's resilience is defined by the interface between the collective perception and interaction of the situation.

The IRM demonstrates the authors' attempts to provide a synthesis of a wide range of infertility literature to offer the first model of infertility resilience. As such the IRM is a broad framework, which does not provide a theoretical explanation of the individual experience of infertility. While it highlights the connection between the partners who experience fertility

difficulties, it does not contribute to the understanding of the process individuals go through to adapt to repeated failed conception attempts.

1.4 Infertility and resilience

Although the theoretical understanding of resilience within infertility is not yet well understood, several studies have highlighted that resilience is associated with positive mental health outcomes. Resilience has been found to be lower among infertile individuals than their fertile controls (Sexton, Byrd, & von Kluge, 2010). However, its presence was found to be negatively associated with infertility specific distress, general distress, and depression (Sexton et al., 2010; Chochovski, Moss, & Charman, 2013), and positively associated with post-traumatic growth (PTG) (Yu et al., 2014), marital satisfaction (Ganth, Thiyagarajan, & Nigesh, 2013), and quality of life (Herrmann et al., 2011).

The association between resilience and distress was found to be moderated and mediated by time and coping. For example, Chochovski et al. (2013) found that resilience was associated with lower depression shortly after a negative IVF treatment outcome. However, as more time elapsed, the association of resilience and depression disappeared (Chochovski et al., 2013). Action-focused coping skills, such as taking part in self-care activities, were found to correlate with resilience (Sexton et al., 2010) and mediate the relationship between resilience and PTG (Yu et al., 2014). Resilience was also found to have a mediating role between social support and psychological distress (Mousavi, Karimi, Kokabi, & Piryaei, 2013).

Lee, Blyth, and Chan (2012) explored the adjustment to infertility of Chinese women undergoing IVF. One of the four themes discovered in their analysis was that of resilience. This was characterised by participants' ability to maintain the strength of their marital relationship through open communication, acceptance of childlessness, and an ability to resist

the pressure from the community. However, the authors did not elaborate on how these factors contributed to resilience.

Peters, Jackson, & Rudge (2011) attempted to answer this question in a narrative analysis of resilience in childless couples. The authors suggest that couple's ability to relinquish the goal of parenthood signified resilience, by allowing them to progress to other areas of their lives. Further, resilience was demonstrated by the individual's ability to use their experiences for the benefit of others. Finally, the ability to depend on one another was seen to foster resilience. However, this study focused on couples already identifying themselves as childless with no intentions of achieving pregnancy. Therefore, it is unknown whether similar processes occur among individuals who have not reached this stage and continue to attempt to achieve pregnancy.

1.5 Rationale for current study

Since women with fertility difficulties often report greater psychological distress than men, there is a greater need to understand what helps women adapt to the adversity of repeated failed conception attempts, whilst in the process of seeking assisted reproductive therapies. Several studies have demonstrated the positive role of resilience in psychological adjustment to the experience of infertility. However, there is insufficient theoretical understanding of what contributes to this process of resilience. Existing theories define resilience only as a linear process of adaptation and fail to explain what helps women to continue to take part in assisted reproductive methods. This study aims to fill this gap in literature.

1.6 Aim of the research

The aim of this research is to provide a theoretical understanding of the process women go through to adapt to the adversity of unsuccessful assisted reproductive treatment attempts and to continue to pursue their goal of achieving pregnancy.

2 Method

2.1 Design

A qualitative design using a Grounded Theory (GT) was used (Corbin & Strauss, 2008). According to Birks and Mills (2011) the use of GT is appropriate under three circumstances, all of which were met by the current study.

1. There is little known about the research area
2. The desired outcome of the study is to generate an explanatory theory
3. The aim is to explicate a process imbedded in the area of research

2.2 Epistemological stance

A critical realist position was taken during this research. This stance acknowledges the existence of an objective reality which is external to human consciousness. However, any sense made of this reality is seen to be socially constructed through the use of language, meaning-making and social context (Oliver, 2011). Within this position the researcher is viewed as a social being influencing the data collection and analysis. However, this influence is again seen as information to be used as part of the data to be included in the analysis (Glaser, 2007). The researcher using critical realist GT aims to address both the event under investigation as well as the meaning made of the event.

2.3 Participants

Participants were in the first instance recruited using purposive sampling. Initially women were included if they identified themselves as having fertility difficulties and were

seeking medical treatment for these. Women were excluded from the study is they identified themselves as attempting to conceive without any medical interventions or were no longer pursuing pregnancy (either after a successful fertility treatment or after deciding to remain childless).

Theoretical sampling was used following the first three interviews where the emerging concepts determined what participants needed to be sampled next (Urquhart, 2013). This involved seeking participants of varying ages and ethnicity, at different stages of their fertility journeys, those who had previous success with fertility treatments and participants with varying treatment options.

Recruitment occurred online through various fertility websites, forums and Facebook groups (Appendix D). Overall, 27 women expressed an interest in the study. From these, 13 did not respond to subsequent email communication, one did not live in the UK, and two did not meet the theoretical sampling requirements. A total of 11 women took part in the study (see table 1).

Table 1.

Participant demographics[2]

Participant # and name	Age (years)	Ethnicity	Infertility reason	Time trying to conceive (years)	Assisted reproductive treatments undertaken	Children	Treatment accessed (private or NHS)	Future plans for achieving parenthood
1. Maria	33	White Latvian	unknown medical	5	2x IUI, 2 x IVF	0	NHS & Private	Private treatment (IVF or other), adoption
2. Suzanne	37	White British	known medical	3	Medication, 2x IVF	0	Private	Two more rounds of IVF
3. Beth	41	White British	known medical	6	Medication, 4x IVF	0	NHS & Private	Up to 3 donor egg cycles (private)
4. Katherine	27	White British	known medical	3	Medication	0	NHS	Medication & IVF
5. Melanie	42	White British	known medical	4	Surgery, 3x IVF	0	NHS & Private	Private IVF only
6. Jane	31	White British	known medical	6	2x IVF	1 (IVF success)	Private	IVF
7. Rachel	24	White Irish	known medical	2	Medication	0	NHS	2x IVF (NHS), adoption, fostering
8. Hannah	36	White British	unknown medical	4	Medication, 2x IUI	0	NHS	1 more IUI, 2x IVF (NHS)

[2] Participant names have been changed to preserve confidentiality

Participant # and name	Age (years)	Ethnicity	Infertility reason	Time trying to conceive (years)	Assisted reproductive treatments undertaken	Children	Treatment accessed (private or NHS)	Future plans for achieving parenthood
9. Sophie	30	White British	known medical	4.5	Medication, IVF	0	NHS	Further IVF, adoption
10. Julia	27	White British	known medical	2	Medication	0	NHS	IVF (NHS)
11. Lucy	37	Mixed White Asian	known medical	4.5	2x IVF	0	NHS	Donor egg IVF, Adoption, possibly staying childless

2.4 Ethical considerations

The research was scrutinized and approved by the Canterbury Christ Church University ethics committee (Appendix E). Ethical practice during the course of the research process was guided by the BPS Code of Ethics and Conduct (The British Psychological Society, 2009) and the values of the NHS Health Research Authority (NHS Health Research Authority, n.d.). The sensitive nature of the research area was held in mind by the researcher throughout the research. Participants were given sufficient time to decide to take part in the study and were informed of their right to withdraw their participation at any point (Appendix G; Appendix H).

The NHS Security Management Service (2009) lone working policy was followed when conducting interviews in participant's homes. Following the interview, participants were given a debrief form and an information sheet outlining the support services in their locality (Appendix I). Participants were given ten pounds as a compensation for their participation. This was seen as an appropriate amount which would not exert any undue influence over the individual's decision to take part in the research.

2.5 Procedure

Semi-structured interviews were conducted to allow participants the flexibility to tell their story yet provide a structure for times when they did not know what to say (Strauss & Corbin, 1998). The researcher's role was to help enable participants to share their experiences by stepping in only to elaborate on their responses or to provide structure when discussion turned to topics other than those being investigated.

The research questions and aims served as a basis for the development of a flexible interview guide (Appendix J). The interviews were conducted separately for each participant and were between 55 and 95 minutes in duration. Participants were given a choice of a face-

to-face or a telephone interview to ensure their comfort. Two participants were interviewed in person and nine over the telephone. All interviews were audio recorded and subsequently transcribed.

The participants were eased into the interview process by being asked demographic information questions. This was followed by an open ended question about the everyday life in the context of having fertility difficulties to allow participants the flexibility to share their story. Participant responses were clarified through the use of prompts and follow up questions. The interview was ended by asking participants to reflect more broadly on coping with adversity in the past, to ensure the interview ended with them being reminded of their strengths and resources.

2.6 Data analysis

The data was analysed using procedures associated with the GT (Strauss & Corbin, 1998; Corbin & Strauss, 2008; Charmaz, 2006; Urquhart, 2013). The analysis proceeded through the steps described below, although not in a linear fashion.

1. Open coding was used for the first three interviews where the text was analysed line-by-line. This process enabled a complete emersion into the data and allowed the researcher to stay open to new ideas of where to proceed with the data analysis and collection (Urquhart, 2013). Initial codes were kept close to the text by making them active or in vivo (Charmaz, 2006).

2. Focused coding was used for subsequent interviews where the most frequent or significant codes were used to analyse larger segments of the data. This process allowed the researcher to test and determine the adequacy of the earlier codes (Charmaz, 2006).

3. Axial coding was used to categorise existing codes into subcategories and categories according to their properties and dimensions. Questions such as “when, where,

why, how" were used to reassemble earlier codes based on their shared properties into higher order categories (Strauss & Corbin, 1998).

4. Theoretical coding was used to establish the nature and the relationship between categories, and as such integrate them into a theoretical model (Urquhart, 2013). This process was facilitated by the use of integrative diagrams which allowed the researcher to gain distance from the data and clarify the relationship between categories in a logical manner (Corbin & Strauss, 2008) (Appendix N).

The coding and data collection was ended when theoretical sufficiency was met, whereby the existing categories "coped adequately with new data" in such way that they no longer need to be extended or modified (Dey, 1999, p. 117). Throughout the analysis, constant comparisons were made between the sets of data, to find conceptual similarities and differences between the codes and categories (Corbin & Strauss, 2008). Memos were utilised throughout the research to guide the process of analysis, data collection, theoretical sampling and theoretical coding (Corbin & Strauss, 2008) (Appendix M).

2.7 Quality assurance

According to the critical realist position the researcher has an impact on the data collection and interpretation (Urquhart, 2013). This influence was monitored throughout the research process through various quality checks detailed below.

2.7.1 Respondent validation

There are different views with regards to the need of obtaining respondent validation in qualitative analysis. The researcher followed the views of authors who argue that respondent validation in GT is subsumed by the process of simultaneous data collection, analysis and constant comparison (Birks & Mills, 2011; Elliott & Lazenbatt, 2005). The initial codes were kept close to the participant's accounts through the use of in vivo codes

which are seen to strengthen the authenticity of the data (Urquhart, 2013). The emerging themes and processes were discussed with the participants as data collection progressed. Participants were asked to reflect on whether they identified with the information already collected or whether their experiences differed. A preliminary theoretical model was shared with the final participant who was asked to comment on how her experiences related to the emergent theory.

2.7.2 Credibility checks

The complete line-by-line coding of the first interview was consulted with the research supervisor. Subsequently sections of coded text were shared and discussed with the research supervisor to determine whether appropriate focused codes were used to describe larger sections of data. Any disagreements with regards to the way the text was coded were discussed until it was agreed upon. The development of the sub-categories, categories, and the theoretical models was also consulted with the research supervisors, until a "theoretical formulation" was reached (Corbin & Strauss, 2008).

Memos about the connection between categories and emergent themes were written throughout the research process. The development of the categories, with corresponding quotes is documented in Appendix L. A research diary was kept to note down any research and analytic decisions made throughout the research process (Appendix P).

2.7.3 Reflexivity

A bracketing interview was conducted prior to the data collection and analysis, to identify areas of potential bias and set them aside as not to influence the research process (Ahern, 1999) (Appendix O). A research diary was kept throughout the research to continue to bracket any arising subjective views and opinions. The researcher kept in mind her own

identity and opinions regarding assisted reproductive therapies throughout the research process.

2.7.4 Mode of interviewing

Irvine, Drew, and Sainsbury (2012) highlighted several differences between telephone and face-to-face interviews. For example, telephone interviews have been found to be shorter but less disrupted by utterances than those conducted in person (Irvine et al., 2012). Therefore, particular attention was paid to the duration of the interviews and participants speaking over the telephone were given sufficient time to share their experiences. On the other hand, an attempt to minimize the disruption during face-to-face interviews was made by keeping "acknowledgment tokens" (e.g. okay, uh huh) to a minimum. Any significant differences between the interviews were seen to be a reflection of the individual participants rather than the interviewing style.

3 Results

3.1 Overview of the model

The data analysis led to the development of 32 sub-categories. These formed 10 higher level categories and finally contributed to the development of 3 core categories "Appraisal"; "Stepping away from treatment" and "Building self up for next attempt" (see Appendix L). An overview of a higher level model integrating the three core categories (figure 3) will be discussed in the first instance. This will be followed by the discussion of the interrelationship between the 10 categories that led to the development of the higher level theoretical model (figure 4).

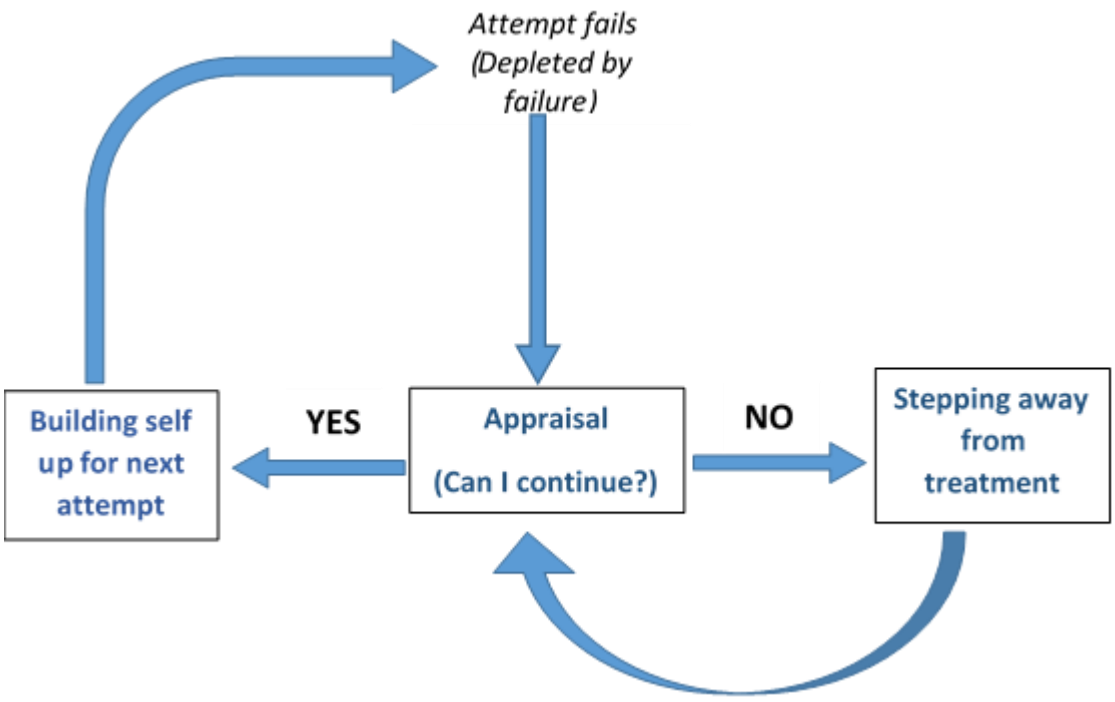

Figure 3. Appraisal of the ability to carry on with conception attempts

Participants' resilience in the journey to achieving pregnancy was characterised by a series of linked coping strategies, centred around the repeated appraisal of one's capability to continue with further conception attempts. When faced with a conception failure, participants experienced a depletion (i.e. felt distress and despair) which prompted them to evaluate their intentions to carry on trying to achieve pregnancy. Greater resilience was demonstrated by the ability to "build self-up" in an effort to get ready for the next treatment attempt. This involved actions such as "taking control of the treatment" or finding ways to "nurture own strength". Participant's resilience was diminished when the experience of failed conception attempts depleted their resources (emotional and practical) and they were no longer able to maintain this cycle. However, the process of stepping away from the treatment cycles, reconnecting with aspects of one's life which may have been lost in the cycle of attempting pregnancy, allowed participants to restore their resilience and attempt pregnancy through the path of fertility treatment again.

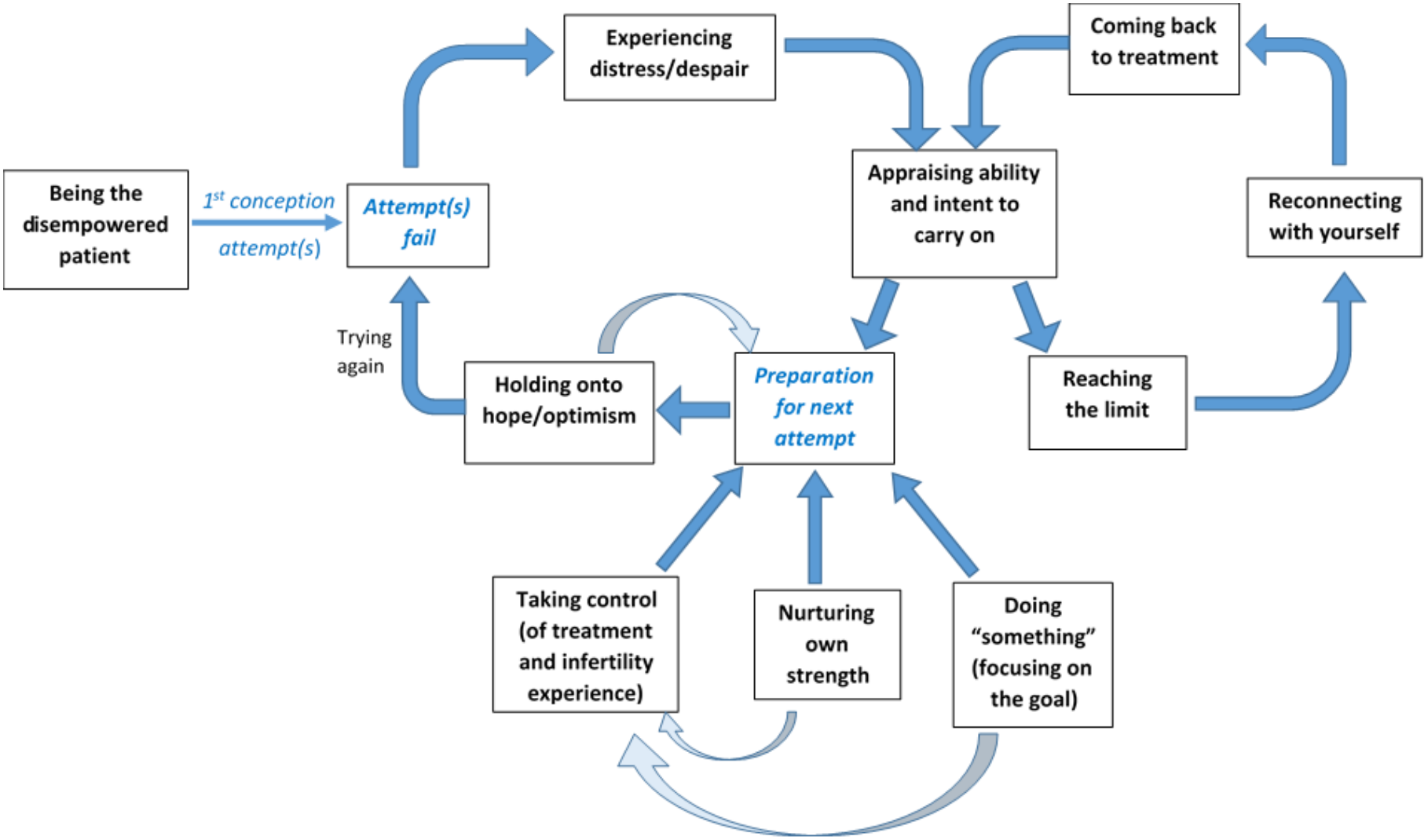

Figure 4. The process of living through repeated failed conception attempts

3.2 Process of living through repeated failed conception attempts

Figure 4 depicts the detailed process participants lived through in their attempts to deal with repeated failed conception attempts. The process is explained by initially focusing on the start of a woman's conception journey, followed by the explanation of the 3 main categories outlined above.

3.3 Start of the journey

Category 1: Being the disempowered patient

Participants described their journey through fertility treatment beginning with having limited or no knowledge of the process that they were about to undertake. They shared that before the start of any unfamiliar procedure they found themselves fully trusting their doctors and followed their advice without questioning. This was due to being confronted by a vast amount of information that they struggled integrate and having a limited knowledge of the treatment.

> *"I suppose as far as the IVF goes, I am very new to it. When it comes* to infertility *treatment and investigations and ongoing issues, I feel like I'm an old hand, because I've been through it for a long time now, but with IVF, it's not something that I am familiar with" [Sophie]*

> *"When it comes to your own health, you seem* to go to the GP and just trust everything *they say. And it's the same with the consultants so if you go in, and you know nothing yourself about infertility you just trust, you just hope." [Melanie]*

3.4 Appraisal

Category 2: Experiencing distress/despair

Following the failure of a treatment and conception attempt participants reported experiencing high levels of despair and distress. Women often compared this time to a process of grief during which they mourned their unborn child.

> *"I'd say it is a grieving process. Erm to me the embryos were babies even though they're* one in a million babies but they're my babies and it's the nearest I've ever gotten to being *pregnant" [Suzanne]*

The distress appeared to be compounded by the fact that participants have undergone procedures which were seen to enhance their fertility and chances of pregnancy. Therefore, some participants viewed the failed conception as a personal failure rather than a treatment failure.

> *"You both kind of feel like 'what's wrong with us?' It's a lot* more difficult on that side *because you feel you've had help erm and you've got more chance […] but if that doesn't work you just…it's just heart breaking, it's the only way I can describe it."* [Hannah]

Participants shared that although they were aware of the success rates of fertility treatment they remained hopeful that they would be successful. Therefore, the treatment failure not only signified a loss of a possibility of pregnancy but also a loss of hope, leading to feelings of hopelessness.

> *"After each either period that you have and you know that you're not pregnant, or […] after a IVF treatment where it's definitely not worked, then that can be really hard because you've had a little bubble of hope for a while […] sometimes the hope feels hard* becau*se you know that it's the other side of despair" [Lucy]*

Some participants spoke of their distress being compounded by various barriers to treatment (i.e. being on an NHS waiting list). These appeared to prevent participants from moving forward and thus fed into their feelings of hopelessness and despair.

> *"Of course there is nothing the gynaecologist can do for me until I lose the weight so I am kind of stuck in the limbo. If I don't lose the weight, they won't do anything".* [Katherine]

Category 3: Appraising ability and intent to carry on

The experience of distress and despair prompted participants to evaluate their ability and intent to carry on with further treatment and conception attempts. Participants assessed their practical and emotional resources and reviewed their own limits.

Participants' decision to carry on with treatment was determined by their appraisal of the likelihood of future treatment success. Women considered the statistical chances of achieving pregnancy and evaluated the success of their previous attempts. Although only one participant achieved pregnancy through IVF, other participants also deemed their previous attempts as having been partially successful. The view that something had been achieved in the previous attempts made participants appraise their chances of a future pregnancy more favourably and as such they decided to pursue further treatments.

> *"We've had 3 IVFs now but only one failure but if we'd have 3 IVFs and 3 failures then that's a different thing isn't it. […] See, so in that sense I can't say I've had 3 failed IVF attempts. I've have one failed IVF attempt and everything else is kind of erm suspended if you like, erm so no I wouldn't give up obviously unless it was so stressful that I had to face this every time." [M*elanie]

Participants described being driven towards further attempts by an "internal force". Some of the factors feeding into this force were the want to experience a pregnancy or a feeling that the time to have children was running out.

> *"Some people ar*e a lot more accepting and think ok what are our other options you *know we can adopt […] I just kind of really desperately want to become pregnant and it's just not happening so I guess it's just different reactions isn't it" [Hannah]*

However, some participants came to a point where they felt the process of fertility treatment had too many emotional and practical costs, and questioned their own ability to continue with further treatment attempts. They considered whether they had sufficient practical, emotional and physical resources which they could invest into further attempts.

> *"You're then saying to yourself 'well, the chances of me getting pregnant naturally are sort of slim to none, you know, so if I don't do it I give up. If I do do it, I'm borrowing money I don't have. […] I'm not sure I would want to do that, because for me at least the process is so physically demanding, so emotionally demanding, it's a really horrible experience to go through that I wouldn't want to do it again." [Lucy]*

Although some participants had clear views about whether they wanted to pursue further treatment or not, others experienced a mixture of emotions and did not see the decision to continue as being straight forward.

> *"Sometimes I do have moments of 'right this is going to be my final go' and about half an hour later it will be like 'oh no because the fourth go could be the time that works if the third time doesn't work' [Suzanne]*

3.5 Building self up for next attempt

Participants who made the decision to carry on with further conception attempts entered a stage in which they prepared and built themselves up for the next attempt. This was done in the following ways.

Category 4: Taking control

In contrast to the initial views being the disempowered patient, after the experience of a failed conception attempt participants were found to take control of their fertility and treatment. Participants recognised that despite the extensive training, health care professionals were unable to help them achieve pregnancy. This awareness of the professional's limited power made participants reclaim some of the control handed over to their doctors initially. By doing so, participants hoped to find the answers their doctors were unable to provide.

> *"My husband said if you compare the first m*eeting we had with the doctor the way we, the way I spoke and asked the things and if you compare the way I go in and the terms I *use, it's like a professional talking. [….] with the time and information on Google you start to know so much […] You don't tr*ust anyone any more you think you know the *best." [Maria]*

Participants identified that by taking control of their fertility experiences they were able to let go of the despair they felt after their conception failure, since it allowed them to refocus on their goal of achieving pregnancy.

> *"You think what your next step's gonna be. You plan your next move and I mean everybody who's been through this will say that it's that why you keep going"* [Beth]

Category 5: Nurturing own strength

In preparation for the next attempts participants also 'built themselves up' by recognizing and nurturing their own strength. Participants thought back to past experiences of adversity and considered their own personality. This enabled them to identify strategies which helped them get through past difficulties and allowed them to cope in a way that was personally meaningful.

> *"I have a lot of support from my husband, we've been together for a long time since I was 18 we've been together and obviously naturally in that space of ti*me, things are *going to happen and you know, life isn't always sunshine and roses [.....]I think that's something, like knowing that I have him for support is obviously very helpful" [Sophie]*

> *"I've obviously been in a dark place before when I first, you kno*w, started getting pain *and stuff in my stomach. I don't want to go back there again. Do you know? So you kind of just, just fight it off and try not to think about it." [Rachel]*

Participants also nurtured their strength by preparing for any potential pitfalls that could arise along their fertility journey. This enabled the participants to set relevant support in place or take steps which buffered the impact of the distress.

> *"I feel like I'm always trying to be sort of one step ahead of the game, prepare* myself, *because I think the thought of failure as well is quite a hard thought of how I'm going to feel if it fails and how I'm going to cope with that [...] the knowledge of other options* that are available if it does fail helps me to feel a bit better abou*t it." [Julia]*

Whilst many participants reported drawing on the support they received from their partner or families, they also found themselves distancing from people in whose company they experienced distress. This enabled them to maintain the emotional strength and positivity needed to carry on with the treatment attempts, and allowed them to share some of the burden of fertility treatments.

"It's just knowing that you have that support behind you, and somebody who's pretty much feeling everything that *you're feeling. It's good to know that, that you're not alone with it." [Rachel]*

"I didn't want to speak to anybody and I didn't want to talk about babies, I didn't want to talk about children, I didn't want to see children, definitely not, or pregnant women." [Jane]

The attempts made to nurture own strength were seen to have a function of allowing the participants to have control over their fertility experience and wellbeing.

*[Reason for not discussing infertility] "So they don't keep asking if I am pr*egnant. I *don't want someone to keep asking me because then it sort of rears its head again and then it has taken over my life." [Jane]*

Category 6: Doing "something"

Participants spoke about the need to actively take steps in an attempt to move closer to their goal of pregnancy. Women prioritised the treatment over other aspects of their lives and searched for alternative treatment methods or supplements that could aid their fertility.

"I am between the treatments like taking the folic acid, taking vitamin D. It still makes *you feel like you are doing something instead of doing nothing." [Maria]*

Although participants were aware that such alternative treatments had limited effectiveness, it was the act of trying to do something, which was seen as important. Through "doing something" participants were able to reduce their feelings of being stuck in the limbo of infertility and were able to hold onto the hope that the next time will be successful.

*"I think you get a step closer to trying to solve your fertilit*y issues erm because sometimes you do need that help from the doctor, you do need drug treatment to help

you. I think if you didn't go you would be stuck in limbo as kind of I am now" [Katherine]

Again the attempts to "do 'something'" were viewed as the participants' attempt to gain a sense of control over the uncontrollable process of fertility treatment and conception.

"You just control what you can control with it, so it's things like I know a lot of people take lots of vitamins and thing because they *think 'it makes me think like I'm doing something positive so therefore I am in control of it'." [Beth]*

However, the feeling as though one needs to be proactive in their attempt to achieve pregnancy places women in a vulnerable position where they may be drawn to expensive or redundant treatments.

"You know if there was a woman on there who said 'right you need to go out tonight at midnight and naked and run around your street or estate or whatever' you'll probably go like 'right that's what I need to do and I'm gonna do it' it's even to the point of 'have a clown in the room when you're having the transfer to make you laugh'" [Maria]

Category 7: Holding onto hope/optimism

The steps taken in preparation for next treatment or conception attempt were seen to feed into participants' hope that the next attempt will be successful and as such helped them to hold onto optimism.

"Maybe there's different vitamins you can try or different herbs […] which might make some difference to your body, your health […] then you can feel like an element of hope, *because you've changed something small." [Lucy]*

These feelings of hope and optimism in turn contributed to participants' efforts of preparing themselves for the next treatment attempts and motivated them to attempt conception again.

> *"You have to know that there is hope cause otherwise why are you doing it? There would be absolutely no point for me if I didn't think there was any hope what so ever."* [Hannah]

3.6 Stepping away from treatment

Category 8: Reaching the limit

Some women along their journeys have made the decision to take a break from the cycle of attempting pregnancy. This was precipitated by their appraisal of their resources and a view that they had reached a limit necessitating them to take a break from the cycle of conception attempts. Women spoke about exhausting their resources, feeling the strain of the treatment and feeling as though they were losing themselves in the process of fertility treatments.

> *"I know some women go on and on and have fertility trea*tment and IVF ten times over. How they manage that I do not know, your mind and body, but there's got to be point *when it just says I just can't take no more." [Suzanne]*

Category 9: Reconnecting with yourself

The acknowledgement that the conception attempts have been too draining, led the participants to take the time to reconnect with themselves. Women spoke about making the decisions to put themselves first, making a decision to take a break and to take the opportunity to reconnect with their "normal" lives which did not centre around fertility. This allowed women to regain some of the strength that they have lost to the cycle of conception attempts.

"After we finished the Clomid, because we sort of felt a bit exhausted after it really, and a bit despondent and we just felt we needed time together. And it did do us good, took a *week away." [Julia]*

"I had a failed IVF attempt with the fresh cycle […]and then I took a year out and gathered myself." [Jane]

Category 10: Coming back to treatment

The ability to step away from treatment and reconnect with the self, allowed women to feel ready to pursue the next treatment and attempt to achieve pregnancy again. Prior to assessing their ability to carrying on with further attempts, participants spoke about making preparations to come back and feeling ready to face the cycle again.

"We have tried that as well going you know went to Egypt in September we went to visit other families and relatives around the world you now, yeah you do relax for some time but then you a*re back in with all of this" [Maria]*

"With a little bit of breathing space and time I suppose you can kind of pick yourself up and carry on really" [Lucy]

4 Discussion

4.1 Summary of findings

This study offers a theoretical model of women's ability take part in assisted reproductive treatments despite facing repeated conception failures. Women's resilience was characterised by their ability to evaluate their capacity to carry on with conceptions attempts, ability to build themselves up for the next treatment attempts (by taking control of their fertility experience, nurturing their strength and continuously working towards their goal),

and by the ability to withdraw from the cycle of conception attempts when their resources have depleted.

4.2 Links to theory and previous research

The current theoretical model of resilience provides support to the concept of "resilient reintegration" proposed by Richardson et al. (1990) whereby the experience of adversity may lead the individual to identify their resilient qualities. The participants demonstrated "resilient reintegration" through their ability to recognize ways in which to nurture their own strength. Richardson et al. (1990) argued that some individuals may fail to adapt to adversity by losing hope and motivation, and may resort to self-destructive behaviours. However, this was not supported by the current model. By taking control of their treatment participants felt as though they were working towards their goal, which fed into their sense of hope and optimism that the next attempt will be successful. This supports previous research by Salmela-Aro and Suikkari (2008) who found that women's perception of the attainability of achieving pregnancy increased with time since treatment failure.

Participants did report experiencing intense levels of distress and grief after having had a failed conception attempt. Grief responses to infertility and conception failures have been well documented (Hammer Burns & Covington, 2006; Lee et al., 2010). Although findings from previous research suggest that a failed conception attempt can lead to a prolonged phase of mourning and distress (Volgsten, Svanberg, & Olsson, 2010; Verhaak, Smeenk, van Minnen, Kremer, & Kraaimaat, 2005), participants in the current study were able to overcome this distress by taking active steps which directly contributed to and maintained their hope and optimism. Harris (2011) argues that women often become isolated in their grief due to the loss of their existing supports. However, this was not supported by the current model where participants were found to draw on different forms of support in an attempt to nurture their strength.

The process of "reaching the limit" has also been supported by previous research. Verhaak, Smeenk, Nahuis, Kremer, and Braat (2007) found that women who have struggled to disengage from the goal of achieving pregnancy following an unsuccessful treatment outcome had higher levels of depression than those who were able to focus on other goals. The current theoretical model suggests that women who carry on with their attempts to conceive and are unable to continue to build themselves up for the next attempts may reach a point where they deplete their resources. Previous research shows that highest levels of depression are reported among women who have had fertility difficulties for 2 to 3 years (Domar, Broome, Zuttermeister, Seibel, & Friedman, 1992). This suggests that a longer duration of infertility may lead to depleted resources.

Such finding may be initially viewed as more aligned with the concept of endurance (i.e. pushing self to the limit) rather than resilience characterised by ones' ability to maintain a healthy level of functioning (Bonnano, 2004) or thrive from the experience of adversity (Tusaie & Dyer, 2004). It is necessary to consider this distinction and explore whether women continue to push themselves through the process of repeated assisted reproduction until they exhaust their capacity to continue or whether they display an ability to bounce back from this adverse experience.

Some participant's reported the need to step away from the treatment after an unsuccessful conception, as they felt their resources have depleted. This is supported by earlier research which suggests that the most common reasons for why women drop out of treatment is seeing the process as having too many physical and emotional costs (Hammarberg, Astbury, & Baker, 2001; Verberg et al., 2008). Similarly, couples who have transitioned into childlessness have done so when they have had no more left to give (Daniluk, 2001).

However, unlike Daniluk's (2001) findings, the current model suggests that women who feel they have exhausted the ability to continue, have found a way back to attempting pregnancy again, by allowing themselves to re-connect with aspects of their lives that were separate from their fertility lives. As such, participants have not only pushed themselves to the limit and endured the process of assisted reproduction, but demonstrated resilience by their ability to restore their depleted resources in the context of failed assisted reproductive treatment.

Interestingly resilience did not manifest itself differently in women who had medically unexplained infertility (UIF) to those with explained infertility (EIF). It could be argued that such women face different stressors and therefore may need to rely on different adaptive strategies. Although Aisenberg Romano et al. (2012) found that women with EIF had better adaptive and coping system that women with UIF, such differences between psychological functioning were not replicated in studies with greater sample sizes (Wischmann, 2003). The current model supports the argument that the psychological functioning between women with EIF and UIF is comparable (Thorn, 2009).

Tusaie and Dyer (2004) argued that resilience will be affected by the context surrounding the individual. In this study women have shown their resilience by "taking control" of their experiences and focusing on their individual needs. This may in part reflect the historical and cultural context within which this study was conducted. Individuals in westernised cultures engage in behaviours which allow them to individuate from others and focus on their individual needs (Boucher & Maslach, 2009). This was depicted in the current model where women's actions were seen to support their own needs rather than the needs of their system (e.g. families). However, the focus on individual treatment needs also appeared to come at a cost to other aspects of one's life and necessitated participants to withdraw from the treatment cycle in order to restore the balance in their lives.

The issue of control within the experience of infertility has also been documented in previous research. Campbell, Dunkel-Schetter, and Peplau (1991) found that women generally perceived themselves to have a low sense of control over pregnancy but felt they had control over their medical treatment. The current model builds on this evidence to explain how this sense of control is obtained and contributes to women's ability to carry on with the process of fertility treatments. In the preparation for the next attempt, participants have been found to take actions which directly contributed to their sense of control (e.g. making plans for next treatment steps). In doing so they have been able to hold onto hope which motivated them to carry on with further conception attempts.

4.3 Clinical implications

The theoretical model highlights the importance of women's need to have control of their fertility experience. As such fertility services should aim to support this by allowing women to take an active role in their treatment and be transparent in their decision making processes. Further, clinician's should be mindful of women's need to gain control over their treatment by seeking out various alternative methods. This may place women in a vulnerable position of potentially being exploited by services offering expensive and perhaps redundant treatments. Therefore, services should aim to offer women consultation about various alternative methods sought out or offered to them.

The current theoretical model provides an explanation of the stages women go through in their attempts to achieve pregnancy with the support of medical interventions. As such it can offer clinicians an understanding of where their clients may find themselves when they are accessing their services and know what support may be most appropriate. Clinical psychologists could draw on this model to help their clients assess whether they have sufficient resources to continue with treatments and offer it as an explanation of why it may be beneficial to step away from the cycle of attempting pregnancy, in order to prevent further

depletion in physical and mental wellbeing. Clinicians could also draw on this model to highlight the importance of maintaining a balance between fertility and non-fertility aspects of one's life in order to prevent the loss of resources to the cycle of infertility treatments and to sustain the ability to pursue one's pregnancy goal.

4.4 Limitations

Although an attempt was made to sample theoretically for cultural factors, participants were mainly British English. From a critical realist epistemological stance, the process of resilience was therefore understood within the context of a western influences in which the participants and the researcher were situated. The theoretical model reflects women's individualism in their efforts to focus on their needs and to "take control" of the process of achieving pregnancy. Therefore, one limitation of the model is its narrow focus on the individual experience without acknowledging wider systemic and cultural influences.

As Culley (2009) points out, there are cultural differences between individuals' motives for pregnancy. Whilst secondary infertility is distressing to many women, those living in South Asian communities face additional cultural pressures to produce more than one child (Culley, 2009). Therefore, it is possible that the experience of women from minority ethnic groups would have been different to those described in this research.

Further, this research focused on resilience within the process of seeking some form of medical intervention for fertility. As such, the model does not explore the experiences of women who do not have the choice of accessing medical support for their fertility difficulties. According to Greil et al. (2010) individuals with low socio-economic status continue to be underrepresented in the study of infertility. Within the context of the NHS, the impact of economic status on fertility treatment may be less significant than in countries with funded

health care. Therefore, it is not clear whether resilience manifests itself differently among women who do not have the option of a funded treatment to help them achieve pregnancy.

4.5 Further research

Since Grounded Theory does not aim to generalise the research findings, further research is needed to determine the applicability of the model to wider populations. Quantitative methods could be utilised to tests women's adaptation and wellbeing across the different points of their fertility journey. Specifically, quantitative research could address the question whether wellbeing differs between women who take a break from treatment compared to those who continue to pursue it. Further research could also aim to answer the question whether women who identify themselves as having sufficient emotional, practical and physical resources are more likely to take part in repeated treatment attempts to those with fewer of such resources. Such research could identify women who are more at risk of needing mental health support during their fertility journey.

Further qualitative research could aim to expand on the current model to account for the experiences of women from minority ethnic groups, deprived socio-economic areas, and non-western cultures. This would extend the understanding of how women, who are often underrepresented within infertility services and research, adapt to the adversity of infertility treatments. This information would allow clinicians to offer more culturally informed interventions.

Future research could also build on the current model to explain the process women go through in an attempt to exit the cycle of fertility treatments and provide more understanding of what enables them to do this successfully. The current model suggests that women tend to find a way back into treatment even after making the decision to step away from the continuous attempts of achieving pregnancy. This therefore poses the question,

whether and when does complete transition into childlessness occur. Such information would contribute to the clinician's understanding of the different processes involved in stepping away from treatment temporarily or permanently, and knowing how to best support such transitions.

5 Conclusion

Resilience in women experiencing repeated failed treatments is characterised by an ability to assess the capacity to continue with further conception attempts, and by withdrawing from the treatment cycle when the necessary resources have been depleted. Women have demonstrated an ability to restore depleted resources by either reconnecting with themselves in areas of life that do not involve fertility issues or by taking control of their fertility experience. As all participants had access to NHS funded treatment further research should aim to explore resilience among women from more diverse background. In particular, greater understanding is needed of how resilience is manifested among women from minority ethnic groups and those who do not have access to publicly funded health care.

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Section C

Appendices of Supporting Material

Appendix A - Summary of Coping Strategies

(Folkman & Lazarus, 1988)

Coping strategies	
Problem Focused	**Emotion Focused**
Confrontive/interpersonal Planful problem solving	Distancing Escape-avoidance Accepting responsibility/blame Exercising self-control over the expression of feelings Seeking social support Positive reappraisal

Pathways of coping	**Types of strategies**	**Function of strategies**
Deployment of attention	Avoidant Strategies	Diverting attention from the source of distress
	Vigilant Strategies	Diverting attention to the source of distress
Altering subjective meaning of the encounter	Denial/distancing	Distorting the reality/detaching one self
	Selective attention	Emphasizing the positive aspects of a situation
	Cognitive coping strategies	Transforming a threat into a challenge
Changing the actual terms of the encounter	Confrontive problem solving	Interpersonal strategy (e.g. standing own ground, getting others to change their mind)
	Planful problem solving	Making a plan of action to solve a problem

Appendix B - Copy of the Mixed Methods Appraisal Tool (MMAT)

Types of mixed methods study components or primary studies	Methodological quality criteria (see tutorial for definitions and examples)	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	Are there clear qualitative and quantitative research questions (or objectives*), or a clear mixed methods question (or objective*)?				
	Do the collected data allow address the research question (objective)? E.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study components).				
	Further appraisal may be not feasible or appropriate when the answer is *'No' or 'Can't tell' to one or both screening questions*				
1. Qualitative	1.1. Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?				
	1.2. Is the process for analyzing qualitative data relevant to address the research question (objective)?				
	1.3. Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected?				
	1.4. Is appropriate consideration given to how findings relate to researchers' influence, e.g., through their interactions with participants?				
2. Quantitative randomized controlled (trials)	2.1. Is there a clear description of the randomization (or an appropriate sequence generation)?				
	2.2. Is there a clear description of the allocation concealment (or blinding when applicable)?				
	2.3. Are there complete outcome data (80% or above)?				
	2.4. Is there low withdrawal/drop-out (below 20%)?				
3. Quantitative nonrandomized	3.1. Are participants (organizations) recruited in a way that minimizes selection bias?				
	3.2. Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes?				

	3.3. In the groups being compared (exposed vs. non-exposed; with intervention vs. without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups?				
	3.4. Are there complete outcome data (80% or above), and, when applicable, an acceptable response rate (60% or above), or an acceptable				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?				
	4.2. Is the sample representative of the population understudy?				
	4.3. Are measurements appropriate (clear origin, or validity known, or standard instrument)?				
	4.4. Is there an acceptable response rate (60% or above)?				
5. Mixed methods	5.1. Is the mixed methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed methods question (or objective)?				
	5.2. Is the integration of qualitative and quantitative data (or results*) relevant to address the research question (objective)?				
	5.3. Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative				
	Criteria for the qualitative component (1.1 to 1.4), and appropriate criteria for the quantitative component (2.1 to 2.4, or 3.1 to 3.4, or 4.1 to 4.4), must be also applied				

*These two items are not considered as double-barrelled items since in mixed methods research, (1) there may be research questions (quantitative research) or research objectives (qualitative research), and (2) data may be integrated, and/or qualitative findings and quantitative results can be integrated.

Appendix C - MMAT Appraisal of Reviewed Papers

Authors & date	Study design	MMAT score	MMAT criteria not met
Isupova (2011)	Ethnography	****	-
Hynes et al. (1992)	Cross-sectional	****	-
Wu et al. (2014)	Cross-sectional	****	-
Newton et al. (1992)	Cross-sectional	***	3.4: Participant response rate is unknown
Cassidy & Sintrovani (2008)	Cross-sectional	**	3.3: Different sample sizes and characteristics of two sets of participants (English n=113; Greek n=29) 3.4: Participant response rate in unknown
Lukse & Vacc (1999)	Cross-sectional	****	-
Gourounti et al. (2012)	Cross-sectional	****	-
Chochovski et al. (2013)	Cross-sectional	**	3.1 Participants recruited through social media, and thus potentially leading to selection bias 3.2 Participant characteristics are not taken into account in the analysis
Mahajan et al. (2009)	Cross-sectional	****	-
Litt et al. (1992)	Cross-sectional	**	3.2 Many measures used have questionable reliability (alpha < 0.6) 3.4 Response rate is not stated
Bringhetti et al. (1997)	Cross-sectional	****	-
Domar et al. (2005)	Cross-sectional	****	-
Terry & Hynes (1998)	Longitudinal	****	-
Salmela-Aro & Suikkari (2008)	Longitudinal	***	3.4: Low retention rate at six-month follow-up (55%)

Verhaak et al. (2007)	Longitudinal	***	3.2: No clear validity or standardisation of one measure provided
Boivin & Lancastle (2010)	Longitudinal	****	-
Demyttenaere et al. (1991)	Longitudinal	**	3.1 First 40 respondents out of 80 selected. This may have led to selection bias. 3.2 One measure (Dutch version of Westbrook Coping Scale) had a low test-retest reliability
Reading et al. (1988)	Longitudinal	**	3.1 Omission of information regarding how participants were selected and recruited 3.4 It is unclear what the response and follow-up rate was
Verhaak, Smeenk, Evers et al. (2005)	Longitudinal	****	-
Aisenberg Romano et al. (2012)	Longitudinal	***	3.1 Participants older than 42 years were excluded from the study potentially leading to a selection bias
Lee et al. (2010)	Descriptive correlational	****	-
Bar-Hava et al. (2011)	Descriptive correlational	****	-
Callan & Hennessey (1988)	Descriptive	**	4.3 Measurements are not of clear origin 4.4 Response rate not stated
Freeman et al. (1987)	Mixed methods: sequential exploratory design	***	5.3 Consideration is not given to the limitations of integration
Panagopoulou et al. (2009)	Quantitative randomized	**	2.1: Randomisation not sufficiently described 2.2. Allocation concealment not described

Note: MMAT score definitions: * (one criterion met) - **** (all criteria met)

Appendix D - List of Websites and Facebook Groups Used for Recruitment

Websites

Infertilitynetworkuk.com

Netmums.com

Babycentre.co.uk

Pregnancyforum.org.uk

Twoweekwait.com

Facebook groups

Infertility Network UK

PCOS Fertility Support UK

ENDO/PCOS/Fertility Support UK

Infertility Awareness and Support Group

Infertility Inspirations

PCOS TTC baby no 1 UK

Infertility TTC Support Group

Appendix E - Ethical Approval

This has been removed from the electronic copy.

Appendix F - Study Advert

Living through unsuccessful conception attempts: Understanding women's experiences

Are you having difficulties becoming pregnant?

If you have answered yes to this question, I would like to hear from you.

I invite you to take part in a doctoral study[3] looking at women's experiences of living through unsuccessful conception attempts.

Women who struggle to become pregnant often report poorer wellbeing, than those who have not had such difficulties. However, most women do not require **psychological** support during this period in their life. Therefore, we are interested in gaining a better understanding of how women manage their wellbeing and live through their difficulties of becoming pregnant.

What will I get?

We are offering **£10** to those who participate in this research.

How will this benefit me?

We cannot promise the study will help you directly. However, some people have reported benefits of taking part in research interviews such as having an opportunity to make sense of their personal experiences and share their story.[4]

What will you have to do?

You will be asked to take part in an interview where I will ask you some questions about your experience of having difficulties becoming pregnant. However, it is up to you how much of your experience you want to share.

Where can I get more information?

Please get in touch with me (Anna Bailey, Trainee Clinical Psychologist) on a.truckova287@canterbury.ac.uk

Alternatively, you can call the 24-hour voicemail research line at 03330117070 (Salomons Centre, Canterbury Christ Church University) and request to speak with me.

[3] Funded by Canterbury Christ Church University

[4] Murray, L. (2003). Qualitative research interviews: therapeutic benefits for the participants. Journal of Psychiatric and Mental Health Nursing, 10, 231-238.
Dyregrov, K. (2004). Bereaved parents' experience of research participation. Social Science & Medicine, 58(2), 391-400.

Appendix G - Participant Information Sheet

Participant Information Sheet

Hello. My name is Anna Bailey and I am a trainee clinical psychologist at Canterbury Christ Church University. I would like to invite you to take part in a doctoral study looking at women's experiences of living through unsuccessful conception attempts. Before you decide it is important that you understand why the research is being done and what it would involve for you.

Part 1 tells you the purpose of this study and what will happen to you if you take part.
Part 2 gives you more detailed information about the conduct of the study.

Part 1 of the Information Sheet

What is the purpose of the study?

This study aims to gather knowledge of women's experiences of living through their difficulties with conception. I am particularly interested in understanding how women continue to live their lives whilst experiencing difficulties conceiving.

So far studies have focused on identifying the impact of ongoing fertility problem on women's wellbeing. However, more information is needed regarding women's ability to adapt to and cope with this difficulty. It is hoped that increased understanding of women's experiences with ongoing fertility problems will contribute to the therapeutic support provided for those struggling with infertility.

Why have I been invited?

You have been invited to take part in this study as you have identified yourself as having difficulties conceiving.

I am interested in hearing about your experience of getting through unsuccessful conception attempts (or fertility treatments). The outcomes of the study will be based on personal stories told by about 10 women who have experienced ongoing fertility difficulties.

Do I have to take part?

It is up to you to decide to join the study. If you agree to take part, I will ask you to sign a consent form. You are free to withdraw at any time, without giving a reason.

What will happen to me if I take part?

You will be asked to talk with me about your experience of living through unsuccessful conception attempts. This can be done in person, over the phone or via Skype. I will ask you some questions about your experience of living and managing your fertility difficulties to get a full understanding of your experience. However, it is up to you how much of your experience you want to share.

The interview is planned to go on for about an hour. However, the session may be shortened or extended depending on how much you want to share. You are under no obligation to take part for the full duration as specified above.

The interview will be recorded on an audio recorder (or electronic device if interviewed over Skype). The recording will then be transferred to a password protected memory stick and kept

in the researcher's possession for the duration of the study. At the end of the study, the recording will be transferred to a password protected CD and kept in a locked cabinet at Canterbury Christ Church University for the duration of 10 years, after which it will be destroyed.
You will be asked to answer questions regarding your age, ethnicity and fertility experience. However, no confidential information (i.e. name) will be used for the purpose of the study.

Expenses and payments
You will be given £10 for your participation in this research.

What will I have to do?
You will be asked to talk about your experience of living with ongoing fertility difficulties. It is up to you how much you share during the interview. I may ask you follow-up questions (such as "Tell me more?") to get a full understanding of your story. However, you are under no obligation to answer all questions put to you.

What are the possible disadvantages and risks of taking part?
This research involves discussing a topic that most women find closely personal. Therefore, it is possible that some of the topics raised during the interview may cause you a certain level of discomfort or distress. Please feel free to say, if there is anything you do not wish to talk about. The interview can be brought to an end at any point should you wish to do so.

What are the possible benefits of taking part?
We cannot promise the study will help you but the information we get from this study will help improve the psychological treatment of women with ongoing fertility difficulties.

What if there is a problem?
Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in the study be kept confidential?
Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

<u>Part 2 of the information sheet</u>
What will happen if I don't want to carry on with the study?
You have the right to end your participation with the study at any point.

If you have already begun the interview, you will be asked whether you are happy for the information you have disclosed to be used for the purpose of the research. We would like to use the data collected up to your withdrawal. However, you have the right to decline this. The recording will be deleted from the audio recorder in your presence, should you decline to share the information you have disclosed.

What if there is a problem?
Complaints

If you have a concern about any aspect of this study, you should ask to speak to me and I will do my best to answer your questions. (Please refer to my contact details at the bottom of this information sheet). If you remain unhappy and wish to complain formally, you can do so by contacting Professor Paul Camic (Research Director at Canterbury Christ Church University) on 03330117114.

Will my taking part in this study be kept confidential?
All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which has your name and address will be removed so that you cannot be recognised.

What will happen to the results of the research study?
The results of the study are intended to be published. Anonymised quotes from your interview may be used in the publication. However, no identifiable information will be disclosed.

You are welcome to request a summary of the findings at the end of the study. (Please contact me on the number/email provided at the end of this information sheet).

Who is organising and funding the research?
This research is organised and funded by Canterbury Christ Church University. This study is in pursuance of a doctoral degree.

Who has reviewed the study?
This study has been reviewed and given favourable opinion by Canterbury Christ Church University Research Ethics Committee.

You will be given a copy of a signed consent form to keep.

Further information and contact details
If you would like to speak to me and find out more about the study or have questions about it answered, you can leave a message for me on a 24-hour voicemail phone line at 03330117070. Please say that the message is for me [Anna Bailey] and leave a contact number so that I can get back to you.

You may wish to seek further information and support regarding any of the issues raised during the interview. Please see the attached document for information about local counselling services.

Alternatively, you may wish to visit the Infertility Network UK (www.infertilitynetwork.uk) for support and information regarding infertility difficulties.

Appendix H - Consent Form

CONSENT FORM

Women's experiences of living through unsuccessful conception attempts

Name of Researcher: Anna Bailey

Please initial box

1. I confirm that I have read and understand the information sheet dated..... for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐

3. I agree that anonymous quotes from my interview may be used in published reports of the study findings ☐

4. I understand the interview will be audio recorded and the recording will be kept in the researcher's possession for the duration of the study. ☐

5. I understand the recording may be given to an external transcriber for transcription. Transcribers will preserve confidentiality and will not share the recording with anyone other than the researcher. ☐

6. I agree to take part in the above study. ☐

Name of Participant_____ Date_____

Signature _____

Name of Person taking consent _____ Date_____

Signature _____

Appendix I - Debrief Form

Women's experiences of living through unsuccessful conception attempts

Thank you for taking part in this study.

The aim of this research is to increase our understanding of how women live through their experience of unsuccessful conception attempts.

So far research has focused on exploring the emotional impact of fertility difficulties. The findings of such studies indicate that women who struggle to conceive report greater emotional difficulties, such as anxiety and depression, than those without fertility difficulties. Yet there is no difference in the prevalence of significant mental health difficulties between women who are (or have been) pregnant and those who struggle to conceive. This suggests that women who are unable to conceive are able to adapt to this period in their life, without it significantly impacting on their mental health. However, the process through which women are able to do this is currently unclear.

The finding of this research will contribute to our understanding of the process women go through to adapt to their difficulties of becoming pregnant.

It is hoped that greater understanding of this process will improve the psychological input for women accessing psychological services for difficulties associated with their experience of infertility.

If you have any questions about this research, please contact me. If you have any complaints I will attempt to address these. If you remain unsatisfied, you may wish to contact Professor Paul Camic (Research Director, Salomons Centre for Applied Psychology, Canterbury Christ Church University), Tel. 03330117114, email paul.camic@canterbury.ac.uk

Thank you for your participation,

Anna Bailey

Trainee Clinical Psychologist
Salomons Centre for Applied Psychology

Information regarding sources of support

Online sources

http://www.infertilitynetworkuk.com/

http://www.fertilityfriends.co.uk/forum/index.php

http://www.infertilitynetworkuk.com/more_to_life/support_6

Support groups

[Note: Information about local support groups was included for each participant individually]

Facebook

There are plenty of groups on Facebook dedicated to sharing information about fertility problems. They provide space for people to share their story and to support one another.

Some examples are:

Infertility Inspirations

Infertility Support Group

Infertility TTC Support Group

Infertility Awareness and Support Group

Mental Health Services

Please speak with your GP if you feel you would benefit from talking to a trained professional about your difficulties. They should be able to refer you to the nearest psychology service.

Alternatively, please see the following directory for a list of private therapists in your area.

http://www.counselling-directory.org.uk/

Appendix J - Interview Guide

Introductory Questions: Background/context

1. Can you tell me a bit about yourself? What is your occupation? Do you have any children? Partner?

Experience of infertility

2. When did you realise you had difficulties becoming pregnant? How did you become aware of this?

3. Tell me about your everyday life with being unable to conceive?
   Prompt: Frequency of thinking about children/infertility; how is that for you?

Coping/ resilience

4. Reflect of answer from Q. 3 (i.e. "From what you are saying it sounds that your experience of trying to conceive has been difficult for you")

   a. **Experience describe as difficult/challenging/stressful:** Is there anything that helps/helped you through the difficult days?
      Prompt: friends; family; work; the way you think about it; internet forums

   b. **Experience not described as difficult/challenging/stressful:** What do you make of that? (Some women find it difficult. What do you think is different in your experience?)

5. In what ways does/do (the above mentioned) help?
   Prompt: Why do they help? How does it make you feel? What would it be like not to have them?

6. How have you dealt with unsuccessful attempts of conceiving?

7. Looking back on your previous conception attempts, how do you feel now about trying to conceive?
   a. Follow up by reflection: "It sounds like it is more difficult now than it was in the past" OR "It sounds like you are as keen to try to become pregnant now as you were in the past"

Concluding questions

8. What helps you carry on with your attempts to conceive?

9. What do you find helps you through difficult times in life?

General prompts: Can you tell me more? Can you give me an example? What do you make of that? How does that impact on you?

Appendix K - Complete Coding of an Interview Transcript

This has been removed from the electronic copy.

Appendix L - Table of the Progression of Category Development

Categories	Sub-categories	Focused codes	Quotes
Being the disempowered patient	Feeling vulnerable	Sensitive to reactions	so you just kind of think I may have been a little bit too paranoid and sensitive as well (P.2)
		Feeling vulnerable/ powerless	you feel vulnerable that somebody's telling you all these bad things and you can't say anything (P.1)
		Noticing judgement/ feeling judged	it's everywhere, in the media you're told, that's it once you hit 35 your fertility falls off a cliff, everyone is so judgemental about IVF you've only got to read online newspapers and look at the comments about IVF people say not it's god's way, why don't you just adopt. And it's just so hard to be think that so many people judge you and yet they have no idea what it's like to be in your shoes (P.3)
	Being the unknowledgeable patient	Feeling unprepared	the first time around I wasn't prepared at all I wasn't…I didn't know what's involve…I was not even I did not even know the way I would feel about it (P.1)
		Lacking knowledge	I suppose as far as the IVF goes, I am very new to it, I am with, when it comes to infertility treatment and investigations and ongoing issues, I feel like I'm an old hand, because I've been through it for a long time now, but with IVF, it's not something that I am familiar with (P.9)
		Following the professionals/ giving yourself over to them	when it comes to your own health, you seem to go to the GP and just trust everything they say. And it's the same with the consultants so if you go in, and you know nothing yourself about infertility you just trust, you just hope (P. 5)
Experiencing despair/distress	Experiencing emotional pain	Grieving the loss	I'd say it is a grieving process. Erm to me the embryos were babies even though their one in a million babies but they're my babies and it's the nearest I've ever gotten to being pregnant (P.2)
		Feeling negative	I think I got quite despondent after the Clomid didn't work, because you set yourself up and you think it's going to work, and then it doesn't. I think you can become a bit despondent and wonder if it's going to happen for you. (p.10)
		Judging yourself	I still have the days, I still have the days where I feel sorry for myself because it's not happened, I still have days where I feel sorry for my husband because it's not happened because it's something he wants as much as I do and I feel like it's my pressure, because I am the problem (P.9)
	Feeling stuck	Feeling stuck	And of course there is nothing the gynaecologist can do for me until I lose the weight so I am kind of stuck in the limbo (p.4)

		Facing barrier to treatment	When, while we were waiting to know whether the vasectomy reversal was successful or not, of course that was a few weeks and but erm but you couldn't have another IVF for 3 months ok, erm so yes, so we were waiting for that. (p.5)
		Waiting during treatment	Yeah and then you have it done and there is another wait to see if its worked or not and then it hasn't worked, then there's' another wait to start your period and you know it's just ever ever waiting (p.8)
Appraising ability & intent to carry on	Assessing and investing resources	Weighing up own resources	again it's never ever about the money, because if it works, it's worth all the money in the world (P.2)
		Deciding where to invest resources	Yeah therapy, I haven't tried it. They always give me a leaflet and you know go.. but then I look at the price and it's 80 pounds per hour and I go "oh ok" yeah… [.....] So I start, if I think of it going towards the IVF that costs you know thousands and then you think sort of ok, I am going to be fine you know with my cough medication (P.1)
		Investing resources	I'm so pleased now that I invested my money properly erm and bought houses because now I can cash in on that house, yes, I lose my pension, but who cares you know, I am young enough at 42 to start building it up again but you know, you can lose your entire livelihood and your future then. (P.5)
	Considering own position (Do I want to continue?)	Approaching the end	I do know I am coming to the state where I am "enough is enough now it's time to move on from us trying to fall pregnant through IVF" (p.5)
		Asked about stopping	people say to you "when will you stop" (P.3)
		Appraising past attempt/ future chances	Yes, we've had 3 IVFs now but only one failure but if we'd have 3 IVFS and 3 failures then that's a different thing isn't it but at the moment it's positive for me because I haven't had to face any more failure. (P.5)
		Knowing your limit (emotional/practical)	For me, the IVF drugs make my endo/ adeno flare up painfully and it is extremely stressful on my body.... that's on top of the huge grief I feel when it fails. I need to know I won't still be doing this in three or four years and that I can begin plans for adoption (P.11)
	Experiencing ambivalence	Ambivalent about ending	yeah I do think, sometimes I do have moments of "right this is going to be my final go" and about half an hour later it will be like "oh no because the fourth go could be the time that works if the third time doesn't work" (P. 2)
		Ambivalent about treatment	It wavers, sometimes I am really really positive and then other times I think, oh my goodness will it work (P.3)

		Varying motivation	last month I was like unbelievably laid back, I don't even think I took an ovulation test, to be honest. [....] But then there's some months there where I'm like, you know, I'm waking up my partner at midnight like, you know, going 'it's today. Come on!' (P.7)
		Experiencing set backs	I am like I said earlier in a limbo or in a loop cause you lose a bit of weight then you think well I've lost a bit of weight now let's do a pregnancy test and nothing, and it does set you back a bit. (P.4)
	Being aware of likely outcome/ future	Being realistic about pregnancy	I knew what to expect, I think I was in myself much better prepared going into it, probably more relaxed because I thought it would fail but umm, I didn't do any of those things because I thought it would fail. Which is why I booked a holiday, not like saved the money because we were going to have a baby! That would have been the sensible option! (P.6)
		Viewing future as possibly childless	it does bring home to you the fact that maybe you never will be a mum (P.2)
		Concerned about following mother's path	My mum went through the menopause quite early, she was 38 when it started, so that is a really big concern for me obviously. in case I follow the same path (P.2)
	Addicted to idea of pregnancy	Addicted to the possibility of pregnancy	it's also addictive because you think maybe next time maybe next time, it's like gambling your gambling on your health actually, you think next time, next time. (P.1)
		Obsessing/ preoccupied by fertility and own body	I would say it is quite obsessive to be honest, because any little symptom you think "ooh is that a pregnancy symptom" or "oooh should I do a test now, it does get quite obsessive in my opinion. You're always thinking ooh is this the month I've caught or should I do a test today it does, yeah I would say it does get quite obsessive for me (P.4)
		Wanting to have what others have	You know every woman, every pregnancy is to be celebrated and I would never take anything away from any of my friends for being pregnant but obviously when you've got that yearning in your heart, you have that "ooh I wish it was me" (P.2)
		Obsessing/ preoccupied with finding answers	I think I've got to get a limit on it, because I think I can let it get out of control sometimes and do too much research (P.10)
	Feeling time is running out	Feeling time is against you	I think because it is my age as well I just sort of see it as a clock ticking. I've got this sort of mental image of this clock ticking by and things like happening and time running out on me so I think I'm just a little bit more kind of yeah cause I am turning 36 I guess as well, it's kind of bringing it home that I'm over my mind thirties now and I really have to crack on with it. (P.8)

		Feeling like time was wasted	Oh we've been through every system you can imagine yes, and a lot of a lot of misinformation and a lot of time wasted actually considering. You know at my age…you know a lot of time wasted. And you can't turn the clock back I know that (P.5)
Doing "something" (focusing on the goal)	Doing "something"/ moving forward	Moving forward to/away from	But then you need to keep going otherwise you're never going to get there you're never going to know if you're gonna catch or not (P.4)
		Doing "something"/ being pro-active	Maybe there's different vitamins you can try or different herbs or you're going to try an exercise regime or yoga or something like that, which might make some difference to your body, your health (P.11)
		Unable to relax	I think once I've gone through that and lost the weight and gone on to the next step, I may relax a little and think ok I have tried that and without trying it I would still be thinking what if (P.4)
		Persevering with treatment	I think we are always going to keep going (P.10)
		Internally driven	I don't know it's just this inner feeling that in a way you know you need one more and something is pushing you through I don't know what it is (P.1)
	Prioritising treatment	Prioritising treatment	I mean personally we had probably a good 12 months where we put everything on hold, we didn't have holidays, we wanted to move house we decided not to do it because of the what if (P.9)
		Minimizing non-fertility issues	infertility takes so much over that other things don't seem like problems any more, in a way. (P.1)
		Adjusting life to infertility/ treatment	So again it's about waiting month to month to see if something will work and see if you can restart your life as a normal person and in the meantime it's all about the treatments (P.8)
	Clutching at straws	Seeking non-evidence based/ alternative treatment	Well my acupuncturist was a fertility – she specialised in infertility and she was very knowledgeable, but she looked at it from a very holistic point of view, so it was nice to have the mixture between the doctor at the hospital, who is very much very medical, and then the acupuncturist who was very sort of holistic and she gave me a different viewpoint for looking at things. (P.10)
		Searching for miracles	seeing if there is anything that different, you know all those knew wonder drugs (P.2)
		Clutching at straws	you get that desperate you clutch at straws and you're "right I'm gonna do that next" or I'll try that (P.2)

Nurturing own strength	Recognizing/ nurturing own strength	Past experience of adversity	I have a lot of support from my husband, we've been together for a long time since I was 18 we've been together and obviously naturally in that space of time, things are going to happen and you know, life isn't always sunshine and roses (P.9)
		Recognising own (& couple) strength	I think like I said earlier, it's about supporting my husband and making sure he's ok. I know I have to look out for somebody else I'm quite a resilient person. (P.8)
		using own resources/ helping yourself	I think it's ok to rely on somebody else, to a certain degree, but at the same time you can't constantly rely on other people, you know, you have to kind of find your inner strength yourself, because it will help you an awful lot (P.7)
		Nurturing own strength	I suppose because I don't want to go back there, like it was a horrible 6 years like, and I don't want to end up where I was then so I am trying to keep it at a level that I find comfortable but I think about it sometimes when I feel it is alright to it and then days when I am not feeling so great then I definitely don't think about it (P.6)
		Reverting to known coping strategies/what worked	Yes, it does probably because I am a doer so erm anything generally you know in business or you know you make mistakes or something like that or you regret doing somethings I just move on a look at it positive and learn from it. SO this is ongoing with the IVF, I am looking, learning, asking questions, I'm still learning erm but erm yeah I'd say that is what I do in life (P.5)
		Safeguarding own vulnerability/ feeling safe	Well you feel safe because its closed you feel like you are in a group hmhm, because it's not, you're not posting online hmhm to the world. You are posting in a closed situation and nobody knows you in there, so you feel safe saying things and you know you can discuss the bad behaviour of clinics anything, you can discuss anything (p.5)
		Recognizing risks for wellbeing (physical/mental)	And try not to let it take over, because mentally I've like, I've obviously been in a dark place before when I first, you know, started getting pain and stuff in my stomach. I don't want to go back there again. Do you know? So you kind of just, just fight it off and try not to think about it (P.7)
		Getting to know yourself/own behaviour	Yeah, I think I know myself a little bit too well. I have given myself some counselling! (P.6)
		Letting go of shame/judgement	So there has to be a degree of acceptance over my body doesn't work the way it was perhaps designed to, and I have a kind of disease, I suppose, where it's not working the way it should and, I guess, it's ok. (P.11)
	Preparing for pitfalls	Anticipating challenges	You're emotionally, you are prepared that there is going to be this time when I am going to be very down and for example we are doing it next month so I know that next month as soon as I start the medication I am going to be feeling down (P.1)

		Preparing for failure	I think my problem would be if I go, if I get to the stage of IVF and that doesn't work, it's kind of the end of the journey on one hand unless I pay for further treatment, which at the moment it's not something we can do with a mortgage (P.4)
		Aware of "scare" stories	there is no reason to say it would happen to you but you do find yourself being drawn to the awful stories (P.3)
	Establishing a supportive & accepting environment	Distancing from others	you feel like if I go out I will just want to sit there and be depressive and nobody will want to talk to me, so you don't really want to go. So you kind of end up staying in all the time, you sit in front of the TV which isn't great but it's kind of life on the 'Infertility Street' I guess (P.8)
		Nurturing/developing relationships	Like when I first started to go for fertility treatment, I actually found out that my best friend was pregnant, and that actually brought us a lot closer. (P.7)
		Drawing on offered support (practically/ emotionally)	Well just some guidance, not necessarily the answers because there's not always. Ok, so that's kind of your natural way of getting through difficulties is looking for guidance. (P.9)
		Sharing the experience	when we find new treatment he is as interested in it as me, he wants to find out more as well erm and its a journey, we're on it together we can't do it any other way (P.3)
		Rejecting support	that is what people used to say to me like, "oh just relax and it will happen", that is not what you want to hear. (P.6)
		Feeling supported/ reassured/connected	I've always either spoke to somebody around me that I know will give me some, just listen to me and then reassure me that either, not necessarily even reassure me that things are going to be ok, cause I don't think people can, but they've given me that morale boost and put me back into my mental happy positive state (P.9)
		Lacking support/ reassurance	I think how a woman feels during infertility is undoubtedly linked erm to how they are treated and the entire system as well... erm and this erm lack of support comes through with it so you know if you're feeling the lowest of the low, and there's no one to turn to, the clinics don't want to know (P.5)
		Disconnecting from children/ pregnancy	've felt as though I haven't wanted to be in the same environment as my sister-in-law, especially when she was late pregnancy and just recently when the baby's been born, because I've found it quite difficult to be around her (P.10)
		Open about self/ infertility	now I am openly saying it you know I am going through infertility I am on hormones so, that's what's wrong with me (P.1)
Taking control (of treatment/		Accepting past decisions	you start wondering "why I didn't check it before, why didn't I do..." you know these why, why why that always come, but then you always sort of accept them (P.1)

infertility experience)	Learning from the past/ not wanting regrets	Satisfied with past decision	Yes, definitely, definitely it was the best thing I ever did (p.2)
		Having regrets/ thinking what could have been done differently	I wished that I know about that before, because when I was in my really really bad days I couldn't have gone in there and they would have been supportive (P.5)
		Not wanting regrets	we can't afford to look back in years to come and think we should have tried that, we should have done one more set, we should have done something different (P.3)
	Wanting & finding control	Yearning for certainty	I like to know what the next step otherwise in my head I would be going what if, what if I didn't go to that doctors I wouldn't have known what's going on now (P.4)
		Lacking control	I think it's the unexpected as well, isn't it, not knowing the outcome. I suppose that's links in to lack of control (P.10)
		Being in control	you can really say to the doctor, I've read about this can I try this, I want to do it this way and the doctor more often than not will say yes you can do that. So you can be in control of your own treatment (P.3)
		Having consistency	It's the consistency it's knowing that there's always somebody there that's going to help you and somebody that's just going to give you a hug if you need it (P.9)
	Becoming an expert through experience	Feeling prepared	Just so that I'm... because it is now something new for me so before I go to speak to my consultant before they put protocol together I know a bit more about what's involved and what each medication does to you and what side-effects and... so that I am prepared (P.1)
		Knowing what to expect	You get used to the being in the loop of the fertility, it's like you know what's going to happen (P.4)
		Becoming knowledgeable	it makes me feel like I've got some kind of knowledge and sort of knowledgeable, so I understand what the doctors are saying to me as well, and I understand my actions (P.10)
		Learning through experience	then I suppose I just got slowly into it and as each cycle failed I found a bit more and my knowledge has expanded (P.3)
		Becoming an expert/researcher	Well I like to feel that I've researched, but I think that has its advantages and disadvantages (laugh). I don't know. I like to look in to things and get lots of knowledge on my condition and things like that. So I do feel that helps in the sense that I've got a good knowledge of my condition and treatments and things (P.10)
		Questioning treatment / decisions	I said "did we do the right thing by putting back two?" I said "it was our last you know chance and on the NHS and that alone we may have decided that was our last try. And I said "And you didn't want" I said "did we do the right choice?" (P.1)

		Educating self	the first time I had the collection done and the transfer I didn't know what to expect so it was nice to go on [the internet] (P.2)
		Becoming an advocate/ adviser	That's it, yeah to try and help other people with it because we've had such an awful time with it and not getting any help from places then I don't want anyone else to go through what we went through because it's been awful (P.3)
		Making own treatment decisions	I should take 4 50s IEUs a day but I didn't, I just lowered the dose myself, and I know that probably I shouldn't have but done that, but no I'm not doing it, I'm not doing that to my body so I only injected only 350 which saved me money as well off the drugs and erm there was a better result (P.5)
		Powerless professionals	No because the doctors can get as far as putting the embryo back in your womb, but they cannot make the embryo to implant which is out of any doctor's hands (P.1)
		Getting medicalised information	my clinic will give you...throw everything at you at the science wise what can happen but when it comes to vitamins, supplements, dietary there's not a lot there, they often say nothing what so every in the way of that (P.2)
	Making/ having a plan	Not thinking too far ahead	I think that will be the issue, once I've gone through all the stages that the NHS can offer I think that's' going to be…but then I think I'm thinking too far ahead there that's my problem I need to just think right now (P.4)
		Having a plan	I want to take each step as it comes but I don't even know what I would say, or feel or think if I didn't have a plan. (P.5)
		Having more than one option	I think it gives you more hope that…if that drug doesn't work you can go onto another one and so on I think it is more, it can give you a bit more reassurance "ok that drug might not work, but this might work". That there is more help out there than just your body basically just trying to conceive. (P.4)
		Focusing on the next step	I do think, having a plan of action for what you're gonna do next helps because it gives you something else to concentrate on other than what just happened (P.2)
		Preparing for next cycle	I think that's the only thing that can pull you through is the next... moving onto the next thing (P.8)
Holding onto hope/optimism	Keeping 'child future' in mind	Wistful about family life/ pregnancy	I don't know other just seem to they complain about their children and how hard it is for them, whereas I'd give anything to have those problems (P.3)
		Finding someone to nurture	some people take puppy, something, some go excessively on their sibling or their husbands or their other…I have a friend I can take her children out and enjoy...but if I want to buy something I buy for her children, you do need something. (P.1)

		Having future/unborn child in mind	Yeah just having, having your own baby in your own arms I think that just keeps you going. (P.2)
		Desiring own child	I would joke before the IVF, well if I can't have babies I will have a tortoise sanctuary, honestly because I have a tortoise and there are a lot of tortoises out there needing homes erm you know, that is not what I would say now. I want that child. (P.5)
	Searching for/finding similarities	Searching for shared experience/ finding shared experience	Yeah, I think hearing…half of the time it might resolve some issues. Obviously everyone goes to different doctors everyone has different fertility issues you might think "actually, ooh I think I'm having same symptoms as you are, perhaps I'll have a word with my doctor mention that and the doctor might say "yeah that could be it" and they might try you on that treatment it could well work. (P.4)
		Acknowledging similarities	I would say that's pretty much every woman whose going through fertility would be going through the same (P.2)
		Comparing self to other women/couples	I think that's probably the danger with my friend as well really, because her situation's obviously very different to my situation. But you do, yeah you do compare. (P.10)
	Keeping a positive frame of mind	Being optimistic/ positive about success	I still feel like I am still at the early stages and this is just the first try that…yeah I don't really know how to word it but it's not, I kind of feel as though if it doesn't work this time, it's not the end of the world. Because it's only the first go. I'm not saying, it'll be any less difficult on the day that you learn it hasn't worked, it would still be horrible, because you, you know how much you think about it and trying to remain positive but because iot is just cycle one I think that there's always something you can learn from it if it doesn't work. (P.9)
		Noticing achievements	I don't think they realise every stage that you get to you've done very well to get to that stage (P.2)
		Holding onto hope	Just the thought of it actually working someday. Do know that, you know, any month could be the month. So that, you know, that's a big motivator like to keep going that, you know, it could happen at any time really. (P.7)
		Finding/holding onto inspiration	there's this saying a quote whatever and I tell this to anybody going through IVF because I said it's so true I can't remember who said it but is "courage does not always roar, sometimes it is the little voice at the end of the day saying I will try tomorrow." And that just sums it up perfectly (P.3)
		Using humour	you find that you are not alone struggling with something and that somebody can laugh about it (P.1)

		Looking to success stories	they'd been through IVF and it had worked. So that was really helpful because you felt 'oh, if it can work for them it can work for me eventually' (P.10)
		Optimistic about the future	Yes, and that's it and we have said if the worst comes to worst and we don't have children. We're still going to have a lovely life it's just going to be very different. (P.3)
		Knowing future won't be childless	it is a comfort to know that our life, even if we don't conceive and have our own child, like biologically, there is still the option that we could bring up a child help towards its development (P.9)
	Seeing the bigger picture	Acknowledging other's struggles	what's surprised me is that how …I never thought of this whole process as being difficult on the man and I guess that's one of my key learning is that it's just as hard on the man as it is on the woman (P.8)
		Seeing the bigger picture/context of problem	in that sense everything else pales in significance so there's starving people we're working with in Greece for instance, you know you think of them (P.5)
		Noticing the positives	It just makes me feel lucky that I've got him, cause a lot of people haven't got anybody else and ok things might be bad for us in terms of we haven't got children yet but there is still a lot of positives about our life. (P.3)
		Appreciating own good fortune	I'm lucky enough to have all the help, you know, from the health system and stuff like that, that, you know, when I was living in Ireland I wouldn't be entitled to any of them (P.7)
		Trying to understand other's perspective	To each their own. If that's what they want to do. (P.2)
		Putting things into perspective	Definitely, rather than to focus on it so much and I think when I did do that I obviously didn't have a very good time, 6 years of horrendous time and so now I tend to yeah, weight it up and put it into perspective so that I don't end up back there I suppose. (P.6)
		Noticing others' (infertility) distress	I think I'm having the easier part where is he saying you know physically he's fine but there's nothing he can help you now he can't ovulate he can't take the medication for me all he can just be there that's all (P.1)
Reaching the limit	Exhausting resources (emotional/ practical/ health)	Reaching the emotional limit	We did after we finished the Clomid, because we sort of felt a bit exhausted after it really, and a bit despondent (P.10)
		Exhausting all possibilities	Once you stop at that, you stop at that. Then you know I have…ok I tried it I gave my best and that's all I can do (p.1)

		Experiencing emotional destruction	Sometimes like I do have a complete emotional breakdown. Like I'm not a complete rock (laugh), but I don't know. I just think that if you need to cry, cry about it (P.7)
	Feeling the strain of treatment	Physically impacted by treatment	Well at the start, it wasn't very good cause when they first did the HSG erm they started to put the tube in and I bled straight away, and it was 8 weeks of continuous bleeding (P.4)
		Being on an emotional roller-coaster	It really is a roller-coaster you can get up, you can be absolutely fine and then half an hour later, you're sobbing, absolutely sobbing your heart out. (P.2)
		Not coping	I don't think you definitely don't cope with it for the first couple of weeks (P.2)
	Losing yourself	Feeling medicated/ losing your healthy self	your thoughts go in different directions and you feel tired, and all of the sudden you don't understand, you know you think I am a healthy person and all of the sudden I can't wake up in the morning it's just because of your medication, you're so medicated (P.1)
		Not feeling like "me" anymore	Erm its very difficult to kind of find yourself in that kind of a week long period when you are not on a cycles, you know when you have only that time in the month when you can be you and do the things you like doing its really difficult to redefine yourself in that way, erm I mean I haven't had a drink since august which all of my friends come around or come for a barbeque in the summer and stuff like that (P.8)
		Not recognizing self	You just want your life again, you just want to be you. I don't sometimes recognize myself anymore (P.2)
		Changing yourself to achieve a higher goal	I haven't become boring, I've become a woman that's desperate to start a family (P.2)
Re-connecting with yourself	Focusing on yourself	Putting yourself first/focusing on yourself	I pulled myself out and thought you know sod it, sod them, I don't care, I've got to think of myself. Erm and so I went to the wedding and I just got completely drunk and erm I haven't had a drink for months you know, where as I got completely drunk alright, and I thought right fine. (p.5)
		Expressing yourself	I think just getting it out, even though it may not make sense to the person you are speaking to erm, I don't like bottling things up, so whenever I do have a problem I do like to speak about it (P.2)
		Externalising/expressing anger	So you need to take this anger somewhere out. (P.1)
	Taking a break	Taking a break	I think it's worth bearing in mind that I kind of have had a break from it over the last couple of months because I've been forced to erm so I do feel not necessarily in a better place but I

			do feel more positive about things then probably what I would have at the end of a stressful period of medication and appointment (P.9)
		Letting go/relaxing	I've had acupuncture and I've had reflexology and I've enjoyed them both, not necessarily because I felt they were helpful in terms of my physical health, but they helped me mentally relax (P.10)
	Connecting with your "normal" life	Having a non-fertility life/finding distractions	I started doing yoga, I started doing signing, and it's just good because rather than spending hours trying to research my cure for myself, somehow, through sort of looking at stuff online, reading papers, whatever, I'm practising my singing (laugh) and practising my yoga, and I'm enjoying those things (P.11)
		Becoming "me" again	Then with about a month of two I think no I just was time out. I just want to be me and I just want to be me and I just want to get myself into a better place mentally (P.3)
		Assessing emotional impact	You need time to heal once you have had yourself that time instead of doing it back-to-back you sort of can, sit back and relax and think about "oh yeah it wasn't so bad actually (P.1)
		Not letting it take over	I don't like the thought of it, the thought of trying to conceive and the thought of the potential of not conceiving and it not working I don't want that to take over. I want to carry on having a normal life, and to not be consumed by the potential that I don't actual know what the future holds. (P.9)
		Reaching acceptance	You're not feeling like you're going to burst out crying every couple of minutes. You just feel a bit better with yourself probably you're a bit more at peace with yourself (P.2)
Coming back to treatment	Coming back to treatment	Coming back after relaxing for a bit	We have tried that as well going you know went to Egypt in September we went to visit other families and relatives around the world you now, yeah you do relax for some time but the you are back in with all of this. (P.1)
	Preparing for next cycle	Seeking counselling as preparation for next step	I'm actually thinking of going back to see her within the next couple of weeks just to, just before we start the ball rolling with the third go. (P.2)
		Preparing others for own emotional reaction	I am warning everybody around me "be prepared in the March, if I say something you know rude or offensive to you, please ignore me" or I could probably even put it on my Facebook status, so you are more prepared about what's coming (P.1)

Development of Core Categories

Core Categories	Categories
Appraisal	Experiencing despair/distress
	Appraising ability & intent to carry on
Building self up for next attempt	Doing "something" (focusing on the goal)
	Nurturing own strength
	Taking control (of treatment/infertility experience)
	Holding onto hope/optimism
Stepping away from treatment	Reaching the limit
	Re-connecting with yourself
	Coming back to treatment

Appendix M - Example Research Memos

Early memos- thoughts relating to what is emerging in the interviews

Two Week Wait

It seems that the participant followed the doctor's orders during the first two week wait - i.e. doctor was seen as the expert. "They give you a test date for a reason" (p. 1). However, when a positive pregnancy test was not achieved the participant become their own doctor-researching their own bodily reactions, consulting other "experts" on Google. In a way the participant appeared to take the matter into their own hands. However, this becomes obsessive (-not sure why it becomes obsessive). Perhaps because failure makes women hypervigilant of their own body- which drives their need to diagnose what is going on.

Witnessing procedure

Participant talks about needing husband to witness the procedure. The following quote strikes me as important: "You know when you moan "oh I don't want to have to take these vi*tamins" or "I could really do with a drink" well "hello my…your life just gets put on hold for maybe a few weeks mines literally been like this for the past three years" really.*" It almost seems that the participant is saying that the reality, sacrifices, and difficulties that she goes through go unnoticed until her husband witnesses the actual process-her actual physical pain/discomfort. I wonder if there is a direct link between seeing and understanding. Participant talked about this previously as well- when she said that she sends photos to her mother to show her what was involved.

Moving through grief

"You can't you can't live in it for ever otherwise it will eat you alive and you go through enough in my eyes, going down that road as well."

The following quote appears to depict the point at which the participant decided to move on. It almost appears that she became aware that the grief/disappointment/sadness was "eating her alive". I wonder whether it was this point which made her make the conscious decision to move on; plan the next move. She said that planning the next move helps move through the grief as it gives her something to focus on. I wonder whether this is as a way of disconnecting from the feelings (becoming more task oriented) or whether it is because it gives her hope.

Advanced memos- thoughts regarding emerging themes and focused codes

Moving forward

Participants talk about focusing on the next steps, moving forward in some way. Some of them talked about moving away from the "limbo", where they feel stuck and in a place where nothing is happening. Some see the "next step" as getting away from the pain of the last failed cycle. "Next step" seems to have a function of propelling women forward towards the wished for goal and away from the painful experience.

"Yearning for certainty" "being in control"

Participants seem to be searching for things they can control in their lives. Be it with fertility itself, through supplement taking (i.e. know that each day the same supplement will be taken, and that this is something they can control and be certain about). Or it might be when engaging in activities, they want consistency in their life (knowing the same people, knowing what to

expect). Some participants said that infertility is so uncertain and uncontrollable that they seek ways of getting this control back into their lives.

"Comparing self to others"

This is something that a lot of the women do. However, I am not sure what the function of this is. My initial thoughts are that it is women's way of finding someone in the "same boat" and feeling as though they are not alone (i.e. belong to a group). However, it might be that they do this in order to predict what might happen to them, learn about methods of achieving pregnancy, or prepare for failure (know what hasn't worked). I should ask about this in my next interview. See if the women find they think about other women, going through this and why they think they do that? When do they do that? I wonder if it is done more at the beginning (and has a more educative purpose, i.e. learn about what might happen) or later when things have failed and need to know they are not alone/different to other women?

Theoretical memos: memos regarding category integration

"Moving on", "reaching the limit" "exhausting all possibilities" & and "wanting to be 'me' again"

I wonder whether these categories are connected. When do participants feel ready to move on with their lives? I wonder if this is quite a linear relationship where participants exhaust their possibilities (and resources), thus reach their emotional/practical limit, and want to reconnect with themselves which makes them move on to a life which does not centre around infertility and treatment. Or is it in different order/cyclical? For example, do they exhaust possibilities, reach their limit, move on, until they perhaps replenish their resources, find new possibilities, which makes them try again? Now participants say they "move on" to think about something else other than infertility or treatment, but at what point do they reconsider treatment again? I should explore this link between "moving on" and "wanting to be 'me' again". Is there a link?

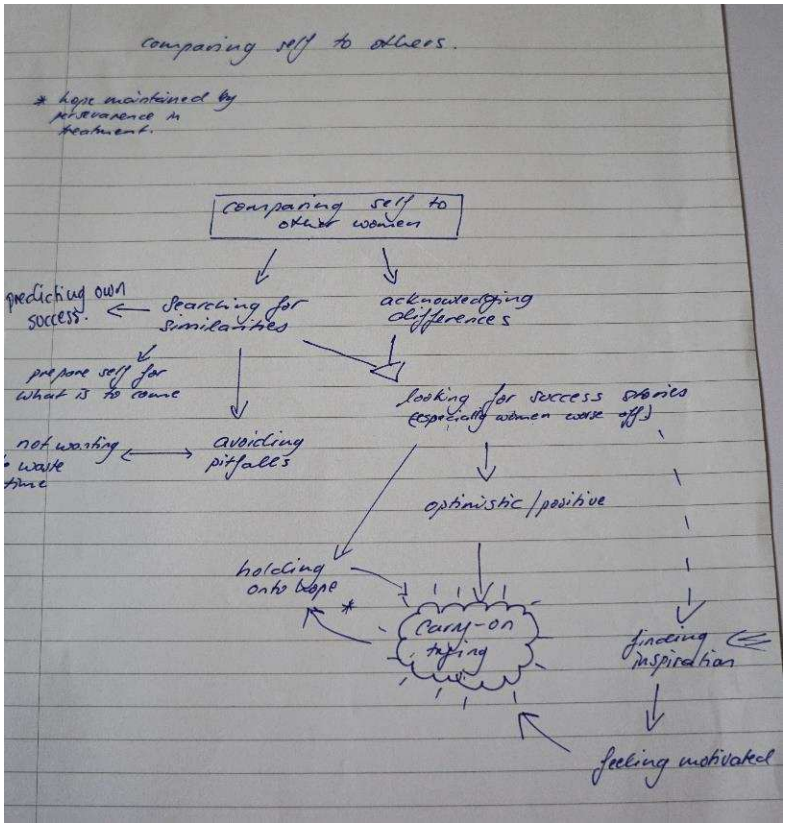
Preserving hope

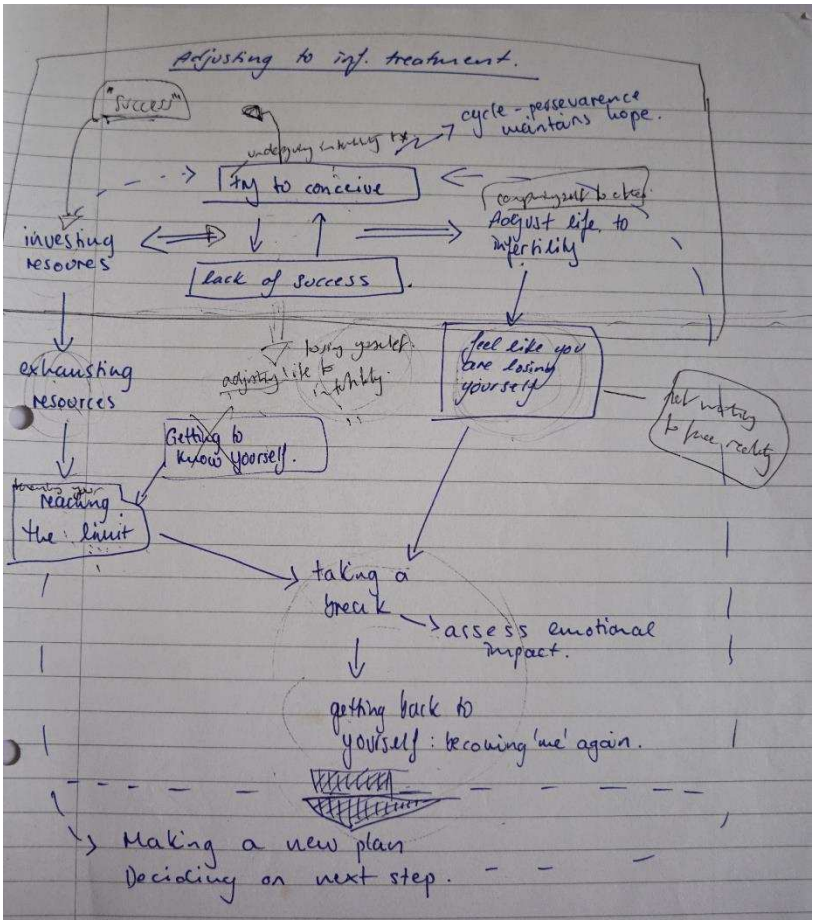
By carrying on with treatment attempts, plans of what to do next, participants acknowledge that there is still hope for them to conceive. I.e. they haven't given up yet, exhausted all possibilities. This appears to give them hope and optimism/motivation to continue with pursuing the next steps towards trying to achieve pregnancy. This hope appears to then feed into their efforts of working towards their goal of achieving pregnancy.

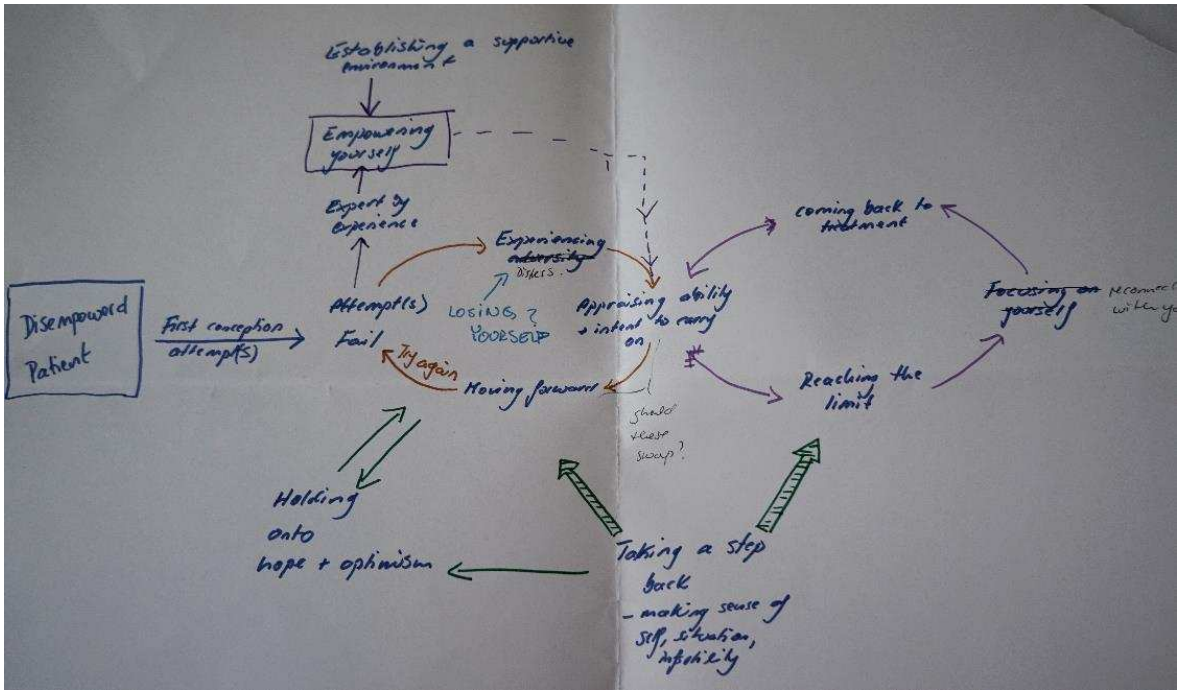
Exhausting resources and focusing on yourself

As I am looking at participant 5, there seems to be a clear link between her feeling that she is emotionally exhausted and then consciously making a decision to take a break. She says *"that* was the first time in a couple of months that I actually went to bed and cried and cried and *cried [……] I pulled myself out and thought you know sod it, sod them, I don't care, I've got to* think of myself. Erm and so I went to the wedding and I just got completely drunk and erm I *haven't had a drink for months you know, where as I got completely drunk alright, and I thought right fine."* She almost explicitly links these two events together, which just supports my initial thoughts that women invest so much into this whole process (which impacts on their emotional and physical health, as well as their relationships) and when their capacity to do so reaches the limit they feel they need to take a break. In a way do things that are completely counterproductive to their fertility goal, yet very much needed for them to connect with themselves again.

Appendix N - Examples of Initial Theoretical Models






Establishing a supportive environment
Empowering yourself
Expert by experience
Disempowered Patient
First conception attempt(s)
Attempt(s) Fail
Try again
Experiencing adversity
Others
LOSING YOURSELF
Appraising ability + intent on
Moving forward
coming back to
Focusing on yourself
Reaching the limit
Holding onto hope + optimism
Taking a step back
- making sense of
self, situation,
infinitely

Appendix O - Sections of Bracketing Interview

This has been removed from the electronic copy.

Appendix P - Abridged Research Diary

November 2013

The research fair was today. I was quite worried about it since I had no idea what I wanted to do. But somehow, something 'clicked' when Helen spoke about her research interests. The whole time I was trying to find something personally interesting, that I completely forgot about the fact that something that is personal is the fact that I am a woman in the 21st century that cannot necessarily have it all. I do worry though that everyone wants to be supervised by Helen. The search for a research supervisor seems to be so competitive!

December 2013

Helen said that she would be interested in supervising my project. However, we decided to take time to think about whether the topic of infertility/IVF/identity was not too personal and would allow me to approach it as objectively as possible. I think the issue of having children is not really currently on my mind so I think I can think about this. I really hope that Helen agrees to supervise this project.

February 2014

So my supervisors will change in the next upcoming months. I'm not sure how I feel about this. On one hand I am really excited for Helen but at the same time I worry what this will mean for our supervision when/if she comes back. However, Helen told me that Carla is interested in supervising my project. That's making me feel quite motivated about getting on with really starting the project now.

March 2014

I started working on my research proposal. It's quite interesting researching about infertility. But I am finding it quite difficult to organise my thoughts and find gaps in the literature. So much seems to have been done in this area. I really hate this stage of the research process! Finding what to do…Once I know what I want to research I just get on with it, but finding something to research which hasn't been done before is so difficult.

April 2014

The meeting with Helen was really helpful. Just going through my mind maps and discussing what I found had been done previously helped me to decide what to focus my research on. It seems that a lot of the research done within the field of infertility has focused on the psychological problems associated with infertility. However, there doesn't seem to be that much out there on what helps women get through the difficulties of not being able to conceive a child. Helen suggested that I perhaps focus my research on resilience. I also like the thought of spending the next three years on a project which focuses on positive psychology rather than on exploring the negative aspects of infertility.

May 2014

I am just writing a draft interview schedule for my MRP. As I am writing it I am becoming increasingly aware of how difficult it is to phrase questions sensitively. I find it difficult to use phrases such as "being infertile". Asking "what have you struggled with as a consequence of your infertility" sounds in a way better/more sensitive. I am avoiding the whole concept of infertility as a part of identity. "Being infertile" seems so…definite, different. Perhaps this just goes to show my personal attitudes towards infertility.

June 2014

The research proposal review was not really what I expected it to be. In a way, I was expecting to have my whole research idea pulled apart so was quite taken aback when I got asked just a few question about it. I did get little bit confused about one of their questions but I think I was able to give them a "coherent" answer in the end. But the whole process of having your work reviewed in person makes me really worried about the viva. I know it's still a long way away, but I am not quite sure how I will cope with people questioning my work.

July 2014

I finished updating my proposal. I'm quite surprised that it went through without any major concerns. Especially after hearing what others have said. I was a bit confused during the review when they asked about my "research aim". To be honest it is such a broad statement that it lost all meaning to me as well. Even though they didn't comment on it in the end, I considered changing it. If it doesn't make sense now, how will it make sense when I finish? But today I had another look at it and I think it does make sense. I just need to make the question broad enough to capture the different possible experiences that participants might have. So I can't ask "how do women adapt to their difficulties" because they might not. But they do continue to live their lives despite having fertility difficulties. So I can ask how they "live through the difficulties of achieving pregnancy".

September 2014

So I am working on my ethics form. There is so much paperwork involved with this project, and it hasn't even started yet. I can't believe I spent the whole year on just developing the idea for a project and getting it approved. I am not sure how I will actually be able to collect data, analyse it and produce some kind of report by April 2016.

November 2014

I received my ethics feedback. I'm bit disheartened that the rationale was not deemed to be strong enough. I suppose I have been so invested in this research, and it made complete sense in my mind for why it should be done, that this comment surprised me the most. I wonder whether I have minimised the psychological difficulties infertile women can experience. Maybe I was so focused on exploring resilience in this group of women that I overlooked that perhaps they are not resilient and struggle to adapt to their infertility. I wonder whether I am partly invested in the identity of a "strong, resilient" woman who can cope with adversity.

December 2014

I am finding it really difficult to sit down and rework my ethics form. I am especially stuck on reworking the rationale for the research. I know what I want to say...research has mainly focused on identifying the psychological impact of infertility on individual's wellbeing, but not explored ways in which they may be able to cope. That is why I referenced the study which points to no significant differences in psychopathology between control and infertile participants. I wanted to demonstrate that perhaps there are people who are able to cope with this and aren't negatively impacted by infertility. However, the more I think about it the more I wonder whether this is the case. It is not clear how the researchers define psychopathology in the first place as they argue that infertile individuals have higher levels of anxiety and depression.

January 2015

I started recruitment and have one participant lined up! It is quite exciting to start with my first participant. It's like a beginning of a story. I'm not sure what it will be about but I am excited to see how it will unfold. During my meeting with Carla we spoke about the need to consider where women are in their journey towards accepting infertility and ending treatment, and at the same time being aware that someone may not ever fully reach this point. It makes me wonder whether a woman who just started treatment copes with infertility differently than a woman who has been trying for years.

I keep thinking about my own personal experience with this topic. I try to separate myself from it but I know it won't be completely possible to do that. One of the email sent by one respondent said "I have been very vocal about this and have a lot to say". My immediate thought was 'how interesting, I wouldn't want to talk about it even with the people close to me'. It makes me wonder how much variability there will be in participant's accounts of what helps. But perhaps there might be something shared between those who want to talk about it and those who do not, and ways in which communication/silence helps.

February 2015

I interviewed my first participant! The conversation was so interesting. I can't believe we spoke for almost two hours! XXXX spoke a lot about her experience, which was great for me as I could just listen and pick up on any factors that she mentioned were helpful. I did find it difficult to know how much to step in or sit back. On the one hand I did not want to interrupt as I wanted an authentic account of her experience without imposing any judgements on it. However, I wonder whether a lot of the conversation was factual. On reflection I wonder how many "how" questions I asked. There were a few times during the interview where I thought "Yes, that is exactly the kind of information I want". How much did I then impose on her? How can you ever tread the line between wanting to get information that will answer your research question, yet letting the participant say their story?

March 2015

Second participant interview done! I can't believe how interesting it is to talk to women about their experiences. I am finding it quite liberating just being curious about their experiences without the pressure of feeling like I need to help (as I do in my therapy sessions). This interview took place over the phone. Interestingly I stuck much more to my questions than in the previous interview. I wonder whether it was because I could not read the nonverbal cues, and maybe filled the silences a bit more than I did in a face to face interview. There were a few times, when the participant was quiet. I was not sure whether that was because she needed to compose herself, her thoughts, or whether she just told me all that she wanted to and waited for the next questions. I was more aware of the need to think about the process (i.e. the context, pattern, and time) of what helps, rather than just asking about what was helpful. I think I asked "why is that helpful" more than in the first interview. It will be interesting to do another phone interview, to see how it compares to this one.

April 2015

Third participant interview done. During this interview I felt as though the participant wasn't talking about the psychological aspects as much as the previous participants. However, I wonder, did I bring that out in her? I am feeling a bit ill today so I am not sure my head was in it. At the beginning of the interview, I noticed that this participant's story was much more negative than the other participants so far. I felt unsure as to how to bring it out of the problem saturated story, at the same time I don't want to impose my question on the participants- i.e.

tell me what helps? What if nothing is helping? Maybe I need to stick more closely to their story, i.e. if they are in a job, how is that for them? How can they manage both? Do they manage both? Is that helpful/unhelpful? I think I always try to put my questions in both/and/or way to give participants space to disagree and elaborate.

My third participant suggested that I interview her friend who has a very different experience. That might be useful, since so far participants have said husbands have been supportive-what is it like when they are not? What if women have no support network? Perhaps, my next step should be to attempt to recruit participants who are going through this alone.

June 2015

Right, so I coded the text and ran it by Helen. It wasn't quite right….I'm really questioning my ability to do qualitative analysis. I really feel that it's a skill that hasn't been really taught very much and every book I look at does it slightly differently. Some use just two word codes, Charmaz focuses on more the action in what the participants say. Which I guess is what Helen had in mind. I'm struggling to find the time to meet with Carla as well. There's just so much to do and I really want to get going with the analysis and further data collection. In a way, I don't feel there's much I can ask Carla at the moment, but I must keep on top of this a bit more and make sure I use her expertise in the field.

……

I analysed the first data set again! After the meeting with Helen, I tried to follow her advice and stayed more close to the text, focused on the action/direction and context of the code. But at the same time I'm not sure I really got it. However, I came across a very helpful past MRP, where the trainee combined the methods described by both Charmaz and Strauss & Corbin. I think I do find the line-by-line coding and focused coding described by Charmaz helpful. However, I think Axial coding will be key in my analysis, to see how codes related to each other. I felt much calmer after looking at this MRP. I can see that I can use the methods more flexibly (as Charmaz said in her book).

……...

I started properly working on my literature review. So far, my thoughts are that I would like to explore coping in women experiencing fertility difficulties and going through assisted reproductive therapy (IVF, IUI). Previous literature searches focused on couples (Jordan & Revenson, 1999; and Ying, Wu & Loke, 2015). I would like to focus on women specifically. Even though fertility is often considered to be the "couple problem" and it does not affect only one person, research shows that women struggle more than men.

July 2015

I'm feeling much better after my supervision with Helen. She said the codes looked good, I think I'm now understanding what she meant by looking at the action in the codes. It was also very helpful to start talking about the emerging concepts. Particularly the difference between active and passive ways of coping in terms of seeking alternative methods, rather just having medical treatment done to you. There is also something there about sharing information, the way participants do this or don't do this, and who they decide to share information with.

This came up today in the interview, where the participant was talking about talking…There seem to be different ways of communicating –i.e. sharing the experience to perhaps get space for real empathy, or talking to people who give you immediate reassurance. I think this will be very important to explore as other participants spoke about it as well.

September 2015

I interviewed another participant today. This was a challenging one. I suppose I didn't get much sense of strength or resilience from this participant. The story that I was getting from her was very much "problem/stress" saturated. However, I found it interesting how she linked herself of being a researcher and a doer to how she responds to problems. She repeatedly said that 'if there is a problem, I fix it, read about it, deal with it, and move on'. Very much solution focused rather than emotion focused way of dealing with things.

Something I am finding difficult is to separate what I am reading about coping strategies in my literature review and my analysis. I am already picking up problem focused coping, avoidant coping, emotion focused coping. I need to make sure that I take the analysis further, not just to describe ways of coping but highlight at which stage, in what context, with which action participants cope (or in fact don't cope).

October 2015

I am just transcribing another interview. This participant seems to talk a lot about the theme of being an "expert" or becoming one. It seems that initially she didn't question the procedures and just let things happen to her- i.e. gave responsibility to the professionals. However, as she was met with a disappointment and became "well in her head" she started to question the decisions. I wonder whether this "expert" is closely linked to feeling in control, or more in power. As in, do women become experts to get control and power over the very uncontrollable/powerless situation they find themselves in? I should focus on that in my next interview. How do women find control/ certainty in their fertility journey?

……

There is so much to do with the literature review. I am regretting that I chose an area where there are so many articles to review. In a way 25 isn't that much, but I am finding it difficult to know how to present and synthesise the information. I want to have it all done by December, so that I can then start on my Section B. But at the moment I am not sure I will be able to do that. It just feels like so much work and I don't know how I will get it all done.

November 2015

Two more research interviews done! I'm very relieved that more women came forward. I was starting to worry that I wasn't going to get enough participants. The two women I interviewed were at very different ends of their fertility journey. One just starting, with the view of having IVF in the future, and one who had one successful IVF treatment and is now trying for a second baby naturally. Nevertheless, when asked about what helped them, they both spoke about "seeing the bigger picture" and "taking a step-back from treatment".

……

I decided to amend my ethics to get an external transcriber to transcribe my interviews. In a way, I feel like I am taking the easy way out (which I know is ridiculous) and I am missing out on the opportunity to really immerse myself in the data. However, I just feel at this point, it is not worth the stress and the time I could be spending on other parts of the project and on my personal life. I can't really expect myself to be of use to others on placement, if I am neglecting my own needs as well. I will just have to make sure I read and re-read the interviews when I get them back.

January 2016

I finished coding my 9th interview. It seems that not much new information has been coming up in the past 2 interviews and I only amended some of my categories. I wonder whether my codes are too broad that it allows for the participant experiences to be

incorporated. But in a way, I think this is exactly the point of focused coding. I feel that if I did more in vivo coding I would end up with too many low level codes that really mean the same thing.

One large category that has been coming up time and time again is that of becoming the expert. That is something which I was not expecting to come up in the analysis, and I am quite fascinated by the fact that most women (if not all) have described this process through which they entered the journey of fertility treatment and conception attempts generally unknowledgeable and gradually have become experts that question their doctors. This seems to be such a powerful shift for women to make and some have explicitly names the link between this and finding control in the whole process.

Another category that has been coming up is that of hope and positivity. I am aware that I came into this project wondering where women got there hope from and what role this played in their ability to persevere through the adversity of fertility treatments. I will have to re-listen to my bracketing interview to see what my initial thoughts were about hope to see if this is actually reflected in the interviews, or if it is just something that I am imposing on the data.

February 2016

I just finished interviewing my last participant. I say last, because I don't think there was anything new that hasn't come up from the other interviews. I will have to analyse it first though, to be completely sure. I feel like we had a good discussion about the model that I have developed, and it seems to have reflected this participant's experiences as well and how she had gone through her journey of trying to conceive. Something which came out clearly was the process of her stepping back from the treatment and taking time to reconnect with herself. I do feel reassured that the theoretical model that emerged from the data is depicting women's experiences through their fertility journey.

I think I need to have a re-listen to my bracketing interview to see what my initial thoughts about what might come out of the project were. I feel that throughout the analysis I've been focusing so much on what participants have said, that I no longer know exactly where their experiences and my preconceptions lie. I remember that I was quite pre-occupied with the topic of hope at the beginning, seeing that as something quite essential. And I think it did come out clearly in the data, and wasn't just driven by my questioning. But I can't really remember what else I thought might be the case. It might be just interesting to see whether my thoughts have shifted.

March 2016

I received feedback on my section B from both Helen and Carla. Their comments are really helpful, but I do wonder how much of it I can incorporate into what I already have. I am already over the word limit! It was really helpful to consider how I am presenting the results and to hear the feedback that it was not coming clearly across that I was looking at women who were undergoing fertility treatment. I will have to revise the write-up to make sure that this is clear. It's quite reassuring to see that I am being picked up on things I myself wasn't too sure about. It gave me the opportunity to make sure the results made sense to me in my own mind.

April 2016

I can't believe I am now at the stage where I am finishing off my thesis. Just re-reading my research diary makes me realise how much work went into this project. I still clearly

remember being at the research-fair in my first year and feeling stressed by not having any idea of what I wanted to base my research on. I'm really glad that I chose something that held my interest throughout (although the interest fluctuated at times). I'm also glad I chose something which I think has a lot of clinical relevance and importance. Just from talking to my participants, it seems that more research is needed in the area of infertility, particularly on what helps women get through this stage in their lives.

Appendix Q - Summary of Research for CCCU Ethics Board

Dear Canterbury Christ Church University ethics board,

Re: Living through repeated unsuccessful conception attempts: A grounded theory of resilience among women undergoing assisted reproductive treatment

I am writing to inform you that the above study has now been completed. Please see the attached document for a summary of the research findings. Please do not hesitate to contact me if you have any questions about the research or require further information.

Yours sincerely,

Anna Bailey
Trainee Clinical Psychologist

Research Summary- Ethics Board

Title: Living through repeated unsuccessful conception attempts: A grounded theory of resilience among women undergoing assisted reproductive treatment

Background information:

Infertility is a highly distressing experience for both men and women (Thorn, 2009). However, women report experiencing greater levels of distress than men (Greil, 1997). Up to date, research has focused on determining the impact of infertility on mental health and on exploring the psycho-social variables associated with psychological adaptation of women undergoing assisted reproductive therapies. Problem focused strategies, social support and wider life goals have been found to be linked to positive adjustment of women experiencing a failed IVF treatment (Terry & Hynes, 1998; Cassidy & Sintrovani, 2008; Verhaak, Smeenk, Nahuis, Kremer & Braat, 2007). Resilience has also been found to be associated with positive mental health outcomes (Sexton, Byrd & von Kluge 2010). However, there is a lack of theoretical understanding of how such variables contribute to women's ability to adapt to the experience of repeated conception failures.

Research aim:

The aim of the study was to provide a theoretical model of resilience among women undergoing fertility treatments, who experience repeated unsuccessful conception attempts.

Method:

Eleven women, aged between 24 and 41 years took part in this research. Two of the eleven participants had a medically unexplained infertility. Between the participants, the time trying to conceive ranged from 2 to 6 years.

Participants took part in a semi-structured interview around their experiences of living through unsuccessful conception attempts. The interviews lasted between 55 and 95 minutes, and were audio recorded and subsequently transcribed. The data was analysed using Grounded Theory (Corbin & Strauss, 2008; Charmaz, 2006).

Results:

Three core categories were identified: 'Appraisal', 'Stepping away from treatment' and 'Building self up for next attempt'.

Resilience was characterised by women's ability to appraise their capacity to carry on with conceptions attempts. This involved an evaluation of whether they had sufficient emotional strength as well as practical resources (e.g. money to invest into treatment). Women who identified themselves as having "enough" resources proceeded towards attempting pregnancy again. During this stage the women "built themselves up" for the next treatment attempts through a variety of actions such as taking control of their fertility experience, finding ways to nurture their strength, and finding ways of working towards their goal. Women also demonstrated their resilience by their ability to withdraw from the cycle of conception attempts when their resources have depleted in order to reconnect with wider aspects of their lives and restore their resources.

Clinical and research implications:

This theoretical model demonstrates the various ways in which women appraise, build or restore their emotional strength and practical resources which may have been depleted through the course of unsuccessful treatment attempts. As such clinicians may use this model to assess what stage their clients might be at and facilitate the process (i.e. help to appraise own resources, take control of treatment or step away from the infertility cycle). Further research should build on the current model and include women from wider ethnic and socio-economic backgrounds.

References:

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Appendix R - Summary of Research for the Research Participants

Dear [participant name],

Re: Living through repeated unsuccessful conception attempts: A grounded theory of resilience among women undergoing assisted reproductive treatment

Thank you for your participation in the above research project. I am writing to inform you that this research has now been completed. Please see the attached document for a summary of the research findings.

We have been able develop a greater understanding of how women adapt to the difficulties of repeated conception failures, thanks to your participation in this project and your willingness to share your experiences. Therefore, please accept my thanks for dedicating your time to this research.

Please do not hesitate to contact me, if you would like more information about the research, the findings, or how this information will be used. I would be happy to provide you with more information in writing or in person.

Best wishes,

Anna Bailey
Trainee Clinical Psychologist

Research Summary- Participants

Background information

Infertility is a highly distressing experience for both men and women. However, women struggling to conceive often report greater anxiety and depression than men. Attempts have been made to identify what helps women adapt to the adversity of infertility. Women who were found to be resilient (i.e. had the ability to survive adversity) were found to have better positive mental health than those with lower resilience. However, there is still a lack of understanding of how women undergoing treatment for infertility demonstrate this "resilience" when they face repeated unsuccessful conception attempts.

What we aimed to do

The aim of this study was to find out how women live through repeated unsuccessful conception attempts and demonstrate their resilience during this stage in their lives.

What we did

Eleven women took part in this research. They were aged between 24 and 41 years and had been trying to conceive between 2 to 6 years.

All participants took part in an interview around their experiences of living through unsuccessful conception attempts. The interviews lasted between 55 and 95 minutes, and were audio recorded and subsequently transcribed. The data was analysed using a Grounded Theory methodology, which aims to generate a theory in an unknown area of research.

What we found

We found that participants demonstrated their resilience by their ability to appraise their capacity to carry on with conceptions attempts. This involved an evaluation of whether they had sufficient emotional strength as well as practical resources (e.g. money to invest into treatment). Women who identified themselves as having "enough" resources proceeded towards attempting pregnancy again. During this stage the women "built themselves up" for the next attempts through a variety of actions such as by taking control of their fertility experience, finding ways to nurture their strength, and finding ways of working towards their goal. Women also demonstrated their resilience by their ability to withdraw from the cycle of treatment attempts when their resources have depleted, in order to reconnect with wider aspects of their lives and restore their resources.

What this lets us know

We now have a greater understanding of the process women go through when facing repeated conception failures, and how they adapt to this challenging stage in their lives. As such we know of the many ways in which women assess their ability to continue to pursue their goals of pregnancy and how they build on their strength to do so. We are hoping this will help clinicians know how to support women undergoing assisted reproductive therapies and assist them in building up their strength to pursue their fertility goals.

Once again, please accept my thanks for your participation in this research.

Best wishes,

Anna Bailey
Trainee Clinical Psychologist

Appendix S - List and definitions of fertility treatment options[5]

In vitro fertilisation (IVF)
Eggs are removed from the woman's ovaries and fertilised with sperm in a laboratory dish. Fertilised eggs (embryos) are then placed into the woman's womb. UK clinics can transfer only one to three embryos per IVF cycle, in order to minimise the risk of multiple pregnancies.

Intra-cytoplasmic sperm injection (ICSI)
ICSI differs from IVF in that it involves the injection of a single sperm directly into an egg. This fertilises the egg which is then transferred into the woman's womb as an embryo.

Intrauterine insemination (IUI)
Sperm is retrieved prior to the procedure and tested for quality. The best quality sperm is then inserted into the woman's womb during the most fertile time (during ovulation). Fertilisation occurs inside the woman's body.

Donor insemination (DI)
Involved IUI with a donated sperm which has been screened for genetic disorders and sexually transmitted diseases.

Gamete intra-fallopian transfer (GIFT)
Fertilisation takes place in the woman's body, by placing preselected (the healthiest) eggs and sperm into the woman's fallopian tubes.

In vitro maturation (IVM)
Women undergoing IVM do not need to take as many drugs before egg collection as they would under IVF, which involves collection of mature eggs. During IVM the eggs are surgically removed from the ovaries and collected when they are not fully matured. The maturation process then takes place in the laboratory before they are fertilised.

Fertility drugs
Medication given to women who are not ovulating properly (releasing an egg each month). Fertility drugs mimic the function of hormones which are responsible for egg production and release during ovulation.

Surgery
Procedure which can reverse sterilisation. In women this involves unblocking the fallopian tubes using keyhole surgery. For men, sperm is retrieved surgically prior to fertility treatment.

[5] Information taken from:
Human Fertilisation & Embryology Authority (2014). Your fertility treatment options. Retrieved from http://www.hfea.gov.uk/fertility-treatment-options.html

Appendix T - Journal's Notes for Contributors

BJOG: An International Journal of Obstetrics and Gynaecology

Published on behalf of the Royal College of Obstetricians and Gynaecologists

Edited by: Khalid Khan
ISI Journal Citation Reports © Ranking:
2014: 9/79 (Obstetrics & Gynecology)
Impact Factor: 3.728

Instructions for Authors

1. Is your paper suitable for BJOG?
2. How to submit your paper to BJOG
3. How to layout your paper
4. How to improve your paper
5. What happens after your paper is accepted?

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BJOG welcomes submissions of papers on all subjects relating to women's health. We give priority to papers containing original data, systematic reviews and commentaries suggesting innovative approaches to women's health problems. We have a global remit and publish papers from all around the world, including from both developed and developing countries.

Our readership is predominantly clinical but we welcome basic science submissions that have clinical implications. We are happy to consider qualitative studies provided they are written with the clinician in mind. The best way of appreciating the sort of papers we publish is to read some of our recent issues. We particularly appreciate a clear writing style with a minimum of jargon.

Initial assessment of submissions is done by our three Deputy Editors-in-Chief, who reject about 20% of papers at that time if they consider them not appropriate for our readership. This means you will get a quick assessment of your paper's suitability for the journal, giving you the opportunity to submit elsewhere with a minimum of delay if it is not suitable. Papers judged to be on a suitable topic will then be allocated to an editor for more detailed assessment.

A further 10% will be rejected at this point if the presentation, the methodology etc are judged to be inadequate. The remaining 70% will then be sent to referees, and following receipt of their reports, if one or more of the referees recommend publication, the paper will then be discussed between editors, with the final decision being based on at least a majority of five opinions. We currently accept about 15% of submitted papers.

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- Women' is generally preferred to 'patients' when reporting on obstetrics.
- 'Termination of pregnancy' is preferred to 'therapeutic abortion' and 'miscarriage' is preferred to 'spontaneous abortion'.

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Please refer to this paper for terminology of lower urinary tract function and this paper for early pregnancy events.

The following paper may also be useful: Use of Race and Ethnicity in Biomedical Publication (J. Kaplan, T Bennett, JAMA. 2003:289(20): 2709-2716.)

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The design of investigations, methods of analysis and the source of data should be described in sufficient detail to permit the study to be repeated by others, and must include specification of all statistical methods. Measurements should be expressed in SI units with the exception of haemoglobin (g/dL) and blood pressure (mmHg).

If human participants were involved, manuscripts must be accompanied by a statement that the experiments were undertaken with the understanding and appropriate informed consent of each. If experimental animals were used, the materials and methods (experimental procedures) section must clearly indicate that appropriate measures were taken to minimize pain or discomfort, and details of animal care should be provided.

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Milo A. Puhana, Gerben ter Rieta, Klaus Eichlera, Johann Steurera, Lucas M. Bachmann 'More medical journals should inform their contributors about three key principles of graph construction', Journal of Clinical Epidemiology 59 (2006), 1017-1022.

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