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Infertility-related stress and depressive symptoms – the role of experiential avoidance: a cross-sectional study

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ABSTRACT

Objective: The current study aimed to explore the mediating role of experiential avoidance in the relationship between infertility-related stress (impact of infertility in women's life and representations about the importance of parenthood) and depressive symptoms.

Background: Infertility is a stress inducing condition presenting many challenges to individuals facing this diagnosis, particularly to the ones who decide to pursue medical treatment. One of its consequences may be the experience of depressive symptoms which have also been associated with increased infertility-related stress. Moreover, experiential avoidance, conceptualised as an emotion regulation process, has also been connected to psychopathological symptoms, particularly depressive symptoms.

Methods: The sample consisted of 124 women presenting an infertility diagnosis who were pursuing medical treatment for fertility problems. Participants were recruited through the national patients' association website and completed the following self-report instruments: a sociodemographic and clinical questionnaire, the Acceptance and Action Questionnaire-II (AAQ-II), the Fertility Problem Inventory (FPI) and the Depression, Anxiety and Stress Scales 21 (DASS-21).

Results: Results showed that representations about the importance of parenthood were associated with depressive symptoms indirectly, throughout the association with the impact of infertility in women's life and use of experiential avoidance.

Conclusions: Experiential avoidance can be considered a relevant emotion regulation process to be targeted in psychological intervention programs for women facing infertility.

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KEYWORDS

Infertility; Infertility-related stress; Depressive symptoms; Experiential avoidance; Mediation analysis

Introduction

According to the International Glossary on Infertility and Fertility Care, infertility is 'A disease characterised by the failure to establish a clinical pregnancy after 12 months of regular, unprotected sexual intercourse or due to an impairment of a person's capacity to reproduce either as an individual or with his/her partner.' (Zegers-Hochschild et al., 2017, p. 401). It is estimated that approximately 9% of couples of childbearing age around the world face fertility problems (Boivin, Bunting, Collins, & Nygren, 2007). More recently, Datta et al. (2016) stated that one in eight women and one in ten men experience infertility.

The inability to conceive a child is described as a stressful moment in the couples' lives, as an uncontrollable situation, threatening the achievement of important life goals and consuming significant resources, particularly for couples seeking medical treatment (Almeida-Santos & Moura-Ramos, 2010; Burns & Covington, 2006). For those pursuing assisted reproductive technologies, there are several additional demands (e.g. physical stress of daily self-injections, medical examinations, oocyte retrieval, embryo transfer), particularly for the female partner. In line with this idea, Cserepes, Kollár, Sápy, Wischmann, and Bugán (2013) found that infertility-related global stress, infertility-related social concerns, and general health problems tend to be more severe on women, when compared to their male partners.

Infertility-related stress has been conceptualised as a construct that encompasses the impact of the infertility experience on the social, marital and sexual domains, as well as the need for parenthood and the rejection of a future lifestyle without children (Newton, Sherrard, & Glavac, 1999). In fact, facing an infertility diagnosis may trigger the occurrence of thoughts associated to the importance of parenthood in one's life (identification with parental role and perception of parenting as a primary and essential life goal) and rejection of childfree lifestyle (negative view of this lifestyle, vision of future happiness as dependent on the existence of a child or having another child). Furthermore, it may induce social concerns (sensitivity to comments, feelings of social isolation, alienation from family and friends), sexual concerns (decreased sexual pleasure, feelings of pressure to schedule sexual intercourse), and relationship concerns (difficulty in discussing infertility with the partner, difficulty in understanding gender differences in reactions to infertility, worries about the impact of infertility on the relationship).

Based on these domains, a useful conceptualisation may be the one suggested by Moura-Ramos, Gameiro, Canavarro, and Soares (2012) that infertility-related stress comprises two second-order dimensions: representations about the importance of parenthood (beliefs regarding parenthood and childlessness in couples' lives) and the impact of infertility on different domains of couples' lives (life areas that are affected by infertility). Parenthood, and particularly motherhood, can be considered as an important developmental milestone and for some women it is a core aspect of their identity (Lee, Sun, & Chao, 2001). Perceiving parenthood as a core goal in life and having difficulties in imagining a life without children may enhance the impact of infertility in one's life. For someone who values parenthood, encountering obstacles in conceiving may induce stress in several life areas that become affected by the infertility experience. For instance, Greil, Shreffler, Schmidt, and McQuillan (2011) found that higher importance of motherhood was associated with higher fertility specific distress, regardless of being or not in treatment.

