The Benefits of Expressive Writing in Group Psychological Counseling with ART Patients

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Abstract

This article investigates the benefits of expressive writing within an integrated model of group psychological counseling for patients undergoing Assisted Reproductive Technology (ART) treatments. The research questions focus on the effectiveness of the integrated model, which combines group counseling with expressive writing, in improving emotional regulation, psychological well-being, and quality of life in individuals facing infertility.

A quasi-experimental pre-post design was adopted with 11 participants undergoing ART treatment. Participants completed questionnaires assessing quality of life, emotion regulation, and depression levels before and after a group psychological counseling program integrating expressive writing exercises. Statistical analysis revealed significant improvements in emotional management and quality of life dimensions. No significant changes were found in perception of medical treatment or interpersonal relationships, suggesting the intervention may have greater impact on individual rather than relational dimensions.

Overall, the integrated model of group psychological counseling with expressive writing appears to be a valuable approach in psychological support

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for ART patients. Further research is necessary to explore its long-term effects and to develop more targeted interventions focusing on couple relationships and perception of medical treatment.

Keywords: Infertility, Assisted Reproductive Technology (ART), expressive writing, psychological support, couple relationship.

Introduction

Infertility represents one of the most complex and multidimensional challenges a couple may face in their life journey. Defined by the World Health Organization (WHO) as "a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse" (World Health Organization, 2018), this condition is not merely a biological issue. Instead, it deeply permeates individual identity, couple dynamics, and the psychosocial well-being of those involved.

Globally, infertility affects approximately 15-20% of couples of reproductive age, with estimates suggesting that 60-80 million couples worldwide are affected (Visigalli, 2011; Volpini & Melis, 2013). In Italy, according to data from the Ministry of Health (2015), around 30% of couples experience infertility, a rate consistent with other industrialized countries. This translates into approximately 100,000 couples per year facing reproductive difficulties, based on the number of annual marriages. Recent data from the Italian National Institute of Health (Istituto Superiore di Sanità, 2023) confirm the persistence of this issue, showing a steady increase in ART procedures, which reflects the growing demand for support among couples facing fertility problems.

The psychological impact of infertility has been widely documented in scientific literature: as noted by Cousineau and Domar (2007), the inability to conceive is perceived as a highly stressful situation by individuals and couples around the world. It triggers a cascade of emotional reactions, including shock, denial, anger, depression, anxiety, and social withdrawal (Visigalli, 2011). These emotional responses are not merely transient but may evolve into

dysfunctional patterns that significantly impair quality of life and overall psychological well-being.

The medical response to infertility is represented by Assisted Reproductive Technology (ART), a set of techniques designed to assist couples in achieving pregnancy when natural conception is not possible. These techniques have evolved significantly over recent decades, thanks to advances in medicine and biotechnology. ART procedures range from first-level interventions, such as intrauterine insemination (IUI), to more complex second- and third-level procedures, such as in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI). In Italy, ART practices are regulated by Law 40/2004, which, despite numerous modifications following Constitutional Court rulings, remains the central legislative reference for ART in the country.

The evolution of ART in Italy shows continuous growth. According to the Istituto Superiore di Sanità (2023), ART treatments nearly doubled from 63,585 in 2005 to 109,755 in 2022, with the percentage of live births from ART rising from 1.22% to 4.25% of the general population. These figures reflect not only the increasing effectiveness of ART techniques but also the growing demand for support from couples experiencing fertility problems.

However, the ART journey is far more than a series of medical procedures and success rates. As highlighted by Salerno and Merenda (2016), fertility treatments involve a significant emotional burden, often characterized by intense feelings of sadness, anger, shame, and isolation. The cyclical nature of the treatments, alternating between hope and disappointment, the invasiveness of the procedures, the financial and emotional costs, and the uncertainty of outcomes create a context of chronic stress that can severely challenge individual and relational psychological resources.

In this complex scenario, psychological support plays a crucial role. The guidelines of the Italian Ministry of Health (2024) explicitly acknowledge this need, stating: «Each ART center must provide couples with access to counseling and the possibility of psychological support for patients and couples who require it…». Psychological support is thus not an optional component but an integral part of the care pathway, to be made available throughout all phases of the diagnostic and therapeutic process for infertility.

Among the various forms of psychological support, group

interventions emerge as particularly effective. As noted by Piccinino (2019), group settings offer a unique opportunity for sharing with others undergoing similar experiences, reducing the sense of isolation and normalizing the emotional responses associated with infertility. Engaging with peers who truly understand the challenges of infertility and ART can provide substantial emotional support and foster shared coping strategies.

Within this clinical and theoretical framework, expressive writing is introduced as a promising therapeutic tool. Conceptualized and developed by James W. Pennebaker in the 1980s, expressive writing is based on the principle that writing about deep thoughts and emotions can facilitate the cognitive-emotional processing of difficult or traumatic experiences. In their pioneering 1986 study, Pennebaker and Beall showed that university students who wrote for 15–20 minutes per day over four consecutive days about a personal traumatic experience exhibited better physical and mental health in the following months compared to a control group who wrote about neutral topics (Lo Iacono, 2016).

