Title: Experiential avoidance, self-compassion, self-judgment and coping styles in infertility

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Highlights

- Infertile couples show higher scores of experiential avoidance and self-judgment.

- Infertile women show higher maladaptive emotion regulation than their male partners.

- Couples applying for adoption show higher scores of self-compassion.

- Psychological interventions for infertile couples should target emotion regulation processes.

- Contextual cognitive-behavioral therapies may be adequate for infertile patients.

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Abstract

Objectives: This study sought out to explore the existence of differences regarding emotion regulation processes (psychological inflexibility/experiential avoidance, self-judgment and self-compassion) and coping styles (emotional/detached, avoidant and rational) in three different groups of couples: 120 fertile couples (FG), 147 couples with an infertility diagnosis who were pursuing medical treatment for their fertility problem(s) (IG), and 59 couples with infertility applying for adoption (AG).

Study design: Cross-sectional survey, using the couple as unit of analysis.

Main outcome measures: Participants filled in paper-pencil questionnaires assessing coping styles, psychological inflexibility/experiential avoidance, self-judgment and self-compassion.

Results: IG couples, and particularly women, tend to use more experiential avoidance and self-judgment mechanisms and less emotional/detached coping style. When compared to FG couples, IG and AG couples tend to apply more avoidant coping strategies. AG couples showed higher self-compassion.

Conclusions: Findings suggest that emotion regulation processes may be an important target in psychological interventions for patients dealing with infertility and with the demands of medical treatment.

Keywords: Infertility, psychological inflexibility/experiential avoidance, self-compassion, self-judgment, coping styles

Introduction

The European Society for Human Reproduction and Embryology (ESHRE) describes infertility as "a disease of the reproductive system defined by the failure to conceive after 12 months of regular unprotected sexual intercourse" (1, p. 1062). Besides being a disease of the reproductive system it is also a social and emotional condition and can be described as a low-control stressor in which the couple is confronted with the unfulfilled goal/desire of parenthood (2).

Concerning prevalence a systematic analysis of 277 health surveys estimates that 48.5 million couples worldwide are infertile (3). In Portugal, the Afrodite Study (4) found prevalence values between 9% and 10%.

Facing infertility is often seen as a physically and psychologically demanding experience and according to Covington and Adamson (5) feelings of defectiveness, inadequacy, inferiority, worthlessness, shame and guilt are frequently experienced by men and women with infertility. The relationship between infertility and psychopathology has gathered the interest of researchers but studies have produced mixed results. Reviews by Greil (2) and Eugster & Vingerhoets (6), highlighted more similarities than differences between infertile patients and comparison groups. Verhaak and colleagues (7), in a systematic review, described only slight differences regarding

emotions when comparing women starting *In Vitro* Fertilization (IVF) with controls. More recently, Biringer and colleagues (8) found no significant differences between women with current infertility and mothers without infertility regarding levels of anxiety and depression. On the other hand, Chen, Chang, Tsai and Juang (9) stated that women pursuing medical treatment for infertility show a high prevalence of psychiatric disorders, namely generalized anxiety disorder (23.2%) and major depression (17.0%). On a study conducted by Volgsten and colleagues 30.8% of women and 10.2% of men undergoing *In Vitro* Fertilization (IVF) treatment presented a psychiatric diagnosis. Major depression was the most common mood disorder (10.9% of women and 5.1% of men). Additionally, Sejbaek and colleagues (10) in a register-based national cohort study found that women presenting a diagnosis of depression prior to Assisted Reproduction Technologies (ART) treatment started considerably fewer treatment cycles and had a lower mean number of ART live births when compared with women without a depression history. Furthermore, in a prospective study on the reasons for treatment dropout, couples state that the stress infertility exerts on their relationship and being too anxious or too depressed to continue are the two more important ones (11). This finding was also corroborated by a systematic review that specified psychological burden as a common reason across treatment stages for couples discontinuing treatment (12).

In fact, dealing with difficulties in conceiving and the demands of medical treatment often leads to a painful emotional experience and emotion regulation processes may play a crucial role.

