

ARTICLE

Quality of Life of Infertile Couples Undergoing Medically Assisted Procreation (PMA) With Gamete Donation. A Scoping Review

Bernadette Ilardi ^a, Carloluigi Bonetti ^b, Valentina Cerrone ^c, Mohammed N. Shariff ^d, Angela Prendin ^e, Vincenzo Andretta ^{f,*}, Marco Cascella ^f

^a Obstetrics and Gynecology Unit, Federico II University Hospital, Naples, Italy

^b Stroke Unit, Federico II University Hospital, Naples, Italy

^c Oncology Unit, San Giovanni di Dio e Ruggi D'Aragona University Hospital, Salerno, Italy

^d Department of Artificial Intelligence and Data Science, Rajalakshmi Institute of Technology, Chennai, India

^e Palliative Care and Antalgic Therapy/Pediatric Hospice, University Hospital of Padua, Padua, Italy

^f Department of Medicine, Surgery and Dentistry "Scuola Medica Salernitana", University of Salerno, Baronissi, Italy

Abstract

Introduction: The drop in the birth rate, especially in the Western world, has resulted in a widespread battle with infertility. The declining fertility rates have led to an increasing dependence on assisted reproductive technologies (ART). These methods provide hope for infertile couples but have notable emotional and psychological effects, especially when using heterologous techniques with gamete donation.

Aim: To comprehend the issues and challenges experienced by infertile couples using medical assistance for procreation with gamete donation and to outline the benefits of this treatment.

Material and methods: A scoping review was carried out following the PRISMA-ScR guidelines, utilizing MedLine/ Pubmed, Google Scholar, and Web of Science databases. **Results:** The review included 9 out of the 9540 articles found. Moderate to severe anxiety was reported in up to 86.5 % of couples, while psychological support improved emotional states and reduced stress in 32 % of couples.

Conclusion: Thoughtful guidance of the couple receiving the donation is crucial to minimize the adverse emotional effects and offer thorough psychological assistance, guaranteeing that healthcare facilities meet all the patient's requirements.

Keywords: Infertility, Couple, Gamete donation, PMA (medically assisted procreation), Psychological support

1. Introduction

The increasing infertility epidemic among Western societies can be attributed to women bearing fewer children than in decades past. Specifically, the average number of children per female has reduced drastically from 3.2 offspring in nineteen ninety to a mere 2.3 by the year two thousand twenty [1]. This decline is thought to stem from a host of causative influences including environmental pollution, worsening health issues faced by prospective parents, and socioeconomic factors

affecting family planning decisions. Meanwhile, Sub-Saharan Africa continues witnessing high fertility, with 4.7 children per woman on average, whereas some parts of Eastern Asia and Southern Europe have markedly low rates such as one point three little ones. Most recently, Eurostat reported Malta, Spain, and Italy as having the smallest population growths according to their figures of one point thirteen, one point nineteen, and one point twenty-four respectively for two thousand twenty. As a result, there has been a rise in the utilization of Medically Assisted Procreation (PMA). These

Received 7 June 2024; revised 29 December 2024; accepted 8 January 2025.

Available online ■ ■ ■

* Corresponding author.

E-mail address: vandretta@unisa.it (V. Andretta).

<https://doi.org/10.82035/tranmed.mcasella2025>

2239-9747/© 2025 Università di Salerno. This is an open access article under the CC BY 2.5 license (<https://creativecommons.org/licenses/by/2.5/>).

therapies can be mentally exhausting, frequently causing feelings of guilt, frustration, fear, worry, and sadness [2–4]. Although facing obstacles, reproductive biotechnologies currently facilitate approximately 1500 births daily for infertile couples in the Western world [5–10].

Donating eggs gives couples with repeated failures a sense of hope, despite the emotional complexity and difficult choices involved [2]. Information from the Italian Ministry of Health indicates an increase in gamete donation cycles, with 9686 cycles recorded in 2019, accounting for 9.8 % of all PMA cycles. In Italy in 2019, 78,618 couples received treatment, leading to 3.4 % of total births being attributed to these interventions. Legal modifications since 2014 resulted in around 10,000 instances of heterologous fertilization in Italy from 2014 to 2021, with an anticipated increase.

The emotional strain caused by infertility, known as “infertility stress,” often requires psychological support [11]. Only 47 % of Italian PMA centers have a full-time psychologist on staff, viewing counseling services as an additional rather than essential service [12–15]. Collaborating among professionals is key to improving psychological support in PMA therapies. Infertility, defined as the inability to conceive after a year of consistent unprotected sex, affects both men and women. It can be classified as primary or secondary based on various causes [16,17]. Approximately 48 million couples and 186 million individuals worldwide are impacted, with developed nations having a prevalence rate of 15–20 % [18–25]. Male factors contribute to 38 % of infertility cases. Assisted Reproductive Technology (ART) methods such as IVF are used to address infertility [14], but success rates are generally low, necessitating multiple attempts [26–30]. The emotional and physical demands of ART require comprehensive psychological support [17,31–37].

Psychological stress related to infertility increases the risk of mental health issues. Counseling is crucial for individuals and couples navigating infertility and ART treatments. Quality of life is significantly impacted by infertility and its treatments, as assessed by the FertiQoL tool [32–34,38–41]. Additional support is requested for families utilizing donor gametes to address emotional challenges [42–48].

1.1. Objective of the study

The purpose of this research was to comprehend the issues and challenges experienced by infertile couples receiving medical assistance in reproducing with donated gametes and to outline the benefits of this treatment.

2. Material and methods

A scoping review was conducted in adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist [49]. The research question was formulated based on the study's objective, defining the target population, intervention, and outcome.

The purpose of the scoping review was to assess the psychosocial factors impacting infertile couples who are undergoing gamete donation. To accomplish this, a research query was formulated using the Problem-Intervention-Outcome (PIO) approach:

- Population: Infertile couples
- Intervention: Medically assisted procreation with gamete donation
- Outcome: Quality of life

Subsequently, a Facet Analysis was performed based on this question (Table 1).

Table 1. Facet analysis of this scoping review.

Population	Intervention	Outcome
Male infertility	Medically assisted reproduction	Quality of life
Female infertility	Oocyte donation	Psychological well-being
Infertility	Assisted reproductive techniques	Lifestyle
Female sterility	Reproductive techniques	Emotions
Male sterility	Reproductive medicine	Social perception
Sterility	In vitro fertilization	
Infertile couple	Artificial insemination	
Sterile couple	Donor conception	
	Insemination artificial heterologous	
	Insemination heterologous	
	Donor artificial insemination	
	Heterologous insemination	
	Riproduttive techniques assisted	

2.1. Research question

This review was planned to answer the following research question:

- What are the issues and challenges experienced by infertile couples undergoing medically assisted procreation (PMA) with gamete donation, and what are the benefits of this treatment?

2.2. Search strategy

A search string elaborated on different databases (i.e., MedLine/Pubmed, Google Scholar, and Web of Science) included:

((male infertility OR female infertility OR infertil* OR steril* OR sterile couple OR infertile couple OR sterility OR female sterility OR male sterility) AND (medically assisted reproduction OR oocyte donation OR assisted reproductive techniques OR reproductive techniques OR reproductive medicine OR in vitro fertilization OR artificial insemination OR donor conception OR insemination artificial heterologous OR insemination heterologous OR donor artificial insemination OR heterologous insemination OR reproductive techniques assisted) AND (quality of life OR psychological well-being OR life style OR emotion OR social perception well being OR stress* OR anxi* OR depress* OR personalit*)).

No filters were included in the search because all updates were of interest.

The selection was conducted using the inclusion and exclusion criteria, as reported in [Table 2](#).

2.3. Data collection

The data extraction process was conducted using a standardized form created in Microsoft Excel to

ensure consistency and comprehensiveness across all included studies. The extracted information captured essential study details, including the first author's name and the country where the study was conducted, as well as the study design, which ranged from cross-sectional and cohort studies to qualitative analyses. Key demographic details of the sample were also recorded, such as the size and characteristics of participants, including distinctions between males, females, and couples. Additionally, the type of medically assisted procreation involving gamete donation, such as oocyte donation or sperm donation, was noted. For each study, the primary variables of interest, including quality of life, emotional state, and psychological support, were identified. Finally, the main results relevant to the review's objectives were summarized, ensuring all findings were systematically organized and ready for thematic synthesis.

This scoping review protocol was registered with the Open Science Framework (OSF) to ensure transparency and reproducibility available on <https://doi.org/10.17605/OSF.IO/95VRK>.

2.4. Risk of bias

As this is a scoping review, no formal risk of bias assessment was conducted. This approach aligns with the established guidance provided by Arksey and O'Malley in their seminal work on scoping studies, which emphasizes that the purpose of scoping reviews is to map the existing evidence comprehensively rather than to appraise the methodological rigor of included studies. The decision not to assess the risk of bias ensures the inclusion of a wide range of evidence, capturing both high-quality studies and those that contribute to identifying gaps in knowledge [50].

Table 2. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
1. Studies evaluating the emotional state of women/men candidates for or undergoing gamete donation.	1. Studies investigating emotional aspects of same-sex couples.
2. Studies analyzing couples undergoing gamete donation.	2. Studies involving couples approaching adoption.
3. Studies summarizing the emotional effects accompanying PMA with gamete donation.	3. Studies related to transgender aspects.
4. Evaluation of the psycho-emotional state of couples undergoing gamete donation.	4. Studies on disclosure aspects.
5. Quality of life of couples undergoing gamete donation.	5. Studies investigating child health or relationships with children.
6. Studies evaluating psychological support interventions in heterologous PMA.	6. Studies on surrogate pregnancy.
7. Studies investigating the emotional state of women/men in heterologous PMA.	7. Studies investigating symptoms during Covid-19.
8. Studies investigating the quality of life in heterologous PMA.	8. Studies on birth or pregnancy rates.
	9. Studies involving donor aspects or donor experiences.
	10. Studies involving heterologous PMA post-cancer history.
	11. Studies relating psychological state to ART outcomes.

3. Results

A total of 9540 records were identified through the electronic search process. After screening titles and abstracts, 7239 articles were excluded based on predetermined criteria. Subsequently, 20 articles underwent full-text review, with 15 articles being excluded due to failure to meet the inclusion criteria. Finally, 9 articles met the inclusion criteria and were included in the systematic search [29,45,46,51–56].

The results were synthesized using thematic analysis to identify recurring themes such as emotional distress, quality of life, psychological support, social stigmatization, and sexual dysfunction. Quantitative data were summarized where available to enhance the clarity of findings. For

example, anxiety was reported in 86.5 % of participants in one study, while psychological support was found to improve emotional outcomes in 32 % of couples in another study.

Fig. 1 provides a visual representation of the study selection process. During the screening phase, 1081 records were excluded for specific reasons: 380 records did not analyze the quality of life in couples undergoing heterologous IVF, 250 were dissemination articles in heterologous ART, 200 focused on same-sex couples, 100 explored the emotional state of the donor, and 151 examined factors related to the development of children born from gamete donation.

The 9 selected papers were analyzed in terms of inclusion criteria, methodology, results, and bibliography (Table 3).

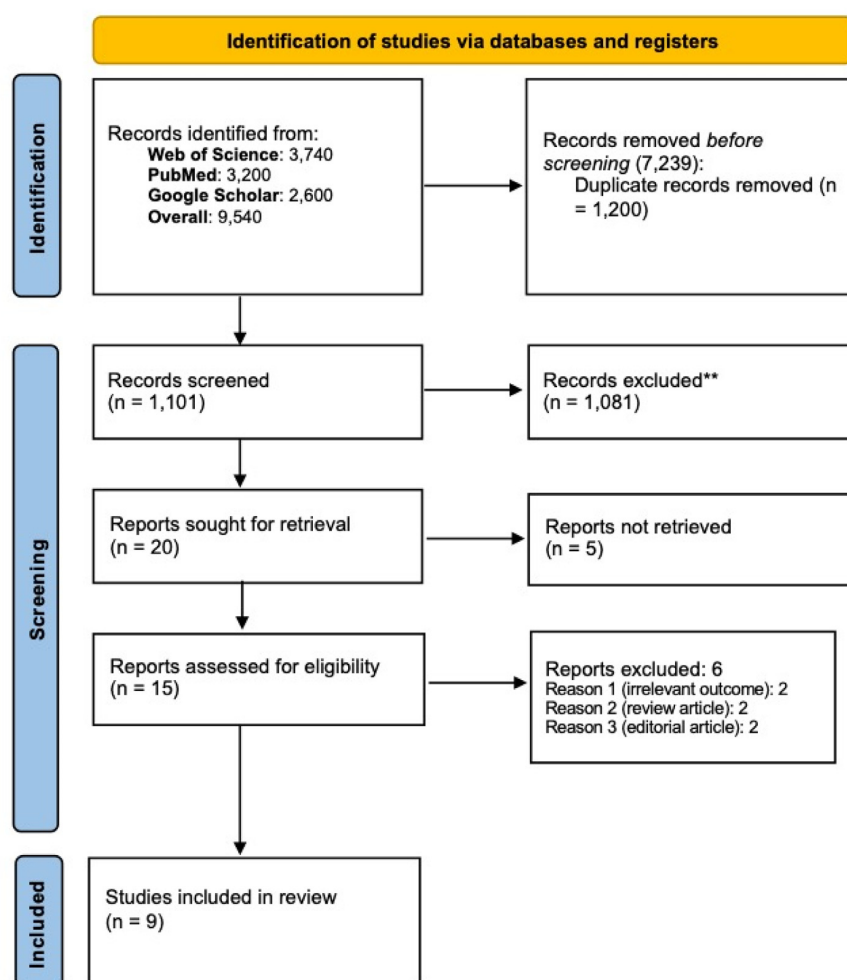


Fig. 1. PRISMA Flowchart [49] of studies selection. ** During the screening phase, 1081 records were excluded for various reasons. Specifically, 380 records were excluded because they did not analyze the quality of life in couples undergoing heterologous IVF, 250 were dissemination articles in heterologous ART, 200 focused on same-sex couples, 100 explored the emotional state of the donor, and 151 examined factors related to the development of children born from gamete donation.

Table 3. Characteristics of studies included in this scoping review.

Author-Country	Design	Sample	Type of Heterologous PMA	Main Variable	Result
Lisovskaya (2017)	Cohort	200 ♀	Oocyte donation	Emotional state	86.5 % with moderate/high anxiety, frustration, and rigidity. 23 % compliant with treatment.
Montagnini (2022)	Retrospective cohort	60 ♂♀	Oocyte donation	Emotional state, Psychological support	32 % with a positive emotional state, 23 % with an unfavorable emotional state, 45 % without evident classification
Madero (2017)	Cross-sectional	432 ♂♀	Oocyte donation	QoL, Depression	♀ FertiQoL = 70.1 ♂ FertiQoL = 78.7, ♂ with lower anxiety scores compared to ♀
Bagheri (2020)	Descriptive qualitative	17 ♀	Oocyte donation	Emotional state	5 themes: threatened marital life, lack of support, religious beliefs, psychosocial damage, and damaged female identity.
Hershberger (2021)	Descriptive qualitative	14 ♂♀	Oocyte and sperm donation	Psychological counseling	Appropriate language in short personal stories told by parents.
Ghelich-Khani (2021)	Prospective qualitative	20 ♂♀	Oocyte donation	Psychosocial experience	Experiences of distressing psychological symptoms, social stigmatization, and negative coping mechanisms.
Salevaara (2017)	Prospective longitudinal	26 ♀	Oocyte donation	Mental health	Anxiety in mothers undergoing oocyte donation is lower than in mothers with natural conception. Mental health problems in fathers from donation do not differ from those of fathers with natural conception.
Le Gof (2023)	Prospective observational monocentric	79 ♂♀	Sperm donation	Sexual dysfunction	♀ = 39.3 % with sexual dysfunctions (SD), ♂ = 26.5 % with erectile dysfunction (ED)
Visser (2016)	Prospective qualitative	24 ♂♀	Sperm donation	Psychosocial support of couples	During counseling, parents sometimes felt selected for their suitability for parenthood rather than guided, and thus felt discouraged from raising important topics.

All the studies analyzed included couples who were candidates for, or who had made, donation, evaluating the quality of life and emotional state of the woman and her partner. A total of 872 women/couples were included.

In summary, the included studies analyze and describe the quality of life of the couples studied in the following ways:

3.1. Emotional state

The emotional state of couples undergoing heterologous ART showed moderate-severe anxiety [51–53]. Anxiety is more marked in the male partner than in the female partner [52]. However, mental health symptoms are less marked in heterologous ART than in IVF/ICSI [46]. Heterologous ART is also associated with increased incidence of frustration, aggression, and neuropsychic stress [51], generalized anxiety disorder [53], and anguish [54]. Couples undergoing IVF with donated oocytes in the cross-border phase have an overall good quality of life and mental health. However, their QoL and mental health differ depending on their country of origin [52]. The category of anguish was modeled based on the subcategories of destruction of self-esteem, anxiety and stress, depression, and spiritual discouragement [54]. Infertility is usually accompanied by great psychological sadness called ‘infertility stress’ [53], and ART is associated with a source of stress with a significant impact on mental health [51,53].

3.2. Social stigmatization

Five themes were assessed, including threatened marital life, lack of a supportive situation, religious beliefs, psychosocial damage, and damaged female identity [54], finding that assisted fertilization techniques have a significant impact on the marital relationship of infertile women [53].

3.3. Impact of psychological support

Psychological support before and during heterologous ART improves the emotional state of the couple, with improved quality of life and reduced risk of depression [29,45,56]. Low compliance with psychotherapeutic treatment was highlighted (23 % of women underwent follow-up) [51]. The rate of abandonment of the procedure decreased for all couples who were followed over time with follow-up and psychological counseling compared to couples who did not receive psychological counseling [29].

3.4. Sexual dysfunction

Heterologous PMA is associated with a higher incidence of sexual dysfunction in both partners, with a significant impact on the couple's sexual life [55].

3.5. Parental awareness

Partners' awareness of the heterologous PMA procedure is low, and therefore it is necessary to create targeted help to provide support to the couple [45].

4. Discussion

This scoping review focused on the emotional and psychological impacts of medically assisted procreation using gamete donation. Notably, the findings highlight significant emotional challenges such as anxiety, frustration, and reduced quality of life, alongside the benefits of psychological support in improving emotional well-being for affected couples.

This research outlined the impact on emotions, worries, and quality of life for couples going through heterologous PMA. The primary goal was to give insights into the emotional distress experienced by these patients, assessing how psychotherapy and psychological monitoring can help lessen anxiety and depression linked to the treatment. Nine research studies were included, primarily prospective cohort studies or surveys conducted on the population.

The analysis showed that using different PMAs negatively affects couples by causing emotional distress and anxiety, leading to low adherence to psychological treatment. Women who got pregnant through oocyte donation experienced lower levels of mental health symptoms and anxiety than women who got pregnant naturally, and they also had fewer sleep problems and social issues compared to women who underwent IVF/ICSI and those who got pregnant naturally [46]. Women who conceived with OD (oocyte donation) may experience fewer mental disorders and health issues due to their thorough readiness for parenthood and the fulfillment of a seemingly unattainable dream. When undergoing OD to become parents, the pregnancy is well thought out, and the minimal mental health issues experienced by OD mothers may indicate contentment after completing treatment following fertility struggles [46]. Becoming a parent involves significant psychosocial reorganization, along with learning new skills and taking on new responsibilities [57].

Simultaneously, the journey to parenthood for OD parents includes significant emotional upheaval due to the absence of a maternal genetic bond and disrupted family lineage, as well as concern that a mother might not recognize herself in her child [58]. The preparation of OD couples before pregnancy could be essential for reducing their stress levels.

Several research projects have examined the sexual aspects of couples who are experiencing infertility [59–62]. A meta-analysis [63] found that many women (43–90 %) and men (48–58 %) experience sexual dysfunction (SD). Potential causes linking sexual dysfunction and infertility include planned sexual activity, concerns about unintended pregnancy, and determining the root cause of infertility. Premature ejaculation and occasional psychological anejaculation could also be linked to infertility in 90 % of men at some stage of infertility treatment [61]. More studies are needed to assess psychological treatments for sexual dysfunction and ways to enhance sexual function [55].

In infertile heterosexual couples using ART, those who choose donor sperm may face unique challenges compared to those using their partner's sperm, as accepting non-biological parenthood can be a significant obstacle to overcome. There has been limited research on how ART with donor sperm affects the sexual relationships of infertile couples [55].

There is a lack of information on how parents perceive the importance of psychosocial counseling. Visser et al. [56] state that it is probably best to provide psychosocial support separately from conducting psychosocial screenings to determine treatment eligibility. Even though oocyte donation has been linked to various accomplishments, it can also result in several psychological issues for the women receiving the donated eggs [56]. Recipients of oocytes encounter difficulties that may persist following treatment success. Social restrictions related to fertility definitions result in decreased self-confidence due to the necessity of utilizing non-self-oocytes, requiring a donor in the fertility treatment procedure. A woman's realization of her incapacity to fulfill her gender role as a mother has a detrimental effect on her quality of life [54].

The insights and stories shared by American parents who have used gamete donations, as well as information found in scientific studies and clinical practices, offer valuable context that can be turned into material for storyboarding. This process is essential in creating decision support tools that incorporate parents' narratives, testimonies, and experiences to shape the text, images, and interactive features. Understanding the needs of these

families is greatly aided by the nuances, stories, and illustrative quotes that parents use to narrate. Understanding the diverse methods parents employ to enhance their articulate discussions is beneficial and strengthens the foundation for decision assistance to support parents in their significant conversations [64].

Annually, thousands of couples in Europe travel across national borders in search of assisted reproductive technology, especially egg donation, mostly due to legal limitations in their own countries. The majority of studies indicate that infertility and ART affect patients' mental well-being and overall quality of life. Opting for reproductive care overseas can increase emotional and practical challenges. If ambivalent emotions are not dealt with, they can prevent the tackling of issues and difficulties that come with being a parent. Hence, it is valuable to consider the timing from when the medical recommendation is made to when the choice to engage in the treatment is made. A longer waiting period before starting treatment is linked to improved adjustment to the chosen therapy, showing a higher level of acceptance of infertility [45]. This approval decreases the chances of the child's birth causing pain and disagreement within the family later [52].

Women receiving oocyte donation treatment experience varying levels of anxiety, frustration, aggression, rigidity, and neuropsychic stress. Most of these women only partially adhere to the treatment. Therefore, the intermediate-term impact of multimodal psychotherapy helps enhance treatment adherence, decrease adverse mental conditions, and promote appropriate motivation for oocyte donation in fertilization programs [12].

Notably, couples who have undergone OD treatments in the past are more inclined to see psychosocial support as beneficial and to want it. Psychological support is not commonly offered at Italian ART centers as part of their usual services, despite the emotional impact of treatments focusing on the outcome rather than the underlying cause of infertility. In many centers, there is a lack of policies and procedures for psychological interventions, leading to unstructured use of counseling despite its availability in the treatment process. Doctors have also highlighted the importance of seeking guidance from psychologists before offering advice on decision-making and support counseling [51]. During psychosocial counseling, many parents perceive they are being judged for their parenting skills rather than supported, which hinders them from discussing important issues, like expressing their worries about their children rejecting them. They are worried that the counselor might think they are

not capable of raising a child conceived through donors if they express these worries.

4.1. Limitations of the scoping review process

This scoping review had several limitations. Firstly, the included studies varied significantly in design, ranging from qualitative studies to observational cohort studies, leading to challenges in synthesizing the data. Most studies relied on observational data without randomized controlled trials, making causal inferences difficult. Language bias was also present, as only English-language articles were included. Furthermore, the lack of standardized tools for measuring quality of life and emotional impacts made cross-study comparisons challenging. Finally, the review may have missed relevant literature due to limitations in search strategy or database coverage.

These findings highlight the challenges faced by couples receiving gamete donation treatment, underscoring the importance of psychological support in such situations [56]. The main strengths of the study were the quantity of studies considered, and the caliber of the studies included. Nevertheless, certain restrictions were also observed. Specifically, all the studies that were analyzed did not have a prospective randomized design. The findings of this assessment align with earlier reviews that have been published on the subject. Malina et al. [8] emphasized the importance of providing psychological support to couples going through PMA to decrease the chances of experiencing emotional distress.

5. Conclusion

This scoping review highlighted the negative impact on emotional well-being and relationships of couples using gamete donation. New research suggests that the genetic makeup of the baby can be influenced by the connection between the mother and the embryo, even without biological ties. It is essential to provide specific information and support to individuals considering assisted reproduction with a third party, as it presents enduring challenges. Families formed through donor conception require ongoing assistance. Comprehensive counseling is crucial for couples undergoing gamete donation to mitigate emotional consequences and offer necessary psychological support. Healthcare facilities should offer holistic care to address all patient needs. Couples using heterologous PMA experience significant psychological strain, which can be alleviated through psychological monitoring and therapy. However, the uptake of these services

is variable. Psychological support is crucial for couples undergoing heterologous PMA, and further multicentric studies are needed to explore their psychological dynamics and enhance the relevance of findings.

References

- [1] Di Spiezio Sardo A. Relazione del Ministro della Salute al Parlamento sullo stato di attuazione della legge contenente norme in materia di procreazione medicalmente assistita – anno 2021.
- [2] Peluffo MC. The emotional impact of infertility and fertility treatments on couples. *J Reprod Med* 2008;53(10):697–700.
- [3] Benyamini Y, Gozlan M, Kokia E. Women's and men's perceptions of infertility and their associations with psychological adjustment: a dyadic approach. *Br J Health Psychol* 2009; 14(Pt 1):1–16.
- [4] Blake L, Casey P, Readings J, Jadva V, Golombok S. “Daddy ran out of tadpoles”: how parents tell their children that they are donor conceived, and what their 7-year-olds understand. *Hum Reprod* 2014;29(5):968–76.
- [5] Hajela S. Coping with infertility: psychological and social considerations. *Int J Reprod Contracept Obstet Gynecol* 2016;5(6):1653–6.
- [6] Rooney KL, Domar AD. The impact of stress on fertility treatment. *Curr Opin Obstet Gynecol* 2016;28(3):198–201.
- [7] Gdańska P, Drozdowicz-Jastrzębska E, Grzechocińska B, Radziwiłł G. Anxiety and depression in women and men undergoing infertility treatment. *J Reprod Infant Psychol* 2017;35(5):504–17.
- [8] Malina A, Pooley JA. Psychological consequences of IVF fertilization - review of research. *Ann Agric Environ Med* 2017;24(4):554–8.
- [9] Massarotti C, Gentile G, Ferreccio C, Scaruffi P, Remorgida V, Anserini P. Impact of infertility and infertility treatments on psychological well-being of women. *Best Pract Res Clin Obstet Gynaecol* 2019;59:98–110.
- [10] Zurlo MC, Cattaneo Della Volta MF, Vallone F. Infertility-related stress and psychological health outcomes in infertile couples undergoing medical treatments: testing a multi-dimensional model. *Stress Health* 2018;34(3):274–83.
- [11] Bagheri M. Infertility stress: the role of psychological counseling during treatment. *J Family Reprod Health* 2020;14(4): 203–10.
- [12] Spoletini R. Psychological services in Italian PMA centers: a survey. *Ital J Gynaecol Obstet* 2022;34(3):155–9.
- [13] Gianaroli L. Infertilità di coppia. *S.I.S.Me.R.* 2017.
- [14] Dourou P, Gourounti K, Lykeridou A, Gaitanou K, Petrogiannis N, Sarantaki A. Quality of life among couples with a fertility related diagnosis. *Clin Pract* 2023;13:251–63.
- [15] Ombelet W. WHO fact sheet on infertility gives hope to millions of infertile couples worldwide. *Facts Views Vis Obgyn* 2020;12:249–51.
- [16] World Health Organization. Infertility. Available from: <https://www.who.int/fr/news-room/fact-sheets/detail/infertility>; 2020.
- [17] Scaravelli G, De Luca R, Vigiliano V, Bolli S, Spoletini R, Mazzola M, et al. Attività del Registro Nazionale Italiano della Procreazione Medicalmente Assistita. Dati 2020. 16° Report. Rome, Italy: Istituto Superiore di Sanità; 2022.
- [18] Goudakou M, Kalogeraki A, Matalliotakis I, Panagiotidis Y, Gullo G, Prapas Y. Cryptic sperm defects may be the cause for total fertilization failure in oocyte donor cycles. *Reprod Biomed* 2018;24:148–52.
- [19] American Society for Reproductive Medicine. Assisted reproductive technologies. A guide for patients. ASRM. Available from: www.fertilityanswers.com/wp-content/uploads/2016/04/assisted-reproductive-technologies-booklet.pdf.
- [20] Prapas Y, Petousis S, Panagiotidis Y, et al. Injection of embryo culture supernatant to the endometrial cavity does not

- affect outcomes in IVF/ICSI or oocyte donation cycles: a randomized clinical trial. *Eur J Obstet Gynecol Reprod Biol* 2012;162:169–73.
- [21] Gullo G, Petousis S, Papatheodorou A, et al. Closed vs. open oocyte vitrification methods are equally effective for blastocyst embryo transfers: prospective study from a sibling oocyte donation program. *Gynecol Obstet* 2020;85:206–12.
 - [22] Papatheodorou A, Vanderzwalmen P, Panagiotidis Y, et al. How does closed system vitrification of human oocytes affect the clinical outcome? A prospective, observational, cohort, noninferiority trial in an oocyte donation program. *Fertil Steril* 2016;106:1348–55.
 - [23] Laganà AS, La Rosa VL, Rapisarda AMC, et al. Anxiety and depression in patients with endometriosis: impact and management challenges. *Int J Womens Health* 2017;9:323–30.
 - [24] Šprem Goldstajn M, Mikuš M, Ćorić M, et al. The pharmacoeconomic impact of follitropin alpha biosimilars in IVF therapy in Europe: a report of the literature. *Expert Rev Pharmacoecon Outcomes Res* 2021;21:553–8.
 - [25] Wang J, Sauer MV. In vitro fertilization (IVF): a review of 3 decades of clinical innovation and technological advancement. *Therapeut Clin Risk Manag* 2006;2:355–64.
 - [26] Lo Giudice JA, Massaro J. The impact of complementary therapies on psychosocial factors in women undergoing in vitro fertilization (IVF): a systematic literature review. *Appl Nurs Res* 2018;39:220–8.
 - [27] Maroufizadeh S, Ghaheeri A, Samani O. Factors associated with poor quality of life among Iranian infertile women undergoing IVF. *Psychol Health Med* 2017;22(2):145–51.
 - [28] Galst JP. The elusive connection between stress and infertility: a research review with clinical implications. *J Psychother Integrat* 2018;28(1):1–13.
 - [29] Montagnini HL, Kimati CT, Lorenzon AR, Bonetti TCS, Serafini PC, La Motta E, et al. Psycho-emotional acceptance in couple and single women who choose to undergo IVF treatment with donor eggs. *JBRA Assist Reprod* 2022;27(2):259–66.
 - [30] World Health Organization. Division of mental health and prevention of substance abuse. WHOQOL: measuring quality of life; 1997. Available from: <https://apps.who.int/iris/handle/10665/63482>.
 - [31] Gameiro S, Boivin J, Dancet E, De Klerk C, Emery M, Lewis-Jones C, et al. ESHRE guideline: routine psychosocial care in infertility and medically assisted reproduction - a guide for fertility staff. *Hum Reprod* 2015;30(11):2476–85.
 - [32] Sharma A, Shrivastava D. Psychological problems related to infertility. *Cureus* 2022;14(10):e30320.
 - [33] Chachamovich J, Chachamovich E, Fleck MP, Cordova FP, Knauth D, Passos E. Congruence of quality of life among infertile men and women: findings from a couple-based study. *Hum Reprod* 2009;24(9):2151–7.
 - [34] Fisher JR, Baker GH, Hammarberg K. Long-term health, wellbeing, life satisfaction, and attitudes toward parenthood in men diagnosed as infertile: challenges to gender stereotypes and implications for practice. *Fertil Steril* 2010;94(2):574–80.
 - [35] Greil AL. Infertility and psychological distress: a critical review of the literature. *Soc Sci Med* 1997;45:1679–704.
 - [36] Drosdzol A, Skrzypulec V. Quality of life and sexual functioning of Polish infertile couples. *Eur J Contracept Reprod Health Care* 2008;13:271–81.
 - [37] Fisher JRW, Hammarberg K. Psychological and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and future research. *Asian J Androl* 2012;14:121–9.
 - [38] Blake L, Jadva V, Golombok S. Parent psychological adjustment, donor conception and disclosure: a follow-up over 10 years. *Hum Reprod* 2014;29(11):2487–96.
 - [39] Hammer Burns L, Covington SN. Psychology of infertility. In: Covington SN, Burns LH, editors. *Infertility counselling. A comprehensive handbook for clinicians*. second ed. New York: Cambridge University; 2006.
 - [40] Hajela S, Prasad S, Kumaran A, Kumar Y. Stress and infertility: a review. *Int J Reprod Contracept Obstet Gynecol* 2016;5(4):940–3.
 - [41] Peterson BD, Sejbaek CS, Pirritano M, Schmidt L. Are severe depressive symptoms associated with infertility-related distress in individuals and their partners? *Hum Reprod* 2014;29:76–82.
 - [42] Chachamovich JR, Chachamovich E, Ezer H, Fleck MP, Knauth D, Passos EP. Investigating quality of life and health-related quality of life in infertility: a systematic review. *J Psychosom Obstet Gynaecol* 2010;31(2):101–11.
 - [43] Keramat A, Masoumi SZ, Mousavi SA, Poorolajal J, Shobeiri F, Hazavehie SMM. Quality of life and its related factors in infertile couples. *J Res Health Sci* 2014;14(1):57–64.
 - [44] Le Goff J, Reignier A, Mirallie S, Dubourdieu S, Barrière P, Fréour T, et al. Sexual function in heterosexual couples undergoing assisted reproductive technology (ART) cycles with donor sperm. *Arch Gynecol Obstet* 2023;307:625–32.
 - [45] Hershtberger PE, Gallo AM, Adlam K, Driessnack M, Grotevant HD, Klock SC, et al. Parents' experiences telling children conceived by gamete and embryo donation about their genetic origins. *Fertil Steril Rep* 2021;2:479–86.
 - [46] Sälevaara M, Punamäki RL, Unkila-Kallio L, Vänskä M, Tulppala M, Tiitinen A. The mental health of mothers and fathers during pregnancy and early parenthood after successful oocyte donation treatment: a nested case-control study. *Acta Obstet Gynecol Scand* 2018;97:1478–85.
 - [47] Stanhisser J, Steiner AZ. Psychosocial aspects of fertility and assisted reproductive technology. *Obstet Gynecol Clin* 2018;45:563–74.
 - [48] Tricco AC, Lillie E, Zarin W, O'Brien K, Colquhoun H, Kastner M, et al. Scoping review: what they are and how you can do them. Knowledge Translation Program, Li Ka Shing Knowledge Institute of St. Michael's Hospital; 2016. Available from: <https://training.cochrane.org/resource/scoping-reviews-what-they-are-and-how-you-can-do-them>.
 - [49] Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467–73. <https://doi.org/10.7326/M18-0850> [Epub 4 September 2018].
 - [50] Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8(1):19–32. <https://doi.org/10.1080/1364557032000119616>.
 - [51] Lisovskaya TV, Zakhezina EA, Filippova GG, Ambartsumyan EM, Portnov IG, Mayasina EN. Mental state assessment of recipients in the IVF donor programs and psychotherapeutic methods of its correction. *Gynecol Endocrinol* 2017;33(sup1):28–31.
 - [52] Madero S, Gameiro S, García D, Cirera D, Vassena R, Rodríguez A. Quality of life, anxiety and depression of German, Italian and French couples undergoing cross-border oocyte donation in Spain. *Hum Reprod* 2017;32(9):1862–70.
 - [53] Bagheri M, Jafarabadi M, Vasegh Rahimparvar SF, Nourbala AA, Behboodi Moghadam Z. Concerns of infertile women candidates for egg donation: a qualitative study. *J Family Reprod Health* 2020;14(1):21–31.
 - [54] Ghelich Khani S, Kazemi A, Fereidooni Moghadam M, Alavi M. Psycho-social experience of oocyte recipient women: a qualitative study. *BMC Women's Health* 2021;21:406.
 - [55] Le Goff J, Reignier A, Mirallie S, Dubourdieu S, Barrière P, Fréour T, et al. Sexual function in heterosexual couples undergoing assisted reproductive technology (ART) cycles with donor sperm. *Arch Gynecol Obstet* 2023;307:625–32.
 - [56] Visser M, Gerrits T, Kop F, Van der Veen F, Mochtar M. Exploring parents' feelings about counseling in donor sperm treatment. *J Psychosom Obstet Gynaecol* 2016;37(4):156–63.
 - [57] Aber C, Weiss M, Fawcett J. Adattamento delle donne contemporanee alla maternità: le prime 3-6 settimane dopo il parto. *Infermiere Sci Q* 2013;26:344–51.
 - [58] Klock SC, Greenfeeld DA. Parental knowledge of donors and their attitude towards disclosure in oocyte donation. *Reprod Biomed* 2004;19:1575–9.

- [59] Millheiser LS, Helmer AE, Quintero RB, Westphal LM, Milki AA, Lathi RB. Is infertility a risk factor for female sexual dysfunction? A case-control study. *Fertil Steril* 2010. <https://doi.org/10.1016/j.fertnstert.2010.01.037>.
- [60] Nelson CJ, Shindel AW, Naughton CK, Ohebshalom M, Mulhall JP. Prevalence and predictors of sexual problems, relationship stress, and depression in female partners of infertile couples. *J Sex Med* 2008. <https://doi.org/10.1111/j.1743-6109.2008.00880.x>.
- [61] Huyghe E, Bonal M, Daudin M, Droupy S. Sexual dysfunctions and infertility. *Prog Urol* 2013. <https://doi.org/10.1016/j.purol.2013.02.004>.
- [62] Yökölmaz TN, Öztürk E, Hamidi N, Selvi İ, Başar H, Peşkirioğlu L. Evaluation of sexual dysfunction prevalence in infertile men with non-obstructive azoospermia. *Arch Ital Urol Androl* 2020. <https://doi.org/10.4081/aiua.2019.4.241>.
- [63] Starc A, Trampuš M, Pavan Jukić D, Rotim C, Jukić T, Polona MA. Infertility and sexual dysfunctions: a systematic literature review. *Acta Clin Croat* 2019. <https://doi.org/10.20471/acc.2019.58.03.15>.
- [64] Aslan MM, Ugurel V, Elter K. The attitudes of fertile and infertile women to oocyte donation in a Muslim and secular population. *Pakistan J Med Sci* 2017;33(5):1260–4.