

Infertility-Related Stress and Coping Strategies among the Patients Undergoing in Vitro Fertilization

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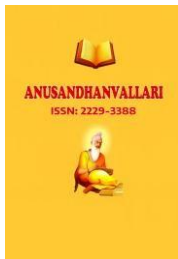
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Abstract: Infertility is a complex medical condition that carries serious psychological repercussions, often imposing psychosocial stress on affected couples, particularly women. Female infertility is stigmatised in many societies, challenging a woman's self-identity, social status and exacerbating emotional distress. This review looks at the psychological burden experienced by infertile women undergoing IVF and the effectiveness of different coping mechanisms employed to reduce stress, anxiety, and depression. The IVF process necessitates substantial emotional resilience and adaptive coping strategies to navigate treatment uncertainties, societal expectations, and self-perceived inadequacies. Findings from the reviewed literature indicate that infertile women employ a variety of coping mechanisms, such as problem-focused coping, meaning-based coping, activeconfronting coping, and emotion-focused coping. While adaptive coping mechanisms, such as problem-focused and meaning-based strategies, are associated with improved psychological adjustment, maladaptive approaches, such as avoidance and passive coping, have been linked to increased distress and depressive symptoms. The review also highlights the role of standardised psychometric tools, including the Perceived Stress Scale (PSS), Infertility-Related Stress Scale (IRSS), State-Trait Anxiety Inventory (STAI), and Hospital Anxiety and Depression Scale (HADS), in assessing psychological distress among IVF patients. The level of psychological stress experienced by infertile women is significantly high, which must be treated. Cognitive Behavioural Therapy (CBT) has been extensively studied, demonstrating significant reductions in anxiety, stress, and depressive symptoms by helping women restructure negative thought patterns. Mindfulness-Based Stress Reduction (MBSR) interventions have also promoted emotional resilience and reduced psychological distress. Additionally, women who adopt problemfocused coping strategies, such as seeking information, planning, and actively engaging in the treatment process, experience lower levels of distress compared to those who rely on avoidance-based coping. This review emphasises the critical need for integrated psychological support interventions for women undergoing IVF. Given the high prevalence of stress and distress, structured psychological therapies and support systems should be embedded into fertility treatment programs to enhance coping abilities and overall mental well-being.

Keywords: Infertility, IVF, psychological stress, coping strategies, psychological interventions, mindfulness, emotional well-being, anxiety, depression.

Introduction

Millions of people around the world are confronting multiple health issues at diverse ages and stages. One of them is Infertility, which is regarded as a complex biological condition in which one cannot reproduce, distressing couples and individuals, specifically women. It imparts considerable psychological effects that disrupt the social and emotional equilibrium of lifestyle. As defined by the World Health Organisation (WHO), it is the failure to conceive a clinical pregnancy after 12 months or more of regular unprotected intimate contact (WHO, 2020). To overcome the issue of infertility, Assisted Reproductive Technology (ART) is used, in which IVF (In-Vitro Fertilization) emerged with a high success rate. . IVF has revolutionised reproductive medicine, resulting in over 8 million births since 1978 (Eskew & Jungheim, 2017). Advances such as embryo freezing, ICSI, and genetic testing have improved success rates, although ethical concerns remain. With the increasing prevalence of



infertility, the demand for IVF is expected to grow globally. The technological gift for their quest for children gives a respite to the couple through IVF. However, there is always an uncertainty in the prediction of IVF outcomes till the birth of the child, which stresses the mother constantly throughout the treatment (Greil, SlausonBlevins, & McQuillan, 2010). The success of IVF is contingent upon many aspects, including proper treatment, a relaxed mindset, adequate rest and clinical care. IVF, along with giving hope to women, also necessitates the mental strength to combat the stress induced by the medication and emotional instability.

These emotions have a fluctuating nature during the IVF treatment, and patient's psychological condition should be addressed properly with major focus on the de-stressing her minds. Various stress coping strategies are employed by women to adequately handle the infertility related stress while undergoing IVF treatment. Some of these strategies provided favorable outcomes, whereas some did not. For the psychological care of IVF patients, strategic interventions are essential to enhance the treatment effectiveness, along with promoting a stress-free mindset.

A coping mechanism or strategy can be defined as the cognitive and behavioural practices by an individual to face their distressing conditions (Lazarus & Folkman, 1984). The broad category of coping strategies encompasses problem-focused and emotion-focused mechanisms. The problem-focused mechanism is identified as an approach that addresses both the problem and its underlying cause. The stress is coped with by targeting the stressor and identifying the solution to the problem or the stressor. This coping mechanism positively affects the mind and helps in processing the stressful circumstances with a solution. Another coping strategy is an emotion-focused strategy, in which the individual provides an emotional response to stress. In this mechanism, the social support, engagement in relaxing activities, therapy or avoiding the situation is included. Other coping mechanism includes meaningfocused mechanism, Active confronting coping, avoidance coping and social support utilisation mechanisms.

Research highlighted that the women patients should get social assistance, family and peer support groups, as they play a crucial role in relaxing the mind and coping with stress (Foti et al., 2023). The patient should focus on personal growth, which can be achieved through self-care, meditation, and exercise, and helps reduce stress. Patients should also be engage in such activities that maintain their psychological well-being and facilitate the effectiveness of therapy (Matthiesen et al., 2011). To alleviate the stress and implement effective coping strategies, some psychological interventions have been found helpful. Such as psychological counselling, CognitiveBehavioural therapy, and mindfulness-based interventions, are beneficial in diverting the mind from stress to positive thinking. These activities help reduce associated anxiety and depression, along with improving the coping strategies (Frederiksen et al., 2015).

Numerous Global studies have been conducted and continue to analyse the infertility across various regions and its psychological impact on women. However, research deficits persist about the coping strategies of individuals and couples. Research is being conducted on the impact of stress, prevalence of infertility due to multiple factors, coping strategies, influence of coping strategies in the IVF treatment, etc.

This review aims to analyse the stress and its impact on the psychological well-being of infertile women. Due to the incompetence of childbearing, women may direct self-criticism on themselves, resulting in self-doubt and subsequent suffering. The review examines coping strategies to mitigate the stress during the IVF treatment. The existing research literature has findings on the stress and the effect of coping strategies on stress due to infertility and IVF treatment. This review will provide an extensive analysis of such research findings and will contribute to a good understanding of areas such as infertility, application of IVF treatment, psychological stress and its effect and coping strategies and propose potential direction for future research and interventions.

Methodology

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines (Page et al., 2021). A comprehensive search was performed across PubMed, ScienceDirect, PsycInfo, APA PsycNet, BioMed Central, and Google Scholar using keywords such as coping strategy, psychological interventions, stress, IVF, infertility, and women's psychological well-being.

The initial search yielded 1,958 records. After removing duplicates ($n = 1,046$) and excluding 27 for other reasons, 885 titles were screened. Of these, 345 were excluded as irrelevant. Abstracts of 540 papers were reviewed, with 256 excluded for not meeting topic requirements. Full text assessment was conducted for 284 articles, resulting in 231 exclusions. Ultimately, 71 studies met the inclusion criteria and were analyzed in this review.