Emotion regulation can be defined as a set of processes by which we assess, monitor and express emotions according to the context of their occurrence (13, 14). Emotion regulation comprises

three core features: the activation of a regulatory goal (what people are trying to achieve), the engagement of regulatory processes (emotion regulation strategies to attain that goal) and the modulation of the emotion trajectory (consequences from using that strategy to achieve that emotion regulation goal) (15). Furthermore it can include the capacity to respond adequately to others' emotions (16). The relationship between psychopathological symptoms and the use of different emotion regulation strategies has been established in several studies (17).

Coping has been defined as the "cognitive and behavioral efforts to manage demands that are appraised as taxing or exceeding the resources of the person" (18 p. 141).

There are several classifications for coping strategies, usually as having rational and emotional components (19). However some of them do not include the detached or distancing coping style. Roger and colleagues (1993) states that the detached coping style can be a different from task-oriented strategies and it does not involve avoidance or denial. Instead feeling less involved with stressful events may help subjects to deal in a more effective way with stressful situations. As such in the current study we followed Roger's perspective and considered the following coping styles: emotional (feeling of being worthless, unimportant and overwhelmed by emotion), detached (feeling of being independent from the event and the emotion associated with it), rational (task oriented) and avoidant (physical and psychological avoidance). Although emotion regulation and coping may be difficult to distinguish and may somehow overlap, coping tends to focus on relieving stress responses (e.g., coping with infertility treatment over months) (20). According to John and Gross (21) an important distinction between coping and emotion regulation is that coping involves additional reappraisal of the problem and problem solving

intended to modify a situation or a behavioral response rather than just the emotional response s. As such coping includes more than regulating emotions. Furthermore coping is related to the way people deal with negative emotions elicited by stressful situations, while emotion regulation includes dealing with both positive and negative emotions (22).

More recently, constructs such as psychological inflexibility/experiential avoidance, self-compassion, self-judgment and have been pointed as important emotion regulation processes due to their impact in well-being and psychological adjustment (23, 24). These concepts emerge from contextual behavior therapies or 3rd wave cognitive-behavioral therapies and have been applied to a wide range of situations, such as chronic pain, cancer, anxiety disorders, depression and stress (25, 26). Evidence from these studies suggests that these processes may significantly reduce the suffering associated with several health conditions.

Psychological inflexibility/experiential avoidance can be defined as a process that occurs when people are unwilling to remain in contact with aversive inner experience. Machell, Goodman and Kashdan (27) define experiential avoidance as a regulatory strategy characterized by efforts to control or avoid unpleasant thoughts, feelings and bodily sensations. In fact, several studies have found an association between psychological inflexibility/experiential avoidance and several health conditions (e.g., 23, 26)

Self-compassion entails kindness and understanding towards oneself and others, perceiving one's experiences as part of the larger human experience, and being in contact with one's painful thoughts and emotions without over-identifying with them - three basic components (24). Self-

compassion can be seen as a useful emotion regulation process that encompasses a positive and supportive attitude towards the self, as it is associated with greater psychological health (28). Recently, Raque-Bogdan and Hoffman (29) found that self-compassion mediates the relation between the need for parenthood and subjective well-being in women with primary ("When a woman is unable to ever bear a child, either due to the inability to become pregnant or the inability to carry a pregnancy to a live birth") (30) or secondary infertility ("When a woman is unable to bear a child, either due to the inability to become pregnant or the inability to carry a pregnancy to a live birth following either a previous pregnancy or a previous ability to carry a pregnancy to a live birth") (30). These authors suggest that self-compassion may function as an emotional regulation strategy and a form of resiliency to deal with feelings of self-blame or blame for infertility.

On the other hand, self-judgment involves being harshly self-critical when in front of failure or pain (self-criticism), perceiving one's experiences as separate from the larger human experience (isolation) and over-identifying with painful thoughts and feelings (over-identification) (31). Self-judgment can be seen as an emotion regulation process in which individuals tend to be self-critical, to feel isolated and disconnected from others, and to over-identify with their negative emotional states (24).