The mechanisms through which expressive writing exerts its beneficial effects have been widely investigated. Pennebaker (1989; 1997) identified two primary mechanisms: emotional inhibition reduction and cognitive restructuring. The inhibition theory posits that suppressing thoughts and emotions related to traumatic experiences requires constant cognitive effort, leading to stress accumulation and related health issues. Expressive writing, by allowing emotional expression, reduces the cognitive and physiological burden associated with emotional suppression.

Cognitive restructuring, on the other hand, suggests that writing about emotionally intense events compels individuals to organize and make sense of the experience in a structured way. This process facilitates the integration of the event into one's life narrative, thereby reducing the cognitive and emotional fragmentation typical of traumatic or stressful experiences (Barros *et al.*, 2020; De Luca Picione, 2022; De Luca Picione & Valsiner, 2017; Frattaroli, 2006; Freda & Martino, 2015; Freda *et al.*, 2023; Salvatore *et al.*, 2022, 2024; Stenner & De Luca Picione, 2023).

The efficacy of expressive writing has been demonstrated in various clinical contexts, with reported benefits including improved

immune function, reduced medical visits, lower levels of depression and anxiety, and overall improvements in quality of life (Lepore, 1997; Pennebaker, 1997; Pennebaker & Beall, 1986; Pennebaker & Smith, 2017).

In the specific field of ART, research on the application of expressive writing remains relatively limited. Studies conducted in Italy by Renzi and colleagues (2013, 2014, 2017, 2021) have begun to systematically explore the potential of this technique in supporting patients undergoing ART. Findings have indicated improvements in emotional identification and regulation, better cognitive-emotional processing, and in some cases even increased pregnancy rates (Cleves-Valencia *et al.*, 2024; Renzi, 2016).

However, not all studies have yielded unequivocally positive results. For example, Panagopoulou *et al.* (2009) did not find significant differences in emotional distress between experimental and control groups and observed a higher pregnancy rate in the group that did not participate in expressive writing. Similarly, Frederiksen *et al.* (2017) reported a reduction in depressive symptoms but not in anxiety or infertility-related distress, concluding that the efficacy of expressive writing in the context of infertility requires further investigation.

These contrasting findings highlight the complexity of the phenomenon and the need for further research to explore not only whether expressive writing is effective, but also for whom, under what conditions, and through which specific mechanisms. It is particularly important to consider how this technique can be optimally integrated with other forms of psychological support, such as group psychological counseling, to maximize its therapeutic benefits.

The present study is situated within this research context and aims to contribute to the understanding of the effectiveness of expressive writing when integrated into a structured group psychological counseling program for ART patients. The adopted approach combines the benefits of individual expressive writing with those of group support, creating a multidimensional intervention designed to address the complex psychological needs of individuals undergoing assisted reproduction.

Aims

The primary objective of this study was to evaluate the effectiveness of expressive writing as a therapeutic intervention integrated into a group psychological counseling program for patients undergoing Assisted Reproductive Technology (ART) treatments. The research aimed to explore the potential of this combined approach in promoting emotional processing and reducing the psychophysical stress burden commonly associated with ART journey.

Specifically, the investigation aimed to verify the impact of the integrated intervention on three core dimensions: the reduction of depression levels, the improvement in emotional regulation, and the enhancement of perceived quality of life. An additional objective was to explore the potential positive effects of the intervention on couple dynamics, investigating whether the integration of individual processing through writing and group support could foster greater cohesion, communication, and mutual understanding throughout the ART process.

The central hypothesis of the study posited that the integrated intervention, combining expressive writing, which stimulates deep emotional and cognitive processing of the ART experience, with group psychological counseling, which provides emotional validation, normalization of experiences, and reduction of isolation, could significantly contribute to reducing psychophysical distress and enhancing emotional resilience. The study therefore aimed to provide empirical evidence of the usefulness of this intervention model within psychological support protocols for ART patients, contributing to the development of more effective and personalized therapeutic approaches.

Method

Study Design

This study employed a quasi-experimental design with pre- and post-intervention assessment without a control group. This methodological choice was informed by both practical and contextual considerations inherent to the clinical setting. The limited number of

participants and the characteristics of the convenience sample did not allow for the creation of a separate control group.

Although the pre-post design has inherent limitations, it allowed for the evaluation of changes in participants by comparing measurements taken before and after the intervention. This approach, commonly adopted in clinical research conducted in real-world settings, yields valuable insights into intervention effectiveness, although causal interpretations should be made with caution.

Setting and Context

The study was conducted at an Assisted Reproductive Technology center within a public healthcare facility in Northern Italy, recognized as a reference center at both local and national levels. The center, supported by a non-profit association founded by former patients, promotes an integrated approach to ART that values both the medical and psychological dimensions of care.

The decision to conduct the study in this particular setting was based on several factors: first, the established collaboration between the medical center and the association facilitated the implementation of the psychological intervention; second, the sensitivity of the head physician and the medical team to the psychological aspects of ART created a favorable environment for integrating psychological support into the treatment process. Finally, the ability to offer sessions both in-person and online enabled the inclusion of patients from various regions across Italy, increasing the sample's representativeness. All participants, however, opted for the online format, and the sessions were therefore conducted synchronously via remote connection, with all group members participating simultaneously.

The Intervention: "Storie di PMA" ("ART Stories") Program

The intervention, titled "*Storie di PMA*" ("ART Stories"), consisted of a group psychological counseling program integrating the technique of expressive writing, that lasted seven months, from November 2023 to May 2024. The structure included monthly group sessions of

approximately two hours each, for a total of seven meetings. The sessions were conducted by a psychologist. Healthcare professionals from the Assisted Reproductive Technology Center did not directly participate in the sessions, in order to ensure a psychological processing space distinct from the medical setting and to promote the free emotional expression of participants, including potential difficulties or ambivalences toward the treatment itself.

During the first session, participants were introduced to the group counseling program and the research project, with an explanation of expressive writing and a detailed presentation of the objectives, procedures and confidentiality rules. At this stage, the pre-intervention assessment instruments were administered, followed by the first writing exercise.

Each session followed a consistent structure consisting of three phases: an initial stage of welcoming and introduction of the theme, an individual writing phase, and a subsequent phase of group sharing and reflection. Participants spent approximately twenty minutes on expressive writing, following Pennebaker's protocol, which invites individuals to write continuously about their deepest thoughts and feelings related to the proposed topics, without concern for grammar, spelling, or structure (Pennebaker & Beall, 1986). Writing took place simultaneously, with cameras turned off to promote focus and privacy.

At the end of the writing phase, participants who wished to do so could share reflections, emotions, or excerpts from their texts with the group, in a non-judgmental environment aimed at emotional elaboration and the construction of shared meanings. This structure allowed for the integration of the benefits of expressive writing, facilitation of emotional processing, reduction of inhibition, and cognitive restructuring (Pennebaker, 1997), with those of group work, such as reduction of isolation, validation of experiences and vicarious learning (Piccinino, 2019).

The writing themes were selected to guide participants through a progressive emotional exploration process, moving from the narration of their experience and the emotions associated with infertility and ART, to relational dimensions and experiences of loss, and finally to a projection of the self into the future (see Table 1).

Table 1 – Writing themes

Session	*Theme*	*Objective*
1	The story of one's infertility	Narrative reconstruction of the experience
2	Emotions related to infertility/ART	Exploration of emotional experience
3	Letter to one's partner	Facilitation of couple communication
4	Free topic	Emergence of personally significant themes
5	Loss and grief	Processing of losses experienced in the context of infertility
6	Sharing and taboos	Exploration of the relationship with the social context
7	Letter from the future to oneself	Positive projection and closure

This sequence facilitated a progressive integration of the experience, fostering reflection and personal growth.

The seventh and final session concluded with a collective reflection, during which participants shared the insights gained and the resources developed to face future challenges, thereby strengthening mutual support beyond the structured sessions. At the end of the program, the post-intervention assessment instruments were administered again.

The decision to propose a progressive thematic pathway, instead of the original Pennebaker protocol, which invites participants to write about the most traumatic experience of their life, was motivated by specific clinical and methodological considerations related to the ART context. The experience of infertility does not constitute a single traumatic event, but rather a complex process involving identity, relational, bodily, and social dimensions (Molina *et al.*, 2025; Salvatore *et al.*, 2025). Structuring the intervention around themes, therefore, allowed for a gradual emotional exploration, facilitating access to emotions even for participants with no prior psychological support experience, and enhancing group cohesion through a shared focus.

Measures

The evaluation of the intervention's effectiveness was based on a multidimensional approach that integrated four primary instruments, selected for their ability to capture the various aspects of participants' psychological and relational well-being.

The Fertility Quality of Life Questionnaire (FertiQoL), in its Italian validated version by Volpini *et al.* (2020), was employed as a fertility-specific measure of quality of life.

The instrument consists of 36 items divided into two modules: Core and Treatment.

- The Core module includes 2 optional items assessing overall quality of life and physical health, and 24 items grouped into four subscales (Boivin *et al.*, 2011):
  - Emotional: explores the emotional impact of infertility.
  - Mind-Body: evaluates the influence of infertility on physical and mental well-being.
  - Relational: examines the impact of infertility on the couple's relationship and overall quality of life.
  - Social: assesses the impact of infertility on social and professional relationships.
- The Treatment module contains 10 items organized into two subscales:
  - Environment: evaluates satisfaction with the healthcare environment.
  - Tolerability: explores the physical and emotional tolerability of the treatment.

Each item is rated on a 5-point Likert scale, with standardized scores ranging from 0 to 100, where higher scores indicate better quality of life (Boivin, 2011).

The Difficulties in Emotion Regulation Scale-20 (DERS-20), in its Italian short version validated by Lausi *et al.* (2020), was used to assess emotion regulation difficulties across five dimensions:

1. Non-acceptance of negative emotional responses.
2. Difficulty controlling impulsive behaviors when emotionally activated.

3. Lack of emotional awareness.
4. Lack of emotional clarity.
5. Difficulty engaging in goal-directed behavior when emotionally activated.

The short version maintains sound psychometric properties compared to the original version and is particularly suitable for clinical research contexts (Lausi *et al.*, 2020).

The Teate Depression Inventory (TDI) was selected as the specific tool for assessing depressive symptoms due to its excellent psychometric properties within the Italian population and its sensitivity in detecting sub-threshold symptoms, which are especially relevant in the context of ART (Balsamo & Saggino, 2013). The TDI consists of 21 items based on the diagnostic criteria for Major Depressive Episode (DSM IV-TR and V), exploring affective, cognitive, physical, and behavioral symptoms through a 5-point Likert scale.

A specifically designed *sociodemographic questionnaire* completed the assessment battery, collecting information on age, sex, marital status, education level, occupation, duration of the relationship, length of time attempting to conceive, and previous requests for psychological support. These data allowed for a detailed characterization of the sample and the exploration of potential moderating variables related to intervention effectiveness.

Participants

Sample characteristics. The final study sample consisted of 11 participants (5 couples and one individual participant) recruited from the patient population at the ART center, who voluntarily enrolled in the group psychological counseling program. This was a convenience, non-randomized sample, with inclusion criteria based on being actively engaged in ART treatment and availability to participate in the full intervention cycle. The sample reflects the clinical reality of the service and the typical characteristics of the population accessing ART treatment in Italy.

Socio-demographic characteristics. Participants' ages (see Table 2) showed a considerable range, extending from 31 to 55 years, reflecting the phenomenon of delayed parenthood that characterizes contemporary society.

Table 2 – Age

Age	*Frequencies*	*% of Total*	*Cumulative %*
31-35	2	18.2%	18.2%
36–40	5	45.5%	63.6%
41–45	3	27.3%	90.9%
51–55	1	9.1%	100.0%

The highest concentration of participants fell within the 36–40 age range (45.5%), aligning with national data indicating that the average age of women accessing ART in Italy is approximately 37 years.

Gender distribution was relatively balanced, with 6 women (54.5%) and 5 men (45.5%), reflecting the presence of complete couples in the group. This gender balance represents a strength of the study, considering that much infertility research tends to focus predominantly on female populations.

Regarding marital status, the sample was nearly evenly split between married individuals (5 participants, 45.5%) and cohabiting partners (6 participants, 54.5%). Relationship duration (see Table 3) showed substantial stability, ranging from a minimum of 5 years to a maximum of 14 years.

Table 3 – Relationship/cohabitation duration

Duration (years)	*Frequencies*	*% of Total*	*Cumulative %*
5	3	27.3%	27.3%
6	2	18.2%	45.5%
7	2	18.2%	63.6%
12	2	18.2%	81.8%
14	2	18.2%	100.0%

None of the participants had children at the time of the study.

The educational level of the sample was medium to high, with 4 participants holding a university degree and 3 possessing postgraduate qualifications. The occupational profiles were diverse, with a predominance of employees and teachers.

A central variable for understanding the sample was the duration of the attempt to conceive (see Table 4), which varied considerably among participants. This variability reflects the prolonged stress and emotional burden experienced by couples prior to joining the group.

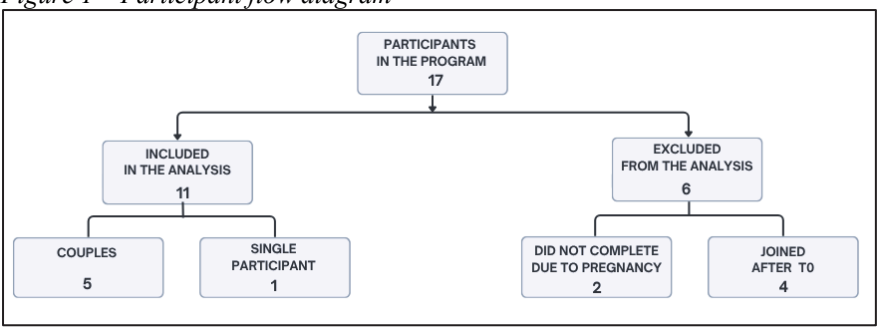
Table 4 – Conception attempt duration

Duration (years)	*Frequencies*	*% of Total*	*Cumulative %*
3	5	45.5%	45.5%
6	2	18.2%	63.6%
2	2	18.2%	81.8%
5	2	18.2%	100.0%

Particularly noteworthy was the data regarding prior access to psychological support: only 3 out of 11 participants had previously sought psychological help for infertility-related difficulties. These help-seeking episodes occurred at different stages: one participant began psychological treatment after learning she would need to undergo heterologous fertilization and was still receiving support at the time of the study; another initiated counseling at the beginning of the ART process; and a third participant requested a psychological evaluation approximately four months before the initial questionnaire was administered.

Despite its small size, the sample presents characteristics that make it reasonably representative of the population accessing ART services in Italy: advanced maternal age, high educational attainment, stable relationships, and prolonged histories of infertility.

Figure 1 – Participant flow diagram



The presence of five complete couples in the sample represents a particularly interesting aspect of the study. Both partners in these couples actively participated in all sessions, sharing the same group space while producing independent individual writings. This configuration made it possible to observe, albeit within the limits of the quantitative analysis conducted, how the intervention could influence both the individual well-being of each partner and, potentially, the couple's dynamic through the sharing of a common elaborative experience. The single participant was a woman whose partner was unable to take part in the group.

It is important to note that the number of participants would have been higher, but not all individuals completed the full intervention. Some participants left the program due to a successful pregnancy, while others joined the group after the initial round of assessment had already taken place (see Figure 1).

Reasons for exclusion:

- Pregnancy achieved: two participants, a couple, achieved a pregnancy during the program and chose to discontinue their participation in the group. Although this represents a positive outcome, it prevented the completion of the full pre–post assessment.
- Late entry: four participants joined the group after the initial test administration (T0) had already taken place, making pre–post comparison impossible. These participants nevertheless benefited from the intervention but were not included in the quantitative analysis.

It is important to note that there were no actual dropouts due to dissatisfaction or difficulties related to the intervention, indicating good overall acceptability of the proposed program.

The management of these moments required careful clinical attention. This dynamic, typical of open groups in clinical settings, introduced certain limitations in pre-and post-data collection for the entire sample, which is why those cases were excluded from the study.

Qualitative characteristics of the sample. In addition to quantitative data, several qualitative observations help complete the description of the sample:

1. Motivation to participate: participants generally exhibited high motivation, as evidenced by regular attendance.

2. Emotional openness: emotional openness varied initially, with some participants more reserved. However, this openness generally increased over the course of the group sessions.
3. Engagement with writing: adherence to the expressive writing task was generally positive, with most participants demonstrating good willingness and engagement in the activity. One participant, however, experienced greater difficulty approaching the writing exercises and required additional encouragement and extended time to complete the proposed tasks, although they remained engaged in the group process.
4. Personal resources: overall, participants demonstrated good personal resources in terms of reflective capacity, social support (beyond the partner), and coping strategies, despite some individual variability.

Ethical approval for the study was obtained from the hospital's Medical Director, the Head Physician and the non-profit association. All procedures performed in the study were in accordance with institutional ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Participants were informed about the general aim of the research, the anonymity of responses, and the voluntary nature of participation, and they signed an informed consent form. No incentive was given.

Data analysis

The effectiveness of the intervention was assessed through the analysis of pre-and post-treatment score variations on the administered scales. For the FertiQoL, in addition to the total score, three specific subscales were analyzed separately: the Core scale (assessing emotional and social aspects central to quality of life), the Treatment scale (measuring satisfaction with medical treatment), and the Relational scale (examining the impact of infertility on interpersonal relationships). For the DERS-20 and TDI, total scores were analyzed.

Given the nature of the sample and the measures used, statistical analysis was conducted using the Wilcoxon signed-rank test for paired samples, implemented in the Jamovi software. The choice of this non-parametric test was based on several methodological considerations:

1. Sample size: with a small final sample, parametric tests such as the paired-samples t-test would have yielded less reliable estimates. The Wilcoxon test retains robust statistical properties even with small samples, without compromising result validity (Blair & Higgins, 1985).
2. Distributional assumptions: the limited sample size could have led to violations of the normality assumption required for parametric tests. The Wilcoxon test, which does not require assumptions about distributional shape, was therefore more appropriate (Chiorri, 2010).
3. Nature of the data: the psychometric scales used produce ordinal or interval-level data, for which the Wilcoxon test is particularly suitable, as it is based on ranks rather than absolute values (Pappas & DePuy, 2004; Chiorri, 2010).
4. Repeated-measures design: since the same participants were assessed pre-and post-intervention, a test accounting for the dependency between observations (paired samples) was required. The Wilcoxon test is ideal in this context, as it evaluates within-subject differences (Blair & Higgins, 1985; Pappas & DePuy, 2004).

Results

Data analysis revealed differentiated patterns of intervention effectiveness across the evaluated dimensions.

Fertility-related quality of life (FertiQoL)

The analysis of quality of life through the FertiQoL showed varied results across the different subscales, highlighting areas of significant improvement alongside domains that did not exhibit substantial changes.

The Core subscale (see Table 5) showed a statistically significant improvement ($p = 0.009$, well below the 0.05 threshold), with a large effect size ($r = 0.818$) indicating a substantial increase in participants' emotional and social well-being.

Table 5 – Wilcoxon Signed-Rank Test for Paired Samples–FertiQoL-Core

			Statistics	p		*Effect size (r absolute value)*
SUM_Q_pre	SUM_Q_post	Wilcoxon W	6.00	0.009	Rank-biserial correlation	0.818

Note. SUM_Q_pre = FertiQoL-Core sum scale pre-intervention. SUM_Q_post = FertiQoL-Core sum scale post-intervention.

The Treatment subscale, which measures satisfaction with medical treatment, showed no significant difference (see Table 6): the *p*-value was 0.837, well above the 0.05 threshold, with a medium effect size ($r = 0.318$). This suggests that the perception of medical treatment remained essentially stable, without clinically relevant changes.

Table 6 – Wilcoxon Signed-Rank Test for Paired Samples – FertiQoL-Treatment

			Statistics	p		*Effect size (r absolute value)*
SUM_T_pre	SUM_T_post	Wilcoxon W	43.5	0.837	Rank-biserial correlation	0.318

Note. SUM_T_pre = FertiQoL-Treatment sum scale pre-intervention. SUM_T_post = FertiQoL-Treatment sum scale post-intervention.

Similarly, the Relational subscale (see Table 7), assessing the impact of infertility on interpersonal relationships, showed no significant change ($p = 0.141$). The *p*-value of 0.141, also exceeding the 0.05 threshold, suggests that the intervention had no meaningful effect on this dimension. However, the medium effect size ($r = 0.422$) suggests a trend toward improvement in couple relationship quality, although not sufficiently pronounced to reach statistical significance.

Table 7 – Wilcoxon Signed-Rank Test for Paired Samples – FertiQoL-Relational

			Statistics	p		*Effect size (r absolute value)*
SUM_rel_pre	SUM_rel_post	Wilcoxon W	13.0	0.141	Rank-biserial correlation	0.422

Note. SUM_rel_pre = FertiQoL-Relational sum scale pre-intervention. SUM_rel_post = FertiQoL-Relational sum scale post-intervention.

Finally, the FertiQoL total score (see Table 8) showed a statistically significant improvement (p = 0.046), with a large effect size (r = 0.591), indicating an overall positive effect of the intervention on quality of life.

Table 8 – Wilcoxon Signed-Rank Test for Paired Samples – FertiQoL -Total

			Statistics	p		*Effect size (r absolute value)*
SUM_Qol_tot_pre	SUM_Qol_tot_post	Wilcoxon W	13.5	0.046	Rank-biserial correlation	0.591

Note. SUM_Qol_tot_pre = FertiQoL-Total sum scale pre-intervention. SUM_Qol_tot_post = FertiQoL-Total sum scale post-intervention.

Emotional regulation (DERS-20)

The assessment of emotion regulation through the DERS-20 (see Table 9) showed a significant improvement (p = 0.041), with a large effect size (r = 0.636). This result highlights a substantial enhancement in the participants' emotion regulation abilities, in line with the objectives of the integrated intervention program.

Table 9 – Wilcoxon Signed-Rank Test for Paired Samples – DERS-20

			Statistics	p		*Effect size (r absolute value)*
SUM_DERS-20_tot_pre	SUM_DERS-20_tot_post	Wilcoxon W	45.0	0.041	Rank-biserial correlation	0.636

Note. SUM_DERS-20_tot_pre = DERS-20 sum scale pre-intervention. SUM_DERS-20_tot_post = DERS-20 sum scale post-intervention.

Depressive symptoms (TDI)

Regarding depressive symptoms assessed with the TDI (see Table 10), the results showed a trend toward improvement that approached statistical significance (p = 0.055), with a large effect size (r = 0.561). This finding suggests a tendency toward a reduction in perceived depressive mood at the end of the program.

Table 10 – Wilcoxon Signed-Rank Test for Paired Samples – TDI

			Statistics	p		*Effect size (r absolute value)*
SUM_TDI_tot_pre	SUM_TDI_tot_post	Wilcoxon W	51.5	0.055	Rank-bi-serial correlation	0.561

Note. SUM_TDI_tot_pre = TDI sum scale pre-intervention. SUM_TDI_tot post = TDI sum scale post-intervention.

In addition to statistical significance, the effect size was calculated for each analysis using Rosenthal's *r*, which is appropriate for the Wilcoxon test. According to Cohen's (1988) conventions, *r* values of 0.10 indicate a small effect, 0.30 a medium effect, and 0.50 a large effect. This measure allows for the evaluation not only of whether a statistically significant difference occurred, but also of the practical and clinical relevance of the observed change (Chiorri, 2010).

Discussion

The findings from this study offer important insights into the effectiveness of an integrated group counseling intervention combined with expressive writing within the specific context of ART. The significant improvements observed in core quality of life and emotion regulation confirm the therapeutic potential of this approach, in line with previous studies employing expressive writing in different modalities (Frederiksen *et al.*, 2017; Renzi *et al.*, 2013). The present study extends this evidence by demonstrating that the integration of expressive writing into group psychological counseling can produce substantial benefits across these domains.

However, it is important to note that the study design does not allow for a clear distinction between the specific contributions of expressive writing and those of group support, and that the observed outcomes could be attributed to the synergistic effect of both components of the intervention. Both components, individual expressive writing and group psychological counseling, operate through complementary mechanisms. On the one hand, expressive writing allows patients to externalize their emotions and concerns related to fertility, which are

often intense and difficult to verbalize. This can reduce anxiety and stress associated with fertility problems, thereby improving perceived quality of life (Renzi & Solano, 2015; Renzi *et al.*, 2013; Renzi *et al.*, 2014; Renzi *et al.*, 2017; Renzi *et al.*, 2021). On the other hand, the group setting may further enhance emotional support among participants, reducing feelings of isolation and reinforcing the therapeutic effect (Piccinino, 2019). In the context of ART, where emotions are often intense and conflicted, the opportunity to express them in written form offers a safe space for exploring and integrating difficult experiences.

The improvement in emotional regulation is particularly relevant, considering that ART treatments demand a significant capacity to manage stress and emotional fluctuations linked to cycles of hope and disappointment. This result may have important practical implications for the ART journey: improved emotional regulation may foster greater adherence to treatment and more effective communication with the medical team. Regarding couple conflict and medical outcomes, the data from the present study do not allow for firm conclusions, as the relational dimension did not show significant changes and no information was collected on treatment results. However, existing literature suggests that psychological interventions effective in reducing stress may also have a potentially positive influence on reproductive outcomes (Frederiksen *et al.*, 2017), an aspect that warrants further investigation in future studies.

The absence of significant effects on the perception of medical treatment may be interpreted considering the complexity of factors influencing this dimension. The relationship with the medical team, past experiences of therapeutic failure, and individual expectations are deeply rooted elements that are unlikely to be modified by a short-term psychological intervention. Previous research has shown that couples who have experienced treatment failures, as in the present sample, report increasing concerns about treatment timelines (Martinelli & La Sala, 2009). Moreover, success in fertility treatment is not limited to technical outcomes but also depends on clinicians' ability to recognize and address patients' emotional and psychological needs. The quality of the doctor-patient relationship affects both treatment outcomes and patients' overall well-being (Kelley *et al.*, 2014). Repeated failures, if not managed relationally, can lead patients to

develop critical attitudes toward clinics and adjust their expectations about future treatments (Dancet *et al.*, 2010; Klitzman, 2018).

This result suggests the need for more targeted approaches, possibly integrated with interventions aimed at improving doctor-patient communication.

Similarly, the lack of significant improvement in the relational dimension calls for further reflection: couple dynamics in the context of infertility are profoundly complex, involving deep identity issues, dynamics of guilt and responsibility, and the renegotiation of roles and shared life plans that have developed over time. As noted by Riccio (2017), infertility challenges the couple's "dyadic membrane", requiring adaptive processes that may need more specific and extended interventions. Infertility and its treatment can trigger relational difficulties as couples adjust to a highly stressful condition (Peterson *et al.*, 2003). The established balance between partners may be disrupted, leading to dissatisfaction, anxiety, and sexual problems (Riccio, 2017). While expressive writing and psychological counseling may support individual emotional processing, they may not have an immediate or direct impact on couple dynamics. Relationship changes often require more targeted and prolonged interventions, such as couples therapy.

The trend toward improvement in depressive symptoms, although not statistically significant, warrants attention. Depression in the context of ART is often characterized by subthreshold manifestations that can still significantly affect quality of life. The fact that the intervention showed a positive, albeit limited, effect suggests that expressive writing, when integrated into a psychological counseling program, may contribute to preventing symptom worsening, acting as a protective factor.

A crucial aspect that emerged from the study concerns the importance of the group context. The sharing of writings and experiences created a space of emotional resonance where participants could feel understood and less alone in their journey.

Limitations and future directions

Despite the promising results, this study presents several limitations that reduce the generalizability and robustness of the findings and must be considered when interpreting the results, and that, at the same time, suggest directions for future research.

First, the absence of a control group represents a significant limitation, as it prevents the attribution of the observed changes solely to the proposed intervention rather than to external factors such as the mere passage of time, placebo effects, or concurrent life events (Chiorri, 2010). This methodological choice was primarily driven by practical and contextual constraints inherent to the clinical setting, including the limited number of participants, which did not allow for the creation of a separate control group. Closely related to this limitation is the inability to distinguish the specific contributions of expressive writing from those of group counseling. The lack of a control group that participated only in group counseling without expressive writing, or vice versa, limits the ability to attribute the observed changes exclusively to one of the two components. Future studies could adopt more robust research designs, such as implementing wait-list control groups or factorial designs comparing individual expressive writing, group counseling alone, the combined intervention, and a control group. Such approaches would allow for the assessment of both the main effects of each component and their possible interaction effects, while still ensuring that all patients have access to the intervention.

Second, the small sample size limits the statistical power of the analysis, increasing the likelihood of not detecting significant differences in some of the scales used, such as the TDI and certain FertiQol subscales. A larger sample could yield more robust results and offer greater sensitivity in detecting even subtle effects (Chiorri, 2010; Renzi *et al.*, 2021). Additionally, the sample was not selected using a systematic sampling method, which may impact the generalizability of the results and also introduces potential selection biases. It is possible that these patients exhibited specific characteristics, such as greater psychological openness, enhanced reflective capacities, and higher motivation for change, that distinguish them from the general ART population, potentially limiting the generalizability of the findings to less motivated patients or those with greater difficulties in emotional

processing. However, the analysis still provides valuable insights into the experiences of ART patients, particularly when integrated with socio-demographic and infertility history data.

Furthermore, the heterogeneity of the sample with respect to the stage of treatment (from first attempts to multiple failures) introduces variability that may obscure differential effects and future studies could benefit from more stringent inclusion criteria or stratified analyses. A potential direction for future research would be to investigate whether the intervention produces different effects in patients who have just begun ART and those who have been undergoing treatment for several years, particularly in the context of repeated failures. Such an analysis would allow exploration of how the duration of treatment and experiences of failure may influence psychological well-being, emotion regulation, and quality of life. Patients undergoing treatment over a longer period may exhibit higher levels of stress, anxiety, and frustration compared to those in the initial phases, which may require specific and targeted psychological interventions.

Additionally, psychological measures could be used to monitor long-term emotional adjustment and potential differences in coping between patients with recent versus long-term ART experiences. This distinction could help in developing more personalized interventions, with support programs tailored according to the stage of treatment and patients' lived experiences.

Another possible limitation of this research concerns the self-reported nature of the measures, based on questionnaires such as the FertiQol, DERS-20, and TDI, may introduce subjective and social desirability bias, as participants' responses could be influenced by emotional states or the desire to present themselves in a favorable light (Chiorri, 2010).

The wide interval between writing sessions, one month, represents a significant deviation from Pennebaker's original protocol, which involves daily or closely spaced sessions. Although this choice was guided by practical and clinical considerations, allowing for group processing and integration of contents between sessions, it is possible that shorter intervals might have produced more pronounced effects. According to Pennebaker (1997; Pennebaker & Smyth, 2017), participants benefit more from multiple writing sessions spaced a few days apart rather than a single session. Pennebaker hypothesized that

repeated writing allows for deeper emotional processing, giving the brain time to assimilate thoughts and better cope with accumulated emotional stress. While this hypothesis is intriguing, the literature supporting it is still limited, and further studies are needed to confirm whether repeated and spaced sessions produce significantly better outcomes than a single session.

Even the lack of a formal qualitative analysis of the written texts represents a missed opportunity; a thematic analysis of the writings could reveal mechanisms of change not captured by quantitative measures. Methods such as thematic analysis (Braun & Clarke, 2006) or computerized linguistic analysis could effectively complement quantitative data in future studies.

In terms of future perspectives, another area that could be further explored concerns the FertiQol subscales that did not show significant improvement, such as the Treatment and Relational scales. Future interventions could investigate whether the effectiveness of the intervention might be enhanced by combining it with additional tools that specifically address patients' perceptions of medical treatments and their impact on interpersonal relationships.

Further research could explore the social dimensions of couples undergoing ART, examining whether their relationships serve as a resource or not. This could be investigated using the Social subscale of the FertiQol or other appropriate tools to assess social support and the impact of interpersonal relationships in the context of ART. Research by Martins and colleagues (2011), for instance, examined the relationship between family support, coping, and infertility-related stress, showing that perceived family support can significantly affect how women experience infertility-related stress, both directly and indirectly.

Despite these limitations, the study provides important preliminary evidence on the usefulness of combined intervention of expressive writing and group psychological counseling in psychological support to ART patients, opening several avenues for future research aimed at optimizing this therapeutic approach and identifying the conditions under which it proves most effective.

Conclusion

Significant improvements in quality of life and emotional regulation, along with a positive trend in the reduction of depressive symptoms, suggest that this approach could be a valuable addition to psychological support interventions in this context. And the results suggest several implications for clinical practice in the psychological support of ART patients.

The proposed intervention can be regarded as a low-cost and highly applicable model that could be integrated into standard psychological support protocols within ART centers. Its structure allows for relatively easy implementation even in settings with limited resources: it does not require specific equipment or highly specialized environments, and it can be conducted both in person and online, thereby increasing geographical accessibility.

The results also suggest that this intervention may be effective both for patients who have already undergone several treatment cycles and need to process their accumulated experiences, and for those at the beginning of the ART journey, with a function that is more preventive than elaborative, even though they may already have a history of infertility.

From a clinical perspective, while maintaining a standardized framework, the intervention can be tailored to the specific needs of the participants. Since not all individuals respond equally to this type of intervention, it is important to develop personalized strategies that consider factors such as baseline levels of emotional regulation, personal infertility history and the type of psychological support needed. Expressive writing can be adapted by increasing the number of sessions, which may be conducted either with therapeutic guidance or independently at home.

Furthermore, the group intervention does not replace but rather complements other forms of psychological support. It can be combined with individual therapy, precede or follow couple interventions, facilitating not only individual emotional processing but also fostering group cohesion. This contributes to enhancing the sense of belonging and shared experience (De Luca Picione *et al.* 2025), factors that may further improve patients' quality of life.

The clinical implications of this research also extend beyond direct patient intervention, highlighting the need for specific training for healthcare professionals. Effective implementation requires that

psychologists working in ART settings develop specialized competencies, including an in-depth understanding of Pennebaker's expressive writing protocol and its empirical evidence, skills in conducting psychological groups, with particular attention to managing intense emotions and facilitating sharing within a climate of trust, knowledge of the medical, psychological, and relational aspects of infertility and ART, and sensitivity in identifying situations that require referral to more intensive levels of care.

The systematic integration of this intervention within ART centers requires certain organizational conditions: the availability of suitable spaces for group meetings ensuring privacy and confidentiality; inclusion of the group psychological support offer in the informational materials provided to couples entering ART programs and flexibility in scheduling sessions to encourage participation (e.g., evening or weekend options). Collaboration with associations of former patients, as in the present study, may further facilitate implementation by providing logistical support, contributing to the dissemination of information, and bridging the medical and experiential dimensions of infertility.

The intervention proved particularly effective in facilitating individual emotional processing and enhancing overall psychological well-being, while showing less impact on relational dynamics and perceptions of medical treatment. These differentiated outcomes highlight the importance of integrated approaches that combine various types of interventions to address the complexity of ART patients' psychological needs.

The significance of the group context emerging from this study underscores how the combination of individual processing through writing and group sharing can create particularly effective therapeutic synergies. This intervention model offers patients both the introspective space necessary for personal elaboration and the social support essential for reducing the isolation that often accompanies infertility.

Despite methodological limitations, this study makes a meaningful contribution to the limited literature on expressive writing in the context of ART, particularly within the Italian setting. The findings encourage further research with more robust designs and larger samples but already suggest that this integrated intervention model deserves consideration as a complementary option in the psychological support of patients facing the challenges of assisted reproduction.

The future challenge will be to refine and optimize this approach, integrating it ever more effectively with other evidence-based interventions to offer ART patients psychological support that is not only scientifically grounded but also deeply respectful of the complexity and uniqueness of their experience.

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