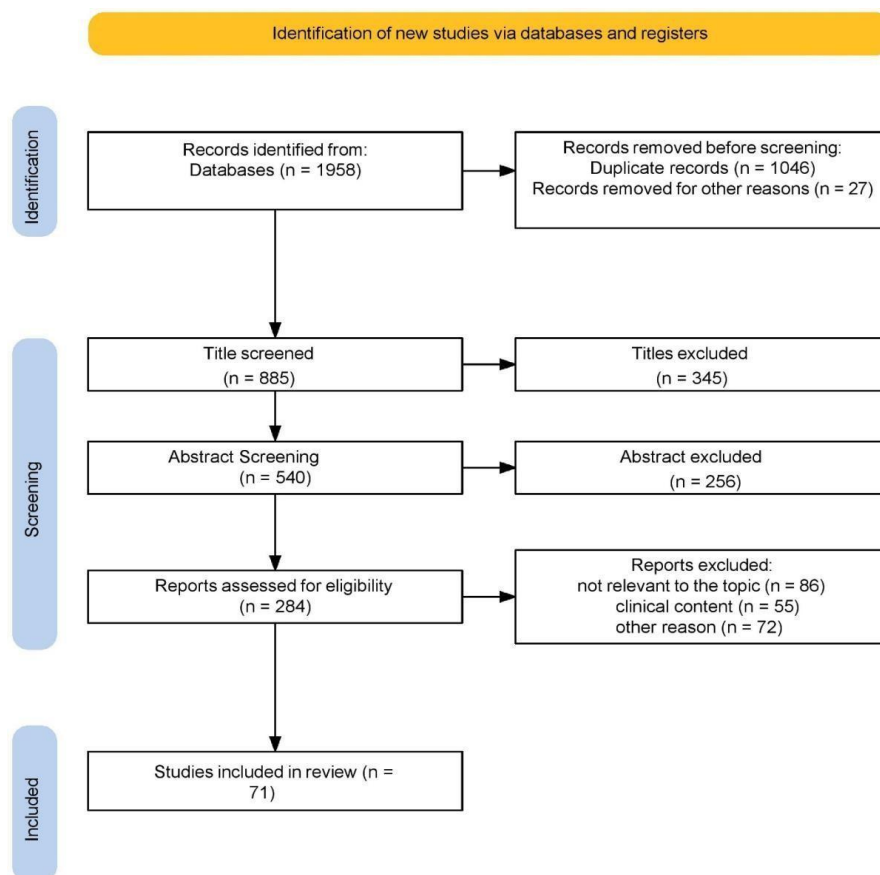


Figure 1. PRISMA 2020 Flow Diagram of Study Selection

Stress and Challenges of Women Undergoing IVF

Women undergoing IVF face significant psychological challenges, with studies reporting that up to 40% experience anxiety and depression during treatment (Pasch et al., 2012). Stress arises from unpredictable outcomes, hormonal fluctuations, social expectations, and fear of failure. Research using standardized tools such as the State Trait Anxiety Inventory (STAI) and Perceived Stress Scale (PSS) has shown that higher stress and anxiety scores are linked to lower IVF success rates (Turner et al., 2013). Conversely, some studies found no direct association between psychological distress and clinical pregnancy outcomes (Peng et al., 2021), highlighting the complexity of this relationship. Nonetheless, evidence consistently suggests that psychological interventions,

including counseling, group discussions, and mindfulness based approaches, can reduce distress and improve resilience. Stress levels are often highest during the waiting period for treatment outcomes, underscoring the need for targeted support throughout the IVF process.

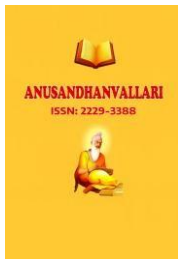
Beyond treatment related stress, infertility itself imposes a heavy emotional burden, particularly on women due to societal stigma and expectations. Infertile women report higher rates of anxiety, depression, grief, and low self esteem compared to fertile counterparts (Purewal et al., 2018). Meta analyses confirm that anxiety prevalence among infertile women ranges from 15% to 58%, exceeding general population levels (Kiani et al., 2020). Factors such as poor education, unemployment, joint family structures, and prolonged infertility further exacerbate distress, while regular exercise and supportive family environments are protective. Social stigma has been strongly correlated with severe depression and reduced quality of life. Collectively, these findings emphasize that infertility related stress is comparable to the psychological impact of chronic illness, and integrated psychological care is essential to safeguard women's mental health during IVF.

Coping Mechanism of Patients Undergoing IVF Treatment

Problem-focused coping strategies: Multiple studies suggested that the coping strategies influence the IVF treatment outcome. A positive effect on lowering the stress can be achieved by problem-focused, active coping and seeking social support strategy, whereas a negative effect on stress can be due to passive strategies such as denial, avoidance, social escape and ignorance. Jing et al. (2021) compared the active-confronting strategy, which indicated the problem-focused approach that has a significant negative relation with stigma and quality of life scale of the study. In the depth study done by Gourounti et al. (2012), it was observed that the problem appraisal coping strategy was negatively significant in associated with fertility stress and symptomatology scores, indicating depression. The relation was compared to other coping styles among 137 infertile women under IVF treatment and found that the perception of treatment controllability was high with a problem-focused coping mechanism. The perception of infertility controllability and the adopted stress coping styles were significantly related to the infertility stress, and interventions were suggested to address the stressor and ease the risk of stress-related consequences. Many previous studies have concluded about the interrelation of infertility stress and coping mechanisms. Cina (2007) in a study suggested the women under IVF treatment had variable perceived control during the different phases of IVF treatment. The problem-focused coping was adopted by the patient in the initial or stimulation phase of treatment, whereas emotion-focused coping was more prevalent during the anticipation phase. The problem-focused coping was adopted during the high control stage of treatment. Mirzaasgari et al. (2022) in their study showed that the active confronting and other coping strategies in which the problem was focused and the women sought solutions were associated with a lower level of stress and anxiety, whereas coping mechanisms had no effects on the outcome of IVF treatment. The problem-focused coping strategy is based on actionoriented thinking, in which one seeks the solution to the problem or validates the stress and tries to overcome. Particularly in infertile women, the prevalence of stress is very common, and it leads to anxiety and depression, which need to be addressed. Women, on their part, face these stresses and try to adapt or overcome the longitudinal situation. The Problem-Focused Coping strategy is a meaningful coping mechanism as it involves the identification of a critical goal and encourages the individual's focused attention to it. Practising this helps the individual to feel effective and master the situational control (Folkman & Moskowitz, 2000). The study finds that coping based on problem targets was critical for the well-being of patients (Klinger, 1998).

Avoidance-Based Coping Strategies:

Avoidance-focused coping involves temporarily reducing stress by avoiding certain situations, thoughts, or emotions. Cognitive avoidance strategies are used for distraction, ignoring problems, or avoiding dealing with stress (Rodino et al., 2018), whereas behavioural avoidance strategies include avoiding people, places, and situations that are causing stress or anxiety. Research conducted with 154 infertile women in which it was found that avoidance and other coping strategies have no significant relation with pregnancy outcome, but self-blame



and mental frustration were related to anxiety and depression. However, use of coping strategies was associated with low depression and stress levels (Mirzaasgari et al., 2022).

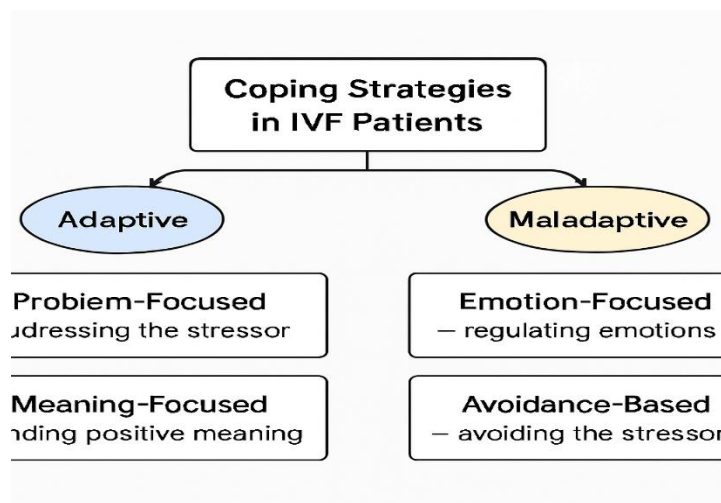
It is generally viewed as unhealthy and ineffective because being avoidant doesn't address the root causes of stress and tends to increase stress and anxiety when overused. In a research study, stigma and the FertiQoL scale were used to assess the avoidance-based coping strategy correlation among them. The stigma scale used in the study refers to perceived stigma and self-stigma, and the FertiQoL scale assesses the quality of life of the participants. The study was done with 768 infertile women, which suggests that the stigma scale was highly correlated with avoidance coping style and negatively impacted FertiQoL (Jing et al., 2021). In a multicentre cross-sectional study, 416 women were asked to fill out the questionnaire to find the correlation between perceived stress, avoidant coping style and eating pathology. These findings suggest that infertile women using avoidant coping strategies have a direct effect on maladaptive eating behaviours. Statistically significant indirect relation was found with CI 95% between perceived stress and eating disorders by using the avoidant coping strategy (Rodino et al., 2018). Avoidance strategies, such as avoiding conversations about infertility or engaging in activities to distract from the issue, can lead to increased stress and anxiety for individuals and couples undergoing IVF. In a study, 120 women participated, in the study and measures used were the Infertility Problem Stress Inventory and Coping Scale. Multiple regression scale showed a significant relation between active avoidance coping strategy and infertility stress, whereas meaning-based coping strategy was less significantly associated with infertility stress (Aflakseir & Zarei, 2013).

Coping strategies refer to the individual's cognitive ability to control and manage a stressful life event. Infertile women used passive avoidance coping more frequently than other coping types. Avoidance strategies can indicate a lack of confidence in the effectiveness of IVF treatment, which can lead to increased anxiety and stress. In a study conducted by Truong et al., 2024 to understand the association between coping strategies and perceived social support among 383 infertile women undergoing IVF treatment. The women who practised passive and active avoidance coping strategies were associated with decreased perceived social support, and those women who practised active-confronting coping strategies were predicted to have good social support. Women are more vulnerable to psychological distress, so the reaction to infertility in women differs from men. Infertile couples use the strategies for coping with the stress of infertility, and apply various coping strategies to manage their personal and family crisis. A study conducted with 186 Israeli women undergoing IVF, found in path analysis that who adopted religious coping strategy were with reduced mental distress but no effective enhanced psychological wellbeing whereas women who seek approval and recognition in the community was having low relation with increased psychological distress and effective enhanced psychological well-being (Nouman & Benyamini, 2019). For IVF patients, frequent use of avoidance coping strategies can undermine their mental health. In IVF patients, reliance on avoidance can lead to withdrawal from the treatment process, disrupt the emotional process, and reduce confidence in the effectiveness of the treatment, potentially affecting the success of the overall treatment.

Meaning-Based Coping Strategies:

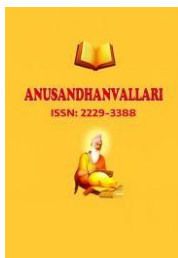
Meaning-based coping Strategies help in handling stress differently. the individual reinterprets the situation to change its sense, which can be bearable when one can't control the situation. This strategy is important in various chronic and uncontrolled challenges where outcomes are very uncertain. Several studies reveal that the impact of coping strategies on fertility-related quality of life (FertiQoL) is especially meaningful for coping strategies. Jing et al. (2021) found that stigma harms FertiQoL, with active-avoidance, active-confronting, and passive-avoidance coping strategies reducing this impact. While meaning-based coping had a positive mediating effect. Similarly, Ghazanfarpour et al. (2014) found that among women with infertility, participants reported using predominantly passive-avoidance coping strategies. Infertility stress was reported to be lower in those who used meaning-based coping, whereas active-avoidance strategies were associated with higher stress levels. Reisi et al. (2023) extended these findings by examining the role of spousal coping strategies. Women who engaged in goal replacement coping had significantly reduced levels of depression, anxiety, and stress. Self-blame and self-focused thinking

are associated with higher levels of psychological distress. Husbands who supported goal change made positive contributions to their wives' mental health, while spouses who engaged in self-blame increased distress. Several studies investigated the interrelations between male and female coping strategies. in. Volmer et al. (2017) demonstrated that active avoidance in women was positively associated with anxiety and depression, while Meaningbased coping in men is negatively associated with risk. Coping strategies of couples are interconnected and influence the emotional well-being of both partners. Peterson et al. (2011) showed that meaning-based matching led to long-term marital benefits. Their study found that couples who used meaning-based coping strategies observed increased relationship satisfaction over time. However, gender differences were identified, with women seeing an initial increase in the benefit of marriage and then a decline after five years, while men showed continuous growth. Yousefzadeh et al. (2017) examined predictive factors of fertility quality of life and found that meaning-based coping was positively associated with improved FertiQoL, while active avoidance coping was related to lower scores. Their findings indicate the need for psychological treatments that support flexible coping strategies. Schmidt et al. (2005) looked at whether poor communication with partners and the use of active avoidance coping were major factors in increased fertility-related stress levels. On the other hand, active coping strategies, such as seeking social support and expressing emotions, are associated with reduced stress levels in both men and women. The use of spirituality as a coping strategy has been studied recently. Nab et al. found that engaging in faith-based rituals, prayer, or belief in a higher purpose provides emotional stability and reduces distress and incorporating spiritual counselling into infertility treatment can increase emotional support for patients.



Social Support and Psychological Interventions:

Some women were reported to have suffered guilt, inadequacy, and loss of control, which exacerbates their psychological burden (Boivin & Schmidt, 2005). The woman patient's psychological needs should be addressed properly for the positive outcome of treatment through close social connections and family. For infertile women undergoing IVF, social support interventions are effective coping strategies. Various social support interventions have been explored as effective coping strategies to help women navigate this challenging experience. Yazdani et al. (2017) analysed that counselling-supportive interventions to reduce the perceived infertility stress of infertile women. Structured psychological support, such as cognitive-behavioural therapy (CBT), stress management, and mindfulness, effectively reduces anxiety and improves quality of life. Resilience and social support are positively correlated with posttraumatic growth (PTG). Li et al. (2014) found that women with high resilience and strong social supports experienced greater psychological growth. Positive coping partially mediated the impact of

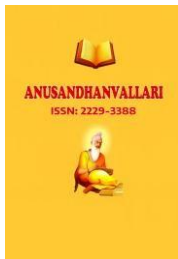


resilience on PTG, while it mediated the relationship between social support and PTG. Casale & Carlqvist (2021) showed that social support has a positive association with better mental health, and it also has a role in compliance with therapy and success rates. Social support treatments might improve emotional health and IVF results by being included in infertility treatment. Lima et al. (2018) find that the effect of MBP (mindfulness-based program) reduced stress and symptoms of depression in infertile women. While increasing the general well-being of infertile women. It improved their overall psychological well-being. Domar et al. (2011) investigated that mind/body intervention effectively reduced psychological distress of women and improved IVF outcomes. Martins et al. (2011) investigated the direct and indirect impacts of perceived social support on stress related to infertility in women getting fertility treatments. Health professionals should explore the social networks and encourage seeking positive support from family and partners. Adding coping skills training into counselling therapies could also help clients move from active-avoidant coping to meaning-based and active-confronting methods.

Healthcare providers to assess patients' psychological resilience and social support when developing mental health interventions to mitigate the risk of anxiety and depression and enhance reproductive outcomes. Yan et al. found that perceived social support was positively correlated with psychological resilience and both were negatively associated with anxiety and depression. IVF-ET patients receive more emotional or financial support from their families. Emotional support in the form of phone calls experienced lower stress levels in women undergoing IVF. Skiadas et al. (2011) found that emotional support effectively reduced psychological distress during the luteal phase in women undergoing IVF. While it did not directly impact the pregnancy rate. ART patients received either standard care or supportive phone calls from social workers between embryo transfer and pregnancy testing. For couples undergoing IVF, interventions that treat emotional anguish associated with pregnancy and enhance partner relationships will enhance psychological well-being and marital stability. Ying et al. (2015) find these things. Chinese couples undergoing IVF using a qualitative descriptive approach. Couples faced physical and emotional distress, struggles with the urgency of conceiving, and disruptions in daily life. Mutual emotional support strengthened their relationship. Salakos et al. (2004) found that Women who take part in IVF programmes do not receive any scientific information or psychosocial support. Women need the help of a doctor with extensive medical experience. Social networks significantly influence fertility decisions. Bernardi and Klärner (2014) found that Women are more affected by their social circles than men in fertility-related decisions. While a lack of helping connections may result in delayed or reduced childbirth, positive social networks could increase fertility rates. LoGiudice and Massaro (2018) find that complementary therapies such as Hatha yoga, cognitive-behavioural interventions, and mind-body therapies reduce anxiety, depression, distress, and stress while improving fertilityrelated quality of life. Women undergoing IVF may have better psychosocial health results if complementary therapies are included in the treatment plan. Including spiritual guidance in infertility treatment can improve mental health and general quality of life. Beygi et al. (2021) used General Health Questionnaire (GHQ-28) to measure mental health status, and the WHO Quality of Life-BREF (WHOQOL-BREF) to evaluate overall quality of life and found that spiritual well-being and quality of life has positive correlation and spiritual well-being, mental health issues are negative correlation also women with greater spiritual well-being experienced fewer mental health concerns.

Discussion

This review highlights the significant psychological burden experienced by women undergoing IVF and the diverse coping strategies employed to manage infertility-related stress. Evidence consistently shows that adaptive coping mechanisms, such as problem-focused and meaning-based strategies, are associated with reduced anxiety and improved psychological adjustment, while avoidance-based coping tends to exacerbate distress and undermine resilience. Psychological interventions, including cognitive-behavioural therapy (CBT), mindfulness-based programs, and structured social support, have demonstrated efficacy in alleviating stress and enhancing quality of life (Domar et al., 2011). These findings underscore the importance of integrating psychosocial care into fertility treatment programs to improve both emotional well-being and treatment engagement.



Limitations and Research Gaps

Despite the growing body of evidence, several limitations remain. First, many studies rely on cross-sectional designs and self-reported measures, which may introduce bias and limit causal inference (Pasch et al., 2012; Peng et al., 2021). Second, heterogeneity in psychometric tools—such as the use of PSS, STAI, and FertiQoL—makes it difficult to compare outcomes across studies. Third, cultural differences in coping styles and social support are underexplored, with most research concentrated in Western or urban populations, leaving gaps in understanding among diverse cultural contexts (Purewal et al., 2018). Additionally, while interventions like CBT and mindfulness show promise, few randomized controlled trials have examined their long-term impact on IVF success rates or sustained psychological resilience (Frederiksen et al., 2015).

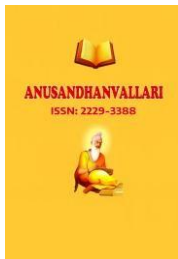
Future research should prioritize longitudinal and multicenter studies to evaluate coping strategies across different phases of IVF treatment, incorporate standardized psychometric assessments, and explore culturally sensitive interventions. Greater emphasis on partner and family dynamics, as well as the role of digital and community-based support systems, may also provide new avenues for enhancing psychological care in infertility treatment.

Future Prospective

The prevalence of infertility is directly associated with the prevalence of distress, which can be an indication of the need for specific interventions which can help relieve minds from distress. The observation of the oftenoccurring longitudinal stress done by various researchers also recommended multiple interventions and the adoption of coping strategies to reduce depression and anxiety. Research done with Indian women reported to have 58% of them were having depression and 24% were experiencing anxiety (Dadhwal et al., 2022). This high prevalence requires more study to solve the issue with success in physical and mental wellbeing. Along with the Technological advancement for the hope of clinical pregnancy, mental stability should also equally be given focus. Further researches are needed to evaluate and justify the effect of different coping strategies for the long term or duration. As IVF is a long process and requires a constant, relaxed mind to have good effects on the well-being of the mother and the baby. Some societal awareness and interventions researches are needed to change the societal thinking about infertility and having babies produced with the help of technology. There is also scope for the mind-body interventions to combat the challenging situation with the help of and problem-solving mentality. Several studies were done in which the role of family and marital partners was observed, but still, more research and family intervention are needed to look at the infertility challenge from a different angle.

Conclusion

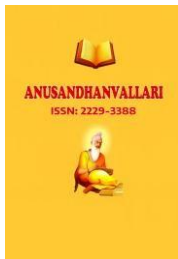
The study finds a high occurrence of stress and depression in millions of individuals who are dealing with infertility. The technological advancement is fulfilling the desire of parenthood, but still, many couples fail to get the positive results of their technological treatment. IVF is one of the commonly adopted Infertility treatments used for the conception of a child. The common and major issue the infertile women face is the stress of the question of their femininity and individuality. Such a stressful mindset leads to depression and anxiety, which affect the overall psychological well-being and quality of life. Each IVF patient undergoes multiple distressing conditions and copes with their stress using different mechanisms. Avoidance-based coping strategy adopted by the infertile women was found to be negatively affecting them, pushing them towards more emotional turmoil. In vice-versa to this, problem-focused coping mechanism seems to be more profound in reducing the stress on IVF patients. Another coping strategy, such as a meaning-based coping mechanism, also provides relaxation to the mindset of the patient. Adoption of a coping style or handling the stress should be supported by some psychological intervention, which will help in creating the full effect of this coping strategy. In many cases, patient undergoing IVF treatment suffers a lot due to stress, which can also lead to negative results of the treatment. Hence, social support, partner support, clinical counselling, peer group support and self-improvement (exercise, meditation, journaling, etc.) should be adopted to improve the psychological well-being of the patient to have positivity during the treatment.



Ethics Approval and Informed Consent Statement – Given that this study is a narrative review of published literature and does not include original data from human or animal participants, it was exempt from ethical review board approval or informed consent.

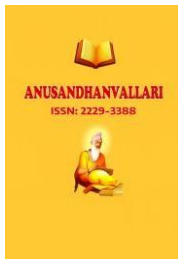
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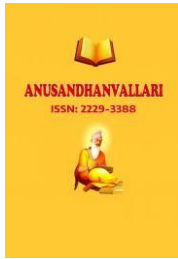
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