Until recently, coping styles were the emotion regulation mechanisms that interested researchers the most in the area of infertility. Peterson and colleagues (32) have identified distancing/avoidant and responsibility acceptance as the coping styles positively correlated with

depression, while social support seeking and problem-solving strategies proved to be negatively correlated with depressive symptoms. A longitudinal study addressing coping styles in couples with 5 years of unsuccessful medical treatment for infertility showed that passive or active avoidant coping strategies were associated with personal, marital and social stress. In turn, meaning based coping strategies (being able to attach a positive meaning to the infertility experience) were related to a decrease in individual stress in women and to a decrease in marital stress in men (33). Another study revealed that coping processes beneficial to one spouse could be problematic for the other one. Specifically, couples where men rely predominantly on distancing coping style, but their partners use low amounts of distancing, showed higher levels of distress (34).

Regarding emotion regulation mechanisms and specifically in people with reproductive issues, a study conducted by Dana and colleagues (35) revealed that women facing infertility showed a reduction of emotion regulation functionality (more feelings suppression, more anger and less cognitive reassessment) and a decrease in affective control (more depressed mood, more anxiety and less positive affect) when compared to fertile controls. Additionally, the relevance of processes such as self-judgment, self-compassion and acceptance has already been suggested. For example, Galhardo and colleagues (36) found that depression was significantly associated with self-judgment in people with infertility. In line with these findings, another study addressing the mediator role of self-compassion and self-judgment on the effects of shame on infertility-related stress found significant gender differences. While in women self-compassion seemed to have a protective effect on the impact of internal shame, in men self-judgment emerged as a risk

factor increasing the impact of externally and internally focused shame on infertility-related stress (37).

Bearing in mind the importance of these constructs it is not surprisingly that researchers have been interested in understanding which coping strategies and processes are most effective under several circumstances. Gross (20) reviewed numerous studies and stated that emotion regulation is currently a major topic throughout psychology in biological, developmental, social, personality, clinical and health areas.Thus recognizing emotion regulation mechanisms that allow a more adaptive way of dealing effectively with stressful life situations, such as infertility (a low-control stressor) and identifying individual differences in the way people cope with negative events, namely infertility, are important research topics.

In light of the above, the current study intended to contribute to the broadening of this knowledge by addressing emotion regulation processes such as psychological inflexibility/experiential avoidance, self-compassion and self-judgment along with emotional/detached, rational and avoidant coping styles in three different groups of couples. Furthermore the use of a dyadic design that includes data from both male and female partners while controlling for the non-independence of couples' scores has been applied in studies in the infertility area e proved to be an important contribution (38, 39).

Considering that infertility has been described as an experience that induces stress, in the individual as well as in the couple (5), the aim was to explore differences in emotion regulation

processes between couples pursuing infertility medical treatment, fertile couples, and couples who were applying for adoption, using the couple as unit of analysis.

Methods

Participants

The study was conducted in a sample of 326 couples split into three groups, according to the following inclusion criteria: 1) 120 couples in fertile age, with at least one child and without known infertility problems, hereinafter referred to as fertile group (FG); 2) 147 couples with an infertility diagnosis medically established pursuing medical treatment [infertility group (IG)]; and 3) 59 couples who, despite presenting an infertility diagnosis, were applying for adoption but no current infertility treatment was being carried [adoption group (AG)] These couples had already completed their adoption application process. For the three groups further inclusion criteria were age (18 years or older) and being married or living with a partner in a heterosexual relationship (these are also Portuguese law requirements for access to Assisted Reproductive Technologies).

Instruments

A socio-demographic and clinical form was used to collect socio-demographic data (age, years of education, length of marriage/relationship) and clinical data (infertility duration, previous

treatments). A set of self-report instruments was completed. These instruments were chosen due to their psychometric characteristics:

Coping Styles Questionnaire (CSQ; 19), Portuguese version by Dinis and colleagues (40) is a 41-item questionnaire to assess three coping styles: emotional/detached (e.g., "See the situation for what it is and nothing more"), rational (e.g., "Try to find out more information to help make a decision about things") and avoidant (e.g., "Trust in fate – that things have a way of working out for the best"). Participants are asked to rate how they would describe the way they typically react to stress on a 4-point Likert scale. In our study a single factor (bipolar, with the emotional coping style items reverse coded) of emotional/detached coping style was used, as considered by Dinis and colleagues (41). Cronbach alphas for the different coping styles were as follows: emotional/detached coping style .72 in the FG, .80 in the IG and .72 in the AG; rational coping style .80 in the FG, .78 in the IG and .83 in the AG; and avoidant coping style .66 in the FG, .72 in the IG and .73 in the AG.

Acceptance and Action Questionnaire II (AAQ-II; 42), Portuguese version by Pinto-Gouveia and colleagues (43) is a 10-item self-report measure which assesses psychological inflexibility through experiential avoidance, defined as the unwillingness to remain in contact with particular private experiences and attempt to modify the form or frequency of these experiences or the contexts that originate them (e.g., "My painful memories prevent me from having a fulfilling life"). Participants are asked to rate how true each statement is for him/her on a 7-point scale

ranging from 1 = Never True to 7 = Always True. In the current study a Cronbach alpha of .86 was reported in the FG, and of .88 both in the IG and the AG.

Self-Compassion Scale (SCS; 44), Portuguese version by Castilho and colleagues (45) is a measure of self-compassion that includes 26 items endorsed on a 5-point Likert scale. In this study we used the self-compassion subscale that is a sum of the self-kindness (e.g. "I try to be loving towards myself when I'm feeling emotional pain"), common humanity (e.g., When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am"), and mindfulness (e.g., When I fail at something important to me I try to keep things in perspective). We also used the self-judgment subscale that corresponds to the sum of self-criticism (e.g. "I can be a bit cold-hearted towards myself when I'm experiencing suffering"), isolation (e.g. "When I'm really struggling I tend to feel like other people must be having an easier time of it") and over-identification (e.g. "When I'm feeling down I tend to obsess and fixate on everything that's wrong"). The self-compassion subscale presented a Cronbach alpha of .86 in the FG, of .90 in the IG, and of .81 in the AG. The self-judgment subscale revealed a Cronbach alpha of .87 in the FG, and of .92 both in the IG and the AG.

All instruments showed high or adequate internal consistency in our sample (46), except for the avoidant coping style subscale in the FG (Cronbach alpha of .66). However, according to DeVellis (47), internal consistency values around .60 may be acceptable in some cases in social sciences.

Procedures

The study was approved by Ethical Committees of the university where this study took place, of infertility public centers and clinical directors of private centers and was supported by the National Patients Association. An information sheet explaining the aims of the study was given to all participants and they were assured that anonymity and confidentiality would be maintained and that they could refuse to participate or withdraw from the study at any time.

The FG was collected, as a convenience sample, from the general population through a snowball sampling procedure.

The IG couples were asked to participate in the study by their medical doctors (the recruitment took place in four public clinics and three private clinics) and gave their informed consent. The questionnaires were taken home, completed and returned by mail to the research team (stationary post envelopes were provided).

The AG group couples also gave their informed consent and were recruited through Portuguese social services adoption offices. Based on records consultation these offices teams selected and contacted couples who met the defined inclusion criteria for this group. The set of self-report instruments was delivered by the adoption office during an appointment or mailed. The independence between the study participation and the adoption process was also assured. Once filled, the set of questionnaires was returned by mail directly to the research team.

Since this study included couples, both partners participation was required to perform dyadic analysis and they were given instructions to answer the questionnaires separately. Data collection took place between July 2009 and July 2011

Data analyses

All data were analyzed using SPSS (IBM SPSS Statistics for Windows, Version 20; Armonk, NY: IBM Corp.). Data analyses were conducted using the couple as a unit. To account for the non-independence of partners' scores the database was restructured and each partner score is a different variable of each couple scores (48).

One-way ANOVAs were conducted to explore whether there were differences between the three groups concerning age, years of education and length of relationship. Whenever differences between the groups were found, these differences were located through Tukey post-hoc tests.

Analyses of variance using the General Linear Model (GLM) for Repeated Measures were performed (for total scores), with Group (1-FG; 2-IG; 3-AG) as the between-subjects factor and gender (1-women; 2-men) as the within-subjects factor, so that within couple differences could be studied. Effect sizes are reported for all analyses using partial eta squares (ηp^2), corresponding to the proportion of the total variability of the dependent variable that is explained by the factor under study (49). Effects sizes were considered very high when > .5, high between .25 and .5, medium between .05 and .25, and small if $\leq$.05 (49). A confidence interval of 95% was used in all the analyses.

Results

Results regarding socio demographic characteristics for each group and mean comparisons between the groups are presented in Table 1.

Please, insert Table 1

When comparing the three groups, significant differences were found in years of education (F = 24.99; $p < .001$) and length of marriage/relationship (F = 66.07; $p < .001$). Regarding age and years of marriage/relationship the FG (Age: M = 36.79; SD = 5.71; length of relationship: M = 10.35; SD = 5.70) and the AG (Age: M = 37.30; SD = 6.16; length of relationship: M = 10.75; SD = 5.76) do not present differences. IG couples are the youngest ones (M = 34.63; SD = 5.05), being also married for less time (M = 6.10; SD = 3.55). Concerning years of education no differences were found between the FG (M = 13.79; SD = 3.72) and the IG (M = 14.09; SD = 3.51), being the AG (M = 11.31; SD = 4.19) the one with less years of education.

Further group characteristics were as follows: In the FG 65 couples (54.2%) have one child, 47 (39.2%) have two children and 8 (6.7%) have three children.

In the IG clinical data regarding infertility showed that participants had been diagnosed with fertility problems for almost 3 years (M = 2.95; SD = 2.83). The majority of them had already been submitted to infertility treatments (N = 108; 73.5%) and only 39 (26.5%) were pursuing their first treatment cycle.

The AG had been diagnosed fertility problems for approximately 8 years (M = 8.23; SD = 7.07). Most of them (74.6%) had previous attempts to get pregnant through medical treatment and only 25.4% selected adoption as the first choice for having a child.

Duration of infertility was not significantly correlated with any of the measures studied, both in the IG and in the AG groups.

Group comparisons regarding emotion regulation processes

Descriptive results concerning emotion regulation processes for each group are presented in Table 2. Group and gender main effects and group gender interaction effects are reported. Significant means and standard deviations for men and women are reported in the text. Although the groups differ regarding age, years of education and length of relationship these variables were not inserted as covariates because they were considered as defining characteristics of the groups.

Please insert Table 2

When considering the emotional/detached coping style there was a significant group direct effect. *Post hoc* mean comparisons revealed that IG couples are the ones showing the lowest use of this coping style (considered as an adaptive one) when compared with FG couples (p = .003) and AG couples (p < .001). FG couples also show a lower score in the emotional/detached coping style when compared to the AG couples (p = .048), although less marked. A significant gender direct effect was also found, with women showing lower scores than their male partners

(Women: *M* = 36.29, *SD* = 7.01; Men: *M* = 38.88, *SD* = 6.52). No significant group gender interaction effect was found.

Concerning the rational coping style there were no significant group or gender direct effects nor a group X gender interaction effect.

A significant group direct effect was found for avoidant coping style, with *post hoc* comparisons displaying that IG and AG couples do not present differences between them ($p = .713$). In turn, IG couples rely more on this coping style than FG couples ($p = .001$). AG couples also do that compared to the ones in the FG ($p < .001$). Gender direct effect and group gender interaction effect were not significant.

The group multivariate effect of psychological inflexibility/experiential avoidance showed to be significant and of medium, indicating that IG couples present higher scores of psychological inflexibility/experiential avoidance than the FG couples ($p = .001$) and the AG couples ($p < .001$), and these last two groups not showing differences between them ($p = .373$). There was also a within-subjects multivariate effect with women exhibiting more psychological inflexibility/experiential avoidance when compared to men (Women: *M* = 7.86, *SD* = 7.53; Men: *M* = 4.95, *SD* = 5.70). The group gender interaction effect showed to be significant, although of small size, stating that IG women reveal more psychological inflexibility/experiential avoidance than their husbands or partners (AAQ-II: *M* = 22.60; *SD* = 9.54 *vs*. *M* = 18.04; *SD* = 7.63, $p = .001$, $\eta^2p = .04$).

Regarding self-compassion there was a significant direct group effect, with *post hoc* mean comparisons showing that IG couples are less self-compassionate than the AG couples (p = .004), but no significant differences were found between the IG and the FG (p = 1.000) and the FG and the AG (p = .055). The gender direct effect was not significant. The group gender interaction effect was significant but of small.

For self-judgment (the sum of self-criticism, isolation and over identification), there was a significant group direct effect. P*ost hoc* mean comparisons showed that IG couples present higher scores of self-judgment than FG couples (p = .042) and AG couples (p < .001), with these last two groups not showing differences between them (p = .061). There was also a within-subjects multivariate effect with women revealing more self-judgment than men (Women: M = 34.82, SD = 9.43; Men: M = 30.85, SD = 8.87). The group gender interaction effect was significant, of small size with women from the IG showing more self-judgment than their male partners (SCS_judg: M = 37.73; SD = 9.58 *vs*. M = 31.21; SD = 9.32, p = .001, η^2p = .04).

Discussion

The current study aimed to compare emotion regulation mechanisms and coping styles between a group of couples pursuing medical treatment for infertility, a group of couples without known fertility problems and with at least one child conceived naturally, and a group of couples with fertility problems who were not pursuing medical treatment and were applying for adoption.

With regard to age, years of education and years of marriage/relationship, we found that the IG was younger and married or living with a partner for less time, which reflects a pattern found in other international studies (50, 51). On the other hand, the AG was found to have less years of education. These results are in line with what we expected. Since FG couples had one or more children and AG couples had a longer infertility history and most of them had undergone previous treatment (unsuccessfully) before applying for adoption, we would expect them to be older and to have a longer relationship. Regarding AG years of education, we can also equate this may be associated with a lower socioeconomic status, which limits access to infertility treatments, especially in private clinics, given the high financial costs involved. Thus, we believe that the observed differences reveal representative features of the study groups.

Regarding emotional/detached coping style, considered an adaptive style in which individuals tend to distance themselves from stressful situations, the three groups are somewhat different, but no group gender interaction effect was found. IG couples are the ones who tend to use less this coping style, followed by FG couples and, lastly, by AG couples. We hypothesize that couples that are still undergoing treatment may have more difficulties distancing themselves from the infertility situation. On the other hand, AG couples, who are in a different stage of their efforts to become parents, already had the opportunity to gain perspective on the situation, being more able to distance themselves. When considering the rational coping style, no differences were found between the groups, which lead us to believe that couples from our sample show a similar trend for problem solving when faced with stress-inducing events. Also with regard to coping styles, the avoidant style is more used by the two groups of couples facing infertility than

by FG couples, indicating that the former are more likely to avoid events or situations that cause stress. Maybe because they encounter a number of difficulties that couples without fertility problems have not had to experience, these two groups have a higher tendency to use avoidance strategies as a way to protect themselves from suffering.

In general our results suggest that people facing fertility problems tend to show maladaptive coping strategies. Previous studies with infertile patients point to the existence of a relationship between dysfunctional coping styles and depression, anxiety, personal, marital and social stress (e.g., 32, 33, 34). As such exhibiting these maladaptive coping styles may be seen as sign of possible psychological difficulties and therefore they should be assessed and targeted at early stages of the infertility treatment to prevent mental health problems.

Although, apparently, psychological inflexibility/experiential avoidance resembles a coping style, Fledderus, Bohlmeijer and Pieterse (52) report an important distinction. According to these authors, psychological inflexibility/experiential avoidance reflects the extent to which individuals engage in attempts to modify the form, frequency, or situational sensitivity of unwanted private events. In turn, coping styles have to do with the frequency with which a strategy is used and the content of behavior to deal with inducing stress situations. Given this distinction, experiential avoidance focuses more on function and context of behavior, while coping styles bind over the frequency and content of behavior. Concerning psychological inflexibility/experiential avoidance, we found that IG couples are the ones who show higher scores, with FG couples and AG couples not differing from each other. Furthermore, in the IG,

women present higher levels of psychological inflexibility/experiential avoidance. They seem to carry on more efforts to control or avoid painful thoughts (e.g., “I will never be a mum”, “What if this treatment doesn´t work”, “This is too painful for me”), feelings (e.g., shame, jealousy, anxiety) or bodily sensations. In this sequence, we can then consider that IG couples, particularly women, are more unwilling to tolerate painful private events (e.g., thoughts, feelings, bodily sensations) and make efforts to control or modify their form, frequency, duration or intensity as well as the contexts that give rise to them, even if this leads to behaviors that are not congruent with their values (53). It is also worth noting that experiential avoidance, being a verbally mediated process, can function as a strategy that induces some immediate relief from painful emotional experience, but as time goes by, its use may be counterproductive (54).

Concerning self-compassion, AG couples show a greater tendency to display an attitude of willingness of negative aspects of self and life. According to Neff (31), we are referring to the ability to be compassionate and kind to oneself, the ability to understand ones experiences as part of a broader human experience, and the awareness and acceptance of one’s experience, even if it is a painful one.

With regard to self-judgment, understood as the set of dimensions of self-criticism, isolation and over-identification, higher values are reported by IG couples, followed by FG couples and, finally, by AG couples. This finding suggests that facing infertility and the demands of medical treatment, leads these couples, and again particularly women, to be more self-judgmental, more critical and punitive towards themselves, feel that their experience isolates them from others, and

identify themselves excessively with the infertility problem (31). In turn, AG couples seem to be more self-compassionate, and more able to modify painful or ineffective behavior patterns.

Overall, this study aimed to explore the existence of differences among three groups of couples who presented different pathways in achieving the goal of becoming parents. Given the paucity of data regarding emotional regulation processes in these groups, we were interested in exploring differences not only between groups, but also considering gender. Nonetheless, our findings should be interpreted considering some methodological limitations. The study was cross-sectional and relies on self-report data. This design limits robust causal conclusions to be drawn and points to the need of future replication studies with a longitudinal design, using other instruments such as semi-structured interviews. In addition, the use of a heterogeneous group of couples, at different stages of medical treatment, may add confounding variables which should be controlled in future research. In fact, previous studies have pointed that there is variability in psychological variables when considering the timing of the assessment along the infertility course (2, 7). Differences in emotional states can occur when considering different stages of infertility treatment (e.g., 50, 55). For example, Mahajan and colleagues found that women report lower positive affect and higher negative affect and state anxiety at oocyte retrieval and embryo transfer days (56). Furthermore, the IG group is not representative of infertile couples in general because it does not include those couples who may decide not to pursue infertility treatment. We suggest that future studies should be conducted in larger samples in order to control for these variables (e.g., couples at different stages of medical treatment, couples who decided to remain childless).

Similarly, the AG includes couples who did not seek medical treatment for their fertility problem and couples who have chosen to adopt as a result of unsuccessful medical treatment, which can also be a confounding variable.

Despite these methodological concerns, our findings add some important topics to the existing literature and may have some clinical implications. Firstly, as already mentioned, coping styles have attracted greater interest in the literature when it comes to infertility, however, our study adds the addressing of other psychological processes that can be seen as emotion regulation processes. These constructs come from a different theoretical perspective that has been explored by more recent approaches such as contextual therapies or 3rd wave cognitive behavioral therapies. The study also adds the possibility of comparing IG couples with other groups of couples, with different pathways regarding parenthood. It is also worth of note that this study is innovative due to the use of dyadic analysis. From our knowledge this is the first study that addresses these psychological processes using the couple as unit of analysis. This dyadic design allows integrating simultaneously the data from both partners also accounting for the interdependence of the couple data. Obviously, as mentioned before, the study design does not allow establishing causal relationships between psychological processes and infertility, nor clarify the development of specific emotion regulation processes in each group. Nevertheless, and from a clinical perspective, when working on psychological difficulties in patients dealing with infertility it is important to bear in mind the role of emotion regulation processes, particularly in women, that may contribute to the increasing of psychological suffering. These findings emphasize the relevance of assessing emotion regulation processes and coping styles in

couples dealing with the strains of infertility medical treatment, especially the female partner, due to the association between dysfunctional ways of regulating one's emotions and psychopathology. In fact emotion regulation mechanisms may play a risk or protection role regarding mental health and their early screening may prevent the onset and/or the exacerbation of emotional difficulties.

Conclusions

The relationship between the use of different emotion regulation processes and psychopathological symptoms is well recognized (17). Attending to our findings, emotion regulation processes such as experiential avoidance, self-compassion and self-judgment seem to be vulnerability factors, particularly in the female partner of couples pursuing infertility medical treatment. Consequently these emotion regulation processes can be seen as clinical targets in psychological interventions designed for people dealing with infertility medical treatment. In line with the current investigation, findings suggest that the Mindfulness Based Program for Infertility (57), Acceptance and Commitment Therapy (53) and Compassion-Focused Therapy (28) may be adequate approaches for patients dealing with infertility. These contextual cognitive-behavioral therapies explicitly address emotion regulation skills and may expand the effectiveness of psychotherapeutic interventions.

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Table 1

Table 1. Mean comparisons of the three groups regarding age, years of education and years of marriage/relationship

	FG (*N* = 120)		IG (*N* = 147)		AG (*N* = 59)				
	M	***SD***	***M***	***SD***	***M***	***SD***	***F*** (2, 649)	***p***	**Tukey *post-hoc***
Age	36.79	5.71	34.63	5.05	37.30	6.16	14.76	<.001	FG>IG; AG>GI
Years of education	13.79	3.72	14.09	3.51	11.31	4.19	24.99	<.001	FG>AG; IG>AG
Years of marriage/relationship	10.35	5.70	6.10	3.55	10.75	5.76	66.07	<.001	FG>IG; AG>IG

Table 2

Table 2. Means and standard deviations concerning emotional/detached coping style (CSQ_emo/det), rational coping style (CSQ_rational) and avoidant coping style (CSQ_avoid), psychological inflexibility/experiential avoidance (AAQ-II), self-compassion (SCS_comp), and self-judgment (SCS_judg), group and gender main effects and group X gender interaction effect

	Group						Main effects and interaction effects					
	FG		IG		AG		Group		Gender		Group Gender	
	(*N* = 240)		(*N* = 294)		(*N* = 118)							
	M	***SD***	***M***	***SD***	***M***	***SD***	***F***	η^2p	***F***	η^2p	***F***	η^2p
CSQ_emo/det	38.15	5.75	36.10	7.53	40.12	6.47	14.85***[a]	.08	22.53***	.07	2.48	.02
CSQ_racional	16.48	4.24	15.60	4.29	16.42	5.21	2.46	.02	3.18	.01	1.30	.01
CSQ_avoid	9.47	3.73	11.06	4.42	11.69	4.96	10.85***[b]	.06	1.36	.00	.35	.00
AAQ-II	17.43	7.26	20.32	8.92	15.86	7.70	12.57***[c]	.07	18.44***	.05	6.85***	.04
SCS_comp	41.22	7.74	40.50	8.65	43.53	7.26	5.20**[d]	.03	.84	.00	3.36*	.02
SCS_judg	32.34	7.97	34.47	9.99	29.75	9.55	10.04***[c]	.06	29.60***	.08	7.46***	.04

* $p < .05$; ** $p < .01$; ***$p \leq .001$

[a] IG <FG < AG; [b] IG >FG; AG > FG; [c] IG > FG; IG > AG; [d] IG < AG

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