In addition to stress, depression is another psychological condition that has deserved the interest of researchers within the infertility area. Previous studies that addressed depression/depressive symptoms in people facing infertility have produced several conclusions: psychological treatment should be considered before infertility treatment, to improve mental health and quality of life among people with infertility (Noorbala, Ramezanzadeh, Abedinia, & Naghizadeh, 2009); depression or anxiety levels increase after infertility treatment failure (Maroufzadeh, Karimi, Vesali, & Omani-Samani, 2015); women with infertility who have a history of depression are more likely to become depressed during treatment (Holley et al., 2015); people with infertility who are undergoing treatment show a higher prevalence of

depressive symptoms compared to control groups (Chen, Chang, Tsai, & Juang, 2004; Volgsten, Skoog, Ekselius, Lundkvist, & Sundstrom, 2008; Williams, Marsh, & Rasgon, 2007). Although some studies pointed to a higher prevalence of depressive phenomena in people struggling with infertility, there were also other studies that mentioned that these people may present depressive symptoms as part of emotional reactivity to a demanding life crisis as infertility, but most of them tend to adjust (Verhaak, Lintsen, Evers, & Braat, 2010). Nevertheless, severe depressive symptoms were significantly associated with increased infertility-related distress at the individual and partner level (Peterson, Sejbaek, Pirritano, & Schmidt, 2014).

Although the literature has been pointing to the existence of psychological consequences associated with the diagnosis and treatment of infertility, the role of emotion regulation processes, such as experiential avoidance, has been less explored. Experiential avoidance, or psychological inflexibility, is described as encompassing two related components: unwillingness to remain in touch with aversive private experiences (including bodily sensations, emotions, thoughts, memories, and behavioral predispositions), and action to change aversive experiences or the events that trigger them (Hayes & Smith, 2005). Thus, experiential avoidance can be conceptualised as an emotion regulation strategy aimed at providing short-term relief from unwanted internal experiences. In some situations, subtle avoidance or suppressed behavior can be seen as a self-protection strategy to avoid seemingly disastrous consequences such as trying not to show signs of anxiety (Kashdan, Barrios, Forsyth, & Steger, 2006). In these contexts, the same authors state that experiential avoidance is a relatively benign short-term strategy for controlling emotional expression, where negative consequences may be minor. Though, experiential avoidance can also be a maladaptive process when the response pattern is rigid and inflexible, associated with negative mental health outcomes and poor quality of life (Chawla & Ostafin, 2007). Immediate effects are generally positive because the short-term consequences are more valuable than the long-term ones, assuming the function of emotional regulation (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). For example, the experience of dealing with an infertility diagnosis and the demands of medical treatment may lead to an increase in negative self-referential thoughts and depressive or anxiety feelings. This may contribute to the avoidance of situations such as family or friends meetings, where there will be children, or the avoidance of these thoughts/feelings through trying to suppress them. Thus, avoiding or escaping events act as responses to the original private events that become negatively reinforced and play a role in the establishment of a series of increasing negative affect and avoidance (Kanter, Busch, Weeks, & Landes, 2008). Several studies suggest that experiential avoidance can be seen as a susceptibility factor for the development and maintenance of psychopathology (Chawla & Ostafin, 2007). According to Hayes et al. (2004) experiential avoidance modifies the individual's emotional experience thereby increasing psychological suffering and intensifying depressive symptoms. Mellick, Vanwoerden, and Sharp (2017) found that experiential avoidance seems to act as a vulnerability factor for major depressive disorder in female adolescents. In fact, a strong positive relationship between experiential avoidance and depression has been found in numerous studies (e.g. Hinds, Jones, Gau, Forrester, & Biglan, 2015; Spinhoven, Drost, de Rooij, van Hemert, & Penninx, 2014), even with sub-clinical levels of depression (Tull, Gratz, Salters, & Roemer, 2004), and regardless of negative

affect (Shahar & Herr, 2011). Experiential avoidance was also identified as a mediator between the effects of rational coping and detached/emotional coping on depression and stress in people with chronic pain (Costa & Pinto-Gouveia, 2011). Previous research using a naturalistic approach of experiential avoidance found that it is a context-specific regulatory strategy (Machell, Goodman, & Kashdan, