

Motives for parenthood, psychosocial factors and health in women undergoing IVF: A systematic review

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ABSTRACT

INTRODUCTION: Infertility affects 8-12% of reproductive-age couples globally, leading to significant psychosocial challenges (World Health Organization, 2020). This review explores the psychological aspects of in vitro fertilization (IVF) treatment and its impact on mental well-being.

METHODS: A systematic review of 13 studies was conducted using Google Scholar, Tandfonline, Medrxiv, and PubMed. Inclusion criteria included studies on women aged 18-50 undergoing IVF, focusing on psychosocial and health factors, published in English or Greek.

RESULTS: Women undergoing IVF reported increased anxiety during the second and third trimesters. Psychological interventions, such as hope-oriented group counseling, improved mental health and quality of life. Patient satisfaction with IVF was generally high, influenced by demographic variables and psychological factors. Higher stress levels were linked to lower IVF success rates. The COVID-19 pandemic exacerbated psychological distress and treatment delays.

CONCLUSION: Addressing psychological well-being in IVF is crucial. Integrating psychological support, counseling, and stress management interventions can enhance patient experience, improve treatment outcomes, and promote overall mental health. Further research is needed to develop tailored interventions that address the unique needs of individuals undergoing IVF.

INTRODUCTION

Quality of life, encompassing physical health, mental well-being, personal beliefs, independence, and the environment, is influenced by various factors according to the World Health Organization (World Health Organization, 2018). Infertility is a condition defined as the failure to conceive after a specific duration of unprotected sexual intercourse. It affects approximately 8-12% of reproductive-age couples worldwide (World Health Organization, 2020).

Both male and female factors contribute to infertility, with causes including inflammation, hormonal disorders, anatomical issues, and demographic and lifestyle factors. Infertility can have significant psychosocial and emotional effects, leading to stress, depression, anxiety, guilt, and tension (World Health Organization, 2018, Malina and Pooley, 2017). The emotional journey of infertility is characterized by hope and despair, influenced by ovulation and menstruation cycles. Infertility can impact various aspects of individuals' lives, including work, relationships, and financial stability. Social stigma and societal expectations further intensify the emotional impact (Wang et al., 2007, Miller et al., 2019).

In vitro fertilization (IVF) is a common method used to address infertility. While it offers benefits, it also presents psychological challenges, time-consuming procedures, invasiveness, medication use, anesthesia, and a possibility of unsuccessful outcomes (World Health Organization, 2018). These factors contribute to psychological burden, stress, and potential negative effects on the quality of life (QoL) for couples undergoing IVF (Wang et al., 2007, Peterson et al., 2006).

The present systematic review aims to explore the motives for parenthood and the psychosocial and health factors experienced by women undergoing IVF treatment. By conducting a comprehensive review of the available literature, this study aims to gain insights into the psychological and emotional aspects of IVF, as well as its impact on the overall well-being of individuals and couples. Understanding these factors can contribute to the development of appropriate support systems and interventions to improve the QoL of individuals navigating the challenges of IVF treatment.

Prosperity and happiness are important motivations for both men and women. For women, motherhood is often considered

essential for their female identity, influenced by social norms and family perceptions. However, social reasons may not be significant for all couples, and the desire for parenthood can evolve and change over time for infertile women (Lukse and Vacc, 1999, Lykeridou et al., 2011).

The birth of Louise Brown, the first baby conceived through in vitro fertilization (IVF), in 1978 marked a significant milestone in assisted reproduction. This breakthrough technique involved fertilizing the egg outside the body and transferring the resulting embryo to the uterus. Since then, IVF has become a widely used method in treating infertility (Lykeridou et al., 2011).

Assisted reproduction techniques, such as in vitro fertilization (IVF), provide solutions for couples facing fertility problems. IVF involves stimulating the ovaries, collecting eggs, fertilizing them in a laboratory, and transferring resulting embryos to the uterus. The success rate of IVF is around 10%, and multiple embryos may be transferred to increase the chances of success, potentially leading to multiple pregnancies. Preimplantation Genetic Diagnosis (PGD) is a technique used with IVF to screen embryos for genetic conditions (Malina and Pooley, 2017).

IVF has advantages in offering reproductive options to couples with infertility, but it also has drawbacks. Medications, the cost of treatment, and psychological distress are often cited as disadvantages. Women undergoing IVF may experience higher levels of anxiety and depression, and pre-existing personality traits can influence their vulnerability to emotional distress. Understanding the psychosocial factors and impact of IVF on women's health is crucial for providing appropriate support and interventions (American Psychological Association, 1991).

The psychosocial impact of IVF extends beyond emotional well-being (Lykeridou et al., 2011). The financial strain of treatment, time commitments, and the societal stigma surrounding infertility and assisted reproduction can also affect individuals and couples (Rahim et al., 2021, Lukse and Vacc, 1999). Supportive interventions that address the psychological and emotional needs of women undergoing IVF, as well as providing comprehensive support throughout the process, are crucial for improving outcomes and overall well-being (Malina and Pooley, 2017).

By recognizing the challenges, providing adequate support, and offering appropriate interventions, healthcare providers can enhance the experience and well-being of individuals undergoing IVF treatment.

METHODS

This study utilized a systematic review methodology to examine the motives for parenthood and the psychosocial and health factors experienced by women undergoing in vitro fertilization (IVF) treatment. By following predefined criteria and a systematic search strategy, this methodology ensures the inclusion of relevant studies and minimizes bias. To identify relevant studies, a comprehensive search

was conducted in electronic databases and other sources. The databases used for the search included Google Scholar, Tandfonline, Medrxiv and PubMed. The search terms used were "woman psychology IVF," "IVF psychology," and "IVF woman." In addition to the electronic search, a manual search was performed by examining the reference lists of included studies to identify any additional relevant articles.

It is important to acknowledge the limitations of this systematic review. The inclusion of only English and Greek language studies may introduce language bias. Additionally, the search was limited to specific databases, and relevant studies published in other languages or in non-indexed sources may have been missed. Despite these limitations, the systematic review provides valuable insights into the motives for parenthood and the psychosocial and health factors experienced by women undergoing IVF.

Studies were selected based on predefined inclusion and exclusion criteria. To be included in the systematic review, studies had to meet the following criteria:

- Include woman between the ages of 18 and 50 who had undergone IVF treatment.
- Focus on the psychosocial and health factors experienced by women undergoing IVF.
- Present original research with sufficient detail on methods and results.
- Written in English or Greek.
- Published in peer-reviewed journals.

Studies that did not meet these criteria were excluded from the review.

The following flow chart (Figure 1) describes the strategy of selecting studies included in the specific systematic review.

RESULTS

During the identification phase, a total of 2,219 records were identified from various databases and registers, including Google Scholar, PubMed, Tandoinline, and Medrxiv. To ensure data integrity, 1,200 duplicate records were removed, and an additional 500 records were marked as ineligible. Subsequently, 519 records underwent screening, and 269 reports were sought for retrieval. Among the screened records, 200 were excluded due to methodological limitations, and 50 were excluded due to indirect evidence or research. Moreover, 180 reports were not retrieved and independently reviewed by another reviewer. Out of the remaining 89 reports assessed for eligibility, 30 were excluded based on methodology, and 45 were excluded due to the year of publication. Ultimately, a total of 13 reports were included in the review.

This systematic review analyzed 13 studies that investigated various aspects of the psychological factors associated with in vitro fertilization (IVF) treatment. The studies examined the mental state of women participating in IVF programs, the effects of psychological interventions on mental health and treatment outcomes, predictors of

psychological distress in patients undergoing IVF, Yakupova et al. (2015) investigated the mental well-being of women in IVF programs. The results showed no significant differences in mental well-being between women with IVF pregnancies and those who conceived naturally. However, both groups experienced increased anxiety levels during the second and third trimesters, which were attributed to experiences of reproductive loss and physical problems. The study also highlighted the importance of professional employment and flexible behavior in contributing to self-confidence and mental stability among women undergoing IVF.

Hilla Haelyon’s qualitative study explored the psychological needs of women undergoing IVF treatment. The findings suggested that different women exhibited distinct approaches to their emotional and bodily experiences during the treatment process. While some women separated these aspects, others integrated them, highlighting the individual variability in coping strategies.

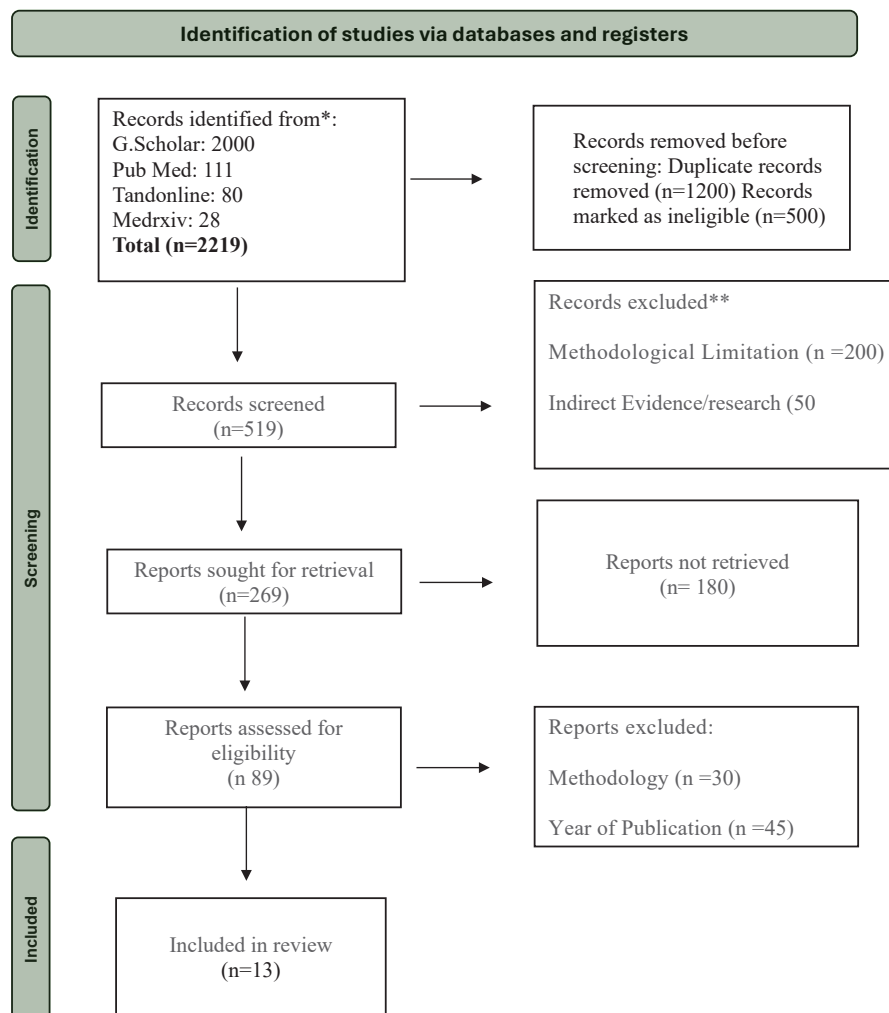
A randomized controlled trial conducted by Rahim et al. (2021) investigated the effects of hope-oriented group

counseling on the mental health and quality of life of infertile women with failed IVF cycles. The intervention group showed significantly lower stress and depression scores compared to the control group. Furthermore, the intervention group demonstrated higher quality of life scores. The results suggest that hope-oriented group counseling can have a positive impact on the mental well-being of women facing IVF challenges.

Limor Dina G. (2016) examined satisfaction with IVF treatment and the experiences of both patients and professionals involved in the process. The study revealed that overall, infertile patients were satisfied with the care they received. Additionally, demographic variables and psychological factors were found to be associated with patient satisfaction with IVF treatment. These findings highlight the importance of considering various factors that contribute to patients’ satisfaction and well-being during the IVF journey.

Yuan An et al. (2012) conducted a prospective study to evaluate the relationship between psychological stress,

Figure 1: Flow diagram of the research strategy according to PRISMA



Author & Date	Title	Aim	Method	Subjects	Results
Yakupova et al. (2015)	The mental state of women with an IVF pregnancy	Investigated mental well-being in pregnant women with IVF and naturally conceived pregnancies	Cross-sectional study Questionnaire (self-assessment)	224 pregnant women in the second and third trimesters, including 62 with IVF pregnancies and 62 with natural pregnancies	No significant differences in mental well-being between IVF and natural pregnancy groups. Increased anxiety levels observed in the second and third trimesters, associated with reproductive loss and physical problems. Professional employment and flexible behavior contributed to self-confidence and mental stability.
Hilla Haelyon (2010)	The psychological needs of women undergoing IVF treatment	Explored the experiences and coping strategies of Israeli women undergoing IVF treatment	Cross-sectional study Qualitative-semi-structured interview	30 Israeli women undergoing IVF treatment for a first pregnancy, aged 23 to 42	Women fell into categories of 'obeying-the-treatment-routine' or 'negotiating' in terms of separating or re-uniting their emotional and bodily experiences.
Rahim et al. (2021)	Effect of Hope-oriented group counseling on mental health of infertile women with failed IVF cycles: a randomized controlled trial	Examined the effects of hope-oriented group counseling on stress, depression, anxiety, and quality of life in infertile women with failed IVF cycles	Randomized controlled trial	60 women with failed IVF cycles visiting an infertility clinic in Iran	The intervention group showed significantly lower levels of stress and depression, higher quality of life, and no significant difference in anxiety compared to the control group.
Limor Dina G. (2016)	Satisfaction with in vitro fertilization treatment: patients' experiences and professional perceptions	Assessed patient satisfaction and professionals' perceptions of IVF treatment	Cross-sectional study Questionnaire: SPSS statistical analysis	204 patients and 19 fertility professionals from 8 public IVF units in Israel	Overall, infertile patients were satisfied with the care they received. Patient satisfaction with IVF was correlated with demographic variables and psychological factors.
Yuan An et al. (2012)	Relationship between psychological stress and reproductive outcome in women undergoing in vitro fertilization treatment: Psychological and neurohormonal	Evaluated the psychological stress, neurohormonal changes, and reproductive outcome during IVF treatment	Prospective study	264 women undergoing IVF or intracytoplasmic sperm injection (ICSI)	Non-pregnant women reported higher anxiety and depression scores compared to the pregnant group. Lower levels of norepinephrine and cortisol were found in women with successful treatment. State Anxiety scores were negatively correlated with live birth rate, and positively associated with serum norepinephrine and cortisol values.

(Continued)

Author & Date	Title	Aim	Method	Subjects	Results
David B. et al. (2021)	Psychological experience and coping strategies of patients in the Northeast US delaying care for infertility during the COVID-19 pandemic	Investigated the psychological experience and coping strategies of patients delaying care for infertility during the COVID-19 pandemic	Cross-sectional cohort patient survey using an anonymous, self-reported, web-based platform (REDCap)	734 patients	Prioritizing pre-treatment screening for psychological distress and employing a patient-centered approach to care is crucial in the context of delaying infertility treatment during the COVID-19 pandemic.
Aimagambetova et al. (2020)	The effect of psychological distress on IVF outcomes: Reality or speculations?	Investigated the impact of psychological distress on IVF outcomes	Prospective cohort study using questionnaires	304 infertile females in three different cities in Kazakhstan	Higher levels of stress, anxiety, and depression are observed in IVF patients compared to the general population. Increased infertility-related stress is associated with lower IVF success rates. Specific psychological interventions are needed to improve IVF success rates for all infertile women.
Heredia et al. (2020)	Effectiveness of a psychological intervention focused on stress management for women prior to IVF	Evaluated the effectiveness of a psychological intervention focused on stress management in women preparing for IVF	Pre-post study with two groups	Two groups of n=26	The intervention group showed decreased levels of anxiety and emotional imbalance, as well as enhanced quality of life. Those who achieved successful IVF reported a greater decrease in anxiety.
Herzberger M. (2019)	A prospective study of physiological and psychological stress in women undergoing IVF	Investigated the effects of physiological and psychological stress on fertility outcomes in women undergoing IVF	Prospective study	72 patients undergoing IVF in 2017 and 2018	Salivary cortisol concentrations increased during treatment. Stress scale scores increased during ovarian stimulation. Salivary cortisol and stress scale were not related to subsequent embryo transfer, fertilization rate, embryo quality, or clinical pregnancy rate.
Haemmerli Keller et al. (2018)	Treatment-related psychological stress in different in vitro fertilization therapies with and without gonadotropin stimulation	Explored treatment-related psychological stress in different IVF therapies	Validated psychological questionnaires filled in online before, during, and after completed treatment cycle(s)	57 NC-IVF and 62 cIVF patients	Similar clinical pregnancy rates were observed between natural cycle IVF and conventional IVF. NC-IVF patients had lower levels of depression and higher treatment satisfaction. Psychological distress increased during conventional IVF treatment and decreased during natural cycle IVF treatment.
Koumparou M. et al. (2021)	Stress management and In Vitro Fertilization (IVF): A pilot randomized controlled trial	Evaluated the psychological effect of a stress-management intervention in women undergoing IVF	Quantitative research with questionnaires and statistical analysis	144 women participated in the study with 74 in the intervention group and 70 women in the control group	The intervention group showed a significant decrease in distress levels, indicating a positive effect on participants' mental health.

(Continued)

Author & Date	Title	Aim	Method	Subjects	Results
Uschi Van den Broeck et al. (2010)	Predictors of psychological distress in patients starting IVF treatment: infertility-specific versus general stress	Explored predictors of psychological distress in patients starting IVF treatment	Validated self-report questionnaire measuring various psychological characteristics	106 women and 102 men before starting the first IVF/ICSI treatment at a university hospital	General psychological characteristics, coping styles, personality traits, and infertility-specific concerns were found to be important predictors of psychological distress in patients starting IVF treatment.

neurohormonal changes, and reproductive outcomes in women undergoing IVF. The findings indicated that non-pregnant women reported higher anxiety and depression scores compared to pregnant women. Successful treatment was associated with lower levels of norepinephrine and cortisol. Moreover, state anxiety scores were negatively correlated with the live birth rate. These results emphasize the potential impact of psychological stress on IVF outcomes.

During the COVID-19 pandemic, many patients delayed infertility treatment, leading to psychological distress. David B. et al. (2021) investigated the psychological experiences and coping strategies of patients in the Northeast US who postponed care. The study recommended pretreatment screening for psychological distress and the adoption of patient-centered approaches to address the psychological challenges faced by patients during treatment pauses.

A systematic review by Alicja Malina et al. (2017) highlighted the psychological and emotional difficulties experienced by couples undergoing IVF. The study emphasized the need for further research on the effect of supportive social interactions on the well-being and functioning of couples throughout the IVF process.

Aimagambetova et al. (2020) conducted a prospective cohort study to assess the effect of psychological distress on IVF outcomes in infertile females. The findings indicated that stress, anxiety, and depression rates were higher among IVF patients compared to the general population. Additionally, the study revealed that higher levels of infertility-related stress were associated with lower IVF success rates, suggesting the importance of specific psychological interventions to improve IVF outcomes.

Heredia et al. (2020) evaluated the effectiveness of a psychological intervention focused on stress management for women undergoing IVF. The intervention group demonstrated decreased anxiety levels, emotional imbalance, and perceived enhancements in quality of life. Moreover, participants who received the psychological intervention and achieved successful IVF had greater reductions in anxiety levels, indicating the potential benefits of stress management interventions for women undergoing infertility treatments.

Koumparou et al. (2021) conducted a pilot randomized controlled trial to evaluate the psychological effect of a stress-management intervention in women undergoing IVF.

The study reported a positive effect of the intervention on the participants' mental health, suggesting its potential usefulness in improving the well-being of women undergoing infertility treatments.

The study by Uschi Van den Broeck et al. (2010) examined the predictors of psychological distress in patients starting IVF treatment. The findings highlighted the importance of general psychological characteristics, such as coping styles, personality traits, and relationship dynamics, in predicting psychological distress. These factors were found to have a greater impact on psychological well-being than infertility-specific concerns.

DISCUSSION

Collectively, the findings from the systematic review indicate several important aspects related to the psychological factors associated with in vitro fertilization (IVF) treatment.

First, the mental well-being of women participating in IVF programs was explored. It was found that there were no significant differences in mental well-being between women with IVF pregnancies and those who conceived naturally. However, both groups experienced increased anxiety levels during the second and third trimesters, which could be attributed to reproductive loss and physical problems. The study also highlighted the positive impact of professional employment and flexible behavior on self-confidence and mental stability among women undergoing IVF.

The psychological needs of women undergoing IVF were examined, revealing that different women exhibited distinct approaches to their emotional and bodily experiences during the treatment process. While some women separated their emotions from their bodily experiences, others integrated them.

The effectiveness of hope-oriented group counseling in improving the mental health and quality of life of infertile women with failed IVF cycles was demonstrated. The intervention group showed lower stress and depression scores and higher quality of life compared to the control group.

Patient satisfaction with IVF treatment was found to be generally high. Demographic variables and psychological factors, such as coping styles and personality traits, were identified as significant predictors of patient satisfaction.

Psychological stress was found to have implications for

reproductive outcomes in women undergoing IVF. Non-pregnant women reported higher anxiety and depression scores compared to pregnant women, and successful treatment was associated with lower levels of stress hormones. State anxiety scores were negatively correlated with the live birth rate.

The COVID-19 pandemic had an impact on the psychological experiences of patients delaying infertility care. It was recommended to conduct pretreatment screening for psychological distress and adopt patient-centered approaches to address the psychological challenges faced by patients during treatment pauses.

IVF was identified as a source of psychological and emotional difficulties for couples trying to conceive. The importance of studying the effects of supportive social interactions on the functioning of couples undergoing IVF was emphasized.

Higher rates of stress, anxiety, and depression were observed among IVF patients compared to the general population. Additionally, higher levels of infertility-related stress were associated with lower IVF success rates, highlighting the need for specific psychological interventions to improve outcomes.

The effectiveness of stress management interventions in reducing anxiety levels and enhancing quality of life in women undergoing IVF was demonstrated. Such interventions showed potential benefits, particularly among those who achieved successful IVF.

General psychological characteristics, including coping styles, personality traits, and relationship dynamics, were found to be more influential in predicting psychological distress than infertility-specific concerns in patients starting IVF treatment.

Taken together, these findings underscore the importance of addressing psychological factors, providing support and counseling, and implementing stress management interventions throughout the IVF process. By attending to the psychological well-being of patients, it is possible to enhance their experience, improve treatment outcomes, and promote overall mental health in the context of IVF treatment.

Overall, the results of these studies provide valuable insights into the psychological aspects of IVF treatment. They underscore the need for psychological interventions to support individuals and couples throughout the IVF process, address stress and anxiety, and improve mental well-being. The findings also highlight the importance of considering individual differences and tailoring interventions to meet the unique needs of patients undergoing IVF. Further research is warranted to explore longitudinal effects, develop evidence-based interventions, and promote the overall well-being of individuals and couples undergoing fertility treatment.

CONCLUSIONS

This systematic review provides valuable insights into the psychological aspects of in vitro fertilization (IVF) treatment.

The findings highlight the importance of considering and addressing the psychological well-being of individuals undergoing IVF, as it has significant implications for their experience and treatment outcomes.

The review reveals that women participating in IVF programs experience increased anxiety levels during the second and third trimesters, irrespective of whether they conceived through IVF or naturally. It emphasizes the need to provide support and interventions to address the emotional challenges associated with reproductive loss and physical problems during pregnancy.

Psychological interventions, such as hope-oriented group counseling and stress management programs, have demonstrated positive effects on the mental health and quality of life of women undergoing IVF. These interventions can help alleviate stress, reduce anxiety levels, and enhance overall well-being, particularly for individuals facing failed IVF cycles.

Patient satisfaction with IVF treatment was generally high, but it was influenced by various factors, including demographic variables and psychological characteristics. Understanding these factors can guide healthcare providers in tailoring their care to meet the unique needs and preferences of each patient, thereby improving patient satisfaction and treatment outcomes.

The impact of psychological stress on reproductive outcomes in IVF was evident, with higher stress levels being associated with lower IVF success rates. This underscores the importance of addressing psychological distress and implementing specific psychological interventions to optimize IVF outcomes.

The COVID-19 pandemic posed additional challenges for individuals undergoing IVF, leading to psychological distress and treatment delays. The review highlights the importance of implementing strategies to support patients during such unprecedented circumstances, including pretreatment screening for psychological distress and patient-centered approaches to care.

Overall, the findings emphasize the significance of a comprehensive approach to IVF treatment that addresses the psychological well-being of patients. By integrating psychological support, counseling, and stress management interventions, healthcare providers can enhance the overall experience of patients, improve treatment outcomes, and promote their mental health throughout the IVF journey.

Further research is needed to delve deeper into the psychological aspects of IVF treatment, such as the long-term effects of psychological interventions, the impact of social support on patient well-being, and the development of evidence-based interventions tailored to individual needs. By continuously advancing our understanding of the psychological dimensions of IVF, we can continue to improve the care and support provided to individuals and couples undergoing this transformative reproductive technology.

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CONFLICTS OF INTEREST

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.