Review Article **IJPRR (2019) 2:22**

International Journal of Psychological Research and Reviews
(ISSN:2639-6041)

The mediating role of optimism and resilience on emotional distress in infertility: an integrative literature review

Diana Santa-Cruz[1], Soledad Chamorro[2], Juan A. Garcia-Velasco[1]

[1]IVI-RMA Madrid and Universidad Rey Juan Carlos, Madrid, Spain
[2]IVI RMA MADRID.

ABSTRACT

Objective: To find any role of optimism and/or resilience mediating emotional distress in infertility. **Method:** We performed a literature search for 2000–2017 in PubMed, PsycINFO and Elsevier, for original articles and reviews, using keywords “resilience,” “infertility,” “optimism,” “LOT-R,” “in vitro fertilization,” and “assisted reproductive technology.” Additional references were collected from articles located thereby. **Results:** The evidence reveals a growing trend of promoting people´s positive health assets and indicates significant negative associations of optimism and resilience with anxiety and depression and positive associations with self-esteem and perception of control. It seems optimism and resilience heavily influence physical and mental health and diminishes emotional distress due to infertility. Discussion: This review highlights the importance of the development of therapeutic and preventive interventions increasing optimism and resilience against affective dysregulation and emotional distress caused by infertility.

Keywords: Assisted reproductive technology (ART); Infertility; optimism; Resilience, Emotional distress

***Correspondence to Author:**
Diana Santa-Cruz
IVI-RMA Madrid and Universidad Rey Juan Carlos, Madrid, Spain.

How to cite this article: Diana Santa-Cruz, Soledad Chamorro, Juan A. Garcia-Velasco. The mediating role of optimism and resilience on emotional distress in infertility: an integrative literature review. International Journal of Psychological Research and Reviews, 2019, 2:22

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Website: http://escipub.com/

Introduction

The inability to conceive children leads individuals and couples to have very high levels of multifaceted stress [1–3] and depression [4–5]. This topic has been reviewed by various authors [3,6–10]. A systematic review [7] including 23 studies concluded that protective psychosocial factors for emotional adjustment during in vitro treatments included trait optimism, problem-focused coping, positive family/marital function, social support, situation appraisal involving acceptance of the situation, and secure attachment style. Originally proposed by Carver and Scheier, dispositional optimism can be defined as global expectations that things will turn out well in the future and bad things will be scarce [11–12]. This is particularly relevant to clinical psychology once it is associated with the risk of developing a psychopathology, not only at the individual but also at the social level [11–12]. Moreover, optimism is inversely related to hopelessness, a well-known risk factor for depressive disorders [13–17]. Similarly, it seems to confer resilience to stressful life events, and this resilience is associated with both onset and recurrence of various psychopathologies [18–19]. As an individual resource for coping, psychological resilience can help balance the negative effects of emotional distress, defined as negative emotional reaction to the output of resources (stressors) [77]. In short, there are enough reasons to believe that dispositional optimism and psychological resilience are positive predictors of subjective well-being and low emotional distress; most likely, those two dimensions are interrelated [20].

Despite diverse research publications on the benefits of optimism and resilience with respect to emotional distress levels, little is known about how these factors affect patients' experience and outcomes during assisted reproductive treatments. We aim to gather the most recent and best evidence regarding optimism and resilience as protective psychosocial factors and to identify variables that need further investigation, in order to build personalized psychotherapeutic strategies for infertile patients. This review responds to the need to identify new biopsychological markers of emotional resilience after studies have demonstrated the protective role of optimism and OFC volume against anxiety [45], highlighting the importance of developing therapeutic and preventive interventions to reduce susceptibility to/increase resilience against affective dysregulation and emotional distress in infertility.

Methods

A systematic literature search using PubMed, Science Direct, and Elsevier databases was performed using the limits "human" and the age range "adult" and "middle-aged." Original articles and literature reviews, published from 1 January 2000 to 31 December 2017, in English, were included using the following strategy: (optimism or optimistic), (resilience), (emotional distress), (infertility or infertile couple/s), (LOT-R), (in vitro fertilization), (assisted reproductive technology). The authors read the abstracts of the 120 articles found and excluded works dealing with systemic diseases. As the review was aimed at analyzing the relationship between infertility and stress mediators, we also did not take into account studies concerning exclusively cross-cultural aspects or ethical implications of involuntary childlessness. Of the initially located articles, 20 were analyzed in their full-length versions, and 4 additional relevant references were found in their reference lists; thus, the final number of articles taken into account was 24. Of these, 5 were reviews and 19 original articles. The relevant data gathered from the literature

review were categorized as either “Optimism as a buffer of emotional distress,” “Optimism and resilience,” or “Role of optimism and resilience in infertility.” The issues are discussed under each of the three aforementioned headings.

Results

Optimism as a buffer to emotional distress

Interest in the relationship between personality characteristics and physical health has increased hugely in the last decades. Dispositional optimism—an individual’s expectations of positive outcomes across situations and over time—is considered an individual difference or trait that is stable and applies more or less across a person’s lifespan [21].

The differences in how people face adversity have implications for success in completing goal-directed behavior, and also have implications for how they cope with emotional distress. A distress reaction is unique to each person based on individual characteristics and well as environmental factors that may impact the individual.

There are two ways to think about generalized expectations for the future and how to measure them. One is to do so directly, by asking people whether they expect outcomes in their lives to be good or bad, as reflected by the Life Orientation Test-Revised [22]. The other approach supports the idea that people’s expectations for the future arise from their interpretations of the past and how they give meaning to the things that happened to them [76]

Over the past 30 years, the body of research related to dispositional optimism has become increasingly rich, in particular that showing correlations between dispositional optimism and subjective well-being [19], for instance self-esteem, positive emotions, and life satisfaction [15,24–25]. On the other hand, negative correlations have been found between dispositional optimism and negative emotions, anxiety, and depression [10,16,26–27]. Optimism is a very stable trait. It is thought that it is about 25% genetically heritable [28] and arises from childhood environment, particularly the presence of conditions such as parental warmth and financial security [29–30]. Nevertheless, there are also variations in optimism, both transient and over extended periods. There is some evidence that optimism is more inconstant during life transitions, when there is a break from prior experience and outcomes become more uncertain [13]. A forthright influence of this trait is on how people feel when they face problems. Optimists are people who generally have a positive outlook and expect things to go their way in the future; conversely, pessimists are individuals who generally have a more negative outlook on life and expect things to go badly [12]. This small difference—between anticipating good versus anticipating bad—seem to have important impact on people’s lives, perhaps leading to or influencing differences in how they perceive and confront problems, how well they approach and cope with adversity, and in their resources, both social and socioeconomic. The conclusion might be that optimism is not only a disposition but it is also affected by ongoing life conditions and events through the way we explain the events that happen to us [76].

Research has suggested that various facets of positive well-being are associated with better health outcomes. This trait has been linked to reduced risks of chronic health conditions, especially to vascular factors, and to cancer survival rate [24,27,31]. One meta-analysis [32] found that optimism predicts health outcomes even when hard disease endpoints and direct markers of underlying physiologic state are used. The review showed statistically significant effec-

ts on survival of all-cause mortality in general population, cardiovascular outcomes, immune function, and cancer and pregnancy outcomes. Optimism has also been associated with lower depression symptoms at initial assessment during pregnancy and postpartum, to which optimism therefore appears to yield resistance [16,33–34].

Short-term randomized trials have suggested that optimism can be modified using fairly accessible tools like cognitive-behavioral psychological interventions [35] which makes optimism a promising target for intervention strategies aimed to improve well-being. However, the mechanism of the potential protective effect of optimism on health remains unclear. Optimistic people tend to prefer more positive health practices, engaging in higher levels of physical activity and reduced levels of smoking and alcohol consumption, as well as healthier diet [17,27,33,36]. Moreover, they more proactively adopt an active coping style when dealing with adversity, and are less likely to use avoidant coping strategies related to poorer long-term health [13,25,37–39]. Optimism is also inversely correlated with personality characteristics such as neuroticism, anxiety, and depression; these in turn are associated with poorer mental and physical health [40]. Nevertheless, even when these factors are controlled optimism appears to have a significant positive effect on health, which makes us believe that there are other pathways involved. One of those pathways might be the immune system [25,41–42].

A new study [43] identified orbitofrontal cortex (OFC) grey-matter volume as a structural neural marker of trait optimism in healthy functioning. This suggests that this region might help maintain the positive self-evaluation when threatened and the flexibility in coping strategies observed in optimistic individuals when facing adversity. It also showed a negative association between trait optimism and anxiety symptoms in healthy young adults, confirming previous evidence that trait optimism is a resilience factor in both healthy and clinical adults.

Resilience and optimism

Resilience, conceptualized as the capacity and dynamic process of adaptively overcoming uncertainty, conflict, and adversity while maintaining normal psychological and physical functioning, is a necessary factor in patients' adaptation [31]. More precisely, it can be defined as the belief that one can control the way one copes with adversity; it is one of the strongest buffers against mental health problems [18,44–45]. Most existing studies explore how resilience can prevent mental health problems and psychopathology, foster capacity to learn and develop positive skills, and be nurtured in the face of hardships such as socioeconomic deprivation, family discord, and maternal depression [41,46–47]. It is believed nowadays that resilience is trainable and can be increased over time by promoting early insight and understanding of life's struggles, and by encouraging the externalization of problems rather than their internalization and self-blame. Psychological traits common among resilient individuals include optimism, hopefulness, curiosity, and adaptability [21] (and therefore should adjust well to the uncertain outcome of infertility treatments).

Resilience may be critical in determining how individuals cope with and adapt to stress [48]. In one study [50] resilience was a possible protective factor for the couple's quality of life and against infertility-specific distress experienced by women. One situation causing distress is unsuccessful IVF attempts: the ensuing sense of loss, failure, and shame can progress into

enduring infertility-related depression, the alleviation of which might be facilitated by cognitive reappraisal as a coping strategy [45]. According to self-regulation theory [52], within a supportive environment, mild depression may itself be adaptive and could facilitate growth and recovery; indeed, individuals who strive to contemplate their problems experience a transient increase in negative emotions, followed by a great improvement in their psychological state [31].

In sum, considerable evidence indicates that pessimism can lead to self-defeating patterns: less persistence, more avoidance coping (defined as a maladaptive coping mechanism, characterized by avoiding to deal with a stressor, for instance, avoiding social activities), health-damaging behavior and potentially, given lack of hope for and confidence in the future [11, 12], even having the impulse to evade life, withdrawing from social relationships. Optimists, on the other hand, appear to take an active role minimizing health risks and reducing threats to well-being. It seems that people who expect a good thing to happen take active steps to ensure good things do happen, and experience teaches such people that their own efforts play an important part in life success, reinforcing their proactive attitude [12].

Optimism and resilience in infertility

Once an individual or couple is diagnosed with infertility, they have likely been through months or years of trying unsuccessfully to conceive. The journey of infertility can be likened to a rollercoaster ride. Each new cycle is met with excitement and anticipation, hopefulness and optimism; then, ovulation is followed by a two-week wait with anxiety and trepidation. With the Internet and social media, one can seek information immediately, but this information is not always accurate or helpful. Patients are bombarded with information from many sources, many of which try to convince them not to give up hope. A negative result can elicit a grief cycle, including sexual dysfunction, depression, anxiety, and relationship problems; without sufficient psychological intervention, stress levels can increase and affect coping skills and quality of life [53–57].

According to some recent results [55,58] and consistent with past research, over an 18-month period, a majority of women experience clinically significant levels of depression and anxiety: for depression, 56.5% of women and 32.1% of men, of whom 16.5% of women and 5.8% of men reported prolonged depressive symptoms, and for anxiety, 75.9% of women and 60.6% of men, of whom 40.1% and 28.1% reported prolonged symptoms.

A recent meta-analysis [6] of 14 studies indicated that although distress appears not to compromise the possibility of becoming pregnant in women undergoing fertility treatment, contrary to what many couples believe, definitive research is lacking and the relation is complex. The study showed several methodological limitations of the reviewed research: use of convenience (non-consecutive or selected) samples, failure to fully demonstrate equivalence of pregnant and non-pregnant groups on prognostic indicators before treatment, use of a “state” anxiety scale utilized weeks or even months prior to cycle start, and assessment of outcome after only a single cycle of ART treatment. Indeed, contrary to that study’s conclusion that stress does not impact ART outcome, the majority of research indicates the opposite: the largest meta-analysis on the topic [59] connected interventions with a cognitive-behavioral and/or mind/body approach to increased pregnancy rates and lower levels of psychological distress [3,4,5,

[54,60,61].

An early study on optimism and in vitro fertilization (IVF) failure [62] assessed coping and cognitive factors: demographic and reproductive history, general appraisal (dispositional optimism), situational appraisal (chances for success), and coping skills, using questionnaires. Eight weeks beforehand, participants reported their optimism, distress, expectancy of fertilization success, and the impact of infertility on their lives; two weeks after notification of negative pregnancy test, distress was measured again. Only optimism was found to predict follow-up distress: the most optimistic participants were the least distressed after a disappointing event, further contradicting the idea that optimists are more vulnerable to disappointment than pessimists. Feelings of loss of control, perceived self-contribution to IVF failure and use of avoidance as coping strategy were related to increased post-distress.

In this study, optimism protected women from infertility's treatments distress, consistent with evidence that optimism buffers against emotional distress [11] and does not put one at risk when optimistic expectations are challenged by failure. Of two hypotheses as to why—first, as optimists view their goals as attainable, they better withstand obstacles to their goals; second, optimists employ more instrumental coping, which helps them attain their goals—this study supported the second. Why optimism enhances adaptation has not been fully assessed. Dispositional optimism may be a function of ability to cognitively reframe more positively or to see the "silver lining." For instance, optimists may be more able to find or create benefits from their childless state. Although dispositional optimism appears quite protective, situational optimism (as perceived by estimated chances of success) seems not predictive of adjustment.

One study [63] used regression and structural equation modelling (SEM) analyses to check whether optimism effects on reproductive health were due to unique aspects of optimism, aspects related to coping strategies, or shared variance with another underlying personality dimension, like neuroticism. The last was shown to be the case; they hypothesized that personality variables impacted reproductive health through lifestyle (e.g., smoking), reproductive behavior (e.g., intercourse frequency), or activation of the hypothalamic-pituitary-adrenal (HPA) axis, which regulates stress response.

Two alternative routes may mediate stress effects on reproduction. First, a highly estrogenic environment like that of IVF may cause HPA activation and premature release of luteinizing hormone (LH) [64]. Second, release of corticotrophin-releasing hormone would increase cortisol and inhibit estradiol production [65–67].

A longitudinal study [9] on emotional adjustment vis-à-vis fertility treatment cycles had women and their spouses complete pre-, post-, and delayed post-questionnaires to assess state anxiety, depression, neuroticism, optimism, infertility-related cognitions of helplessness and acceptance, coping, and self-evaluated social support. Results showed lack of emotional recovery 6 months after treatment, which might be explained by continued uncertainty about the character of infertility and the possibility of different treatments. Personality characteristics, the idiosyncratic meaning of infertility, cognitive factors, and social support were important for emotional adjustment. In particular, neuroticism (especially) and optimism were interrelated with anxiety and depression.

A recent investigation [68] analyzed the prospective relation between bipolar dispositional traits

of optimism/pessimism and the outcome of a woman's first IVF treatment cycle; they also analyzed trait neuroticism to evaluate if the relations between optimism/pessimism and IVF failure were independent of effects of neuroticism. More pessimistic women at baseline were more likely to experience treatment failure in the following 18-month period, regardless of risk factors for poor treatment response. The authors' hypotheses were that pessimism may buffer psychological stress, enhance neuroendocrine dysregulation, and reduce immune function, as previous studies suggested.

Other survey research [69] examined individual recollections of emotional experiences trying to conceive and coping strategies, as well as personal and situational characteristics underlying variability from 429 American adults. The study revealed a smoother emotional road for people high in dispositional optimism, tolerant of uncertainty, who place relatively little importance on parenthood, are at low risk of infertility, and who have relatively high social, emotional, and cognitive resources, but a more difficult road for those low in dispositional optimism, intolerant of uncertainty, searching for meaning in their lives, who place greater importance on parenthood, or who have few coping resources.

One study [70] assessed the efficacy of brief couples' support-group sessions concurrent with IVF treatment. Results showed that women who attended sessions were significantly less anxious after IVF treatment than before the cycle, while men who attended were more optimistic than nongroup men and women but endorsed a great number of irrational beliefs related with IVF, fertility and parenthood.

Thus, classically, the main variables studied were anxiety and depression, without conclusive results [8]. New approaches have investigated variables such as distress and emotional imbalance—not clinical measures but functional psychopathology risk indicators for people undergoing stressful processes.

Discussion

Optimists cope, that is, attempt to manage stressful situations, in more adaptive ways than pessimists, prominently through problem-solving, positive interpretation, acceptance, and seeking social support, as distinct from disengagement, avoidance, denial, and distance that pessimists report. These differences are thought to reflect self-regulatory processes: optimists see positive outcomes as attainable and thus persist in efforts to realize their goals; pessimists disengage because their outcome expectancies are unfavorable [11,13,71]. Emotional distress may lower optimism, although there is some evidence that optimism is robust even in the face of stressful experiences [25,41,42]. Other studies [15,32] outline the importance for quality of life of one's capacity to modify his or her objectives situationally, allowing one to avoid or reduce negative psychological and physical consequences of non-achievement of a goal (e.g., failing to get pregnant after ART) and adaptively self-regulate to concentrate efforts on more attainable targets. This protects patients from repeated failures, while re-directing objectives gives back meaning and purpose to life. Managing difficulties itself also makes patients more optimistic towards their future as they are flexible towards their goals [11, 12]. This psychological flexibility protects them from the emotional consequences of failure. In short, the more optimistic patients are, the more easily they adjust to IVF failure and to their new reality [39].

The evidence reviewed in the preceding sections suggest that optimists have somehow found the keys to a rich and fulfilling life. Com-

pared to people who are more pessimistic, they experience less distress when they encounter adversity. They cope with stressful situations by remaining engaged in the goals and activities that the stressor is threatening. They engage in problem-focused coping when there is something to be done, and they display accommodative coping when adversity simply has to be endured. Maybe as a result of these differences in terms of coping strategies, they also have better health-related outcomes and better social connections, both broadly and in intimate relationships. In terms of disengagement and goal reengagement. When goals are perceived to be attainable optimists do not find it easier to disengage from those goals than pessimists. They do report, nevertheless, that it is easier for them to find new goals to value and pursue [32,71,72].

Evidence shows a growing trend to focus on the positive health assets and significant associations of increasing levels of optimism with lower levels of anxiety, depression and greater self-esteem and perception of control. It seems apparent that optimism is a mental attitude that heavily influences physical and mental health, as well as coping with everyday social and working life. Through an adaptive management of personal objectives and individual resources and by using active coping tactics, optimists are significantly more successful than pessimists in aversive events and when important life-goals are impaired. Dispositional optimism may be a function of the ability to reframe cognitively in a positive way or to see the silver lining in bad events. This review shows the up to date a short number of research dedicated to finding correlations between optimism and resilience and correlate it to the infertility experience during IVF treatments. The findings of the research done so far show stronger correlations between pessimism as a separate unipolar dimension and lower positive reproductive outcomes, presumably due to higher psychological stress, changed immune function, negative behavioral factors and neuroendocrine dysregulation. The good news is that empiric evidence also shows that personality traits are amenable to change and that pessimism is malleable [35]. Additional longitudinal and experimental research is required to determine whether optimism and resilience causally contribute to healthy behaviors and whether optimism and resilience could be an effective target for reducing emotional distress and maladaptive dysfunction. Most individuals and couples show resilience throughout their infertility experience and treatment pathway; nonetheless, around one-fifth of individuals are at risk of clinically significant emotional problems. Risk factors for emotional distress include previous psychological vulnerability, lack of social support, communication problems, and cognitions of parenthood as central to one's life [34,73] Only quite distressed patients will need specialized psychosocial support, but all patients will benefit from general psychosocial support integrated into routine fertility care. Such care should not only try to adapt the patient to the treatment process, but also the treatment and clinical processes to the patient's needs and preferences, before, during, and after treatment, to ensure long-term adjustment in case of unsuccessful treatment [74].

Although some projects have aimed specifically at increasing optimism, through the frame of positive psychology, other interventions may also have a beneficial effect on optimism. When people change negative schemas about themselves and the world or learn to deal more effectively with stress, they may gravitate to a more optimistic view of life in general. Encouraging

patients to be more proactive and less avoidant, and screening and treating them for depression, could contribute to long-term optimism and resilience and yield their benefits.

Psychological interventions in infertility must grapple with patients' sadness, guilt, anxiety, self-esteem and body-image, coping mechanisms, and their social implications. Couples counselling helps to explore gender differences and couple dynamics when faced with infertility, how couples learn to support and understand each other, how to enhance communication between them. Group work brings patients the opportunity to share with others in the same circumstances and normalize their reactions, deal with specific feelings and concerns, and manage relationships with family and friends [75]. Psychological interventions may also promote pregnancy [4], perhaps by reducing anxiety and depression and/or promoting compliance.

Only when we understand which individual psychological traits foster positive infertility experience can we develop patient-centered interventions and treat mood disorders (like anxiety or depression) early and efficiently, to improve patient care and reduce dropout due to emotional burden by equipping patients with resources to cope with treatment difficulties, loss of control, and uncertainty, and to encourage a healthy lifestyle. The aim of psychological intervention in infertility must be to help patients "accept the outcome as acceptable," giving a personal meaning and purpose to the journey, within patients' own beliefs, and seeing the situation as an opportunity to understand their own resources, resilience, and limits—as individuals and couples. Moreover, reducing pessimism may help achieve better treatment outcomes in less time. Indeed, simply knowing they are at risk for distress during ART may motivate vulnerable individuals to muster and extend their social and emotional resources before beginning their efforts. What is learned and discovered from the infertility experience will probably be more important than the results of such interventions for reproductive success rates, if it can foster the understanding of parenthood as only one facet of the human experience.

Acknowledgments

None

Disclosure of Interest

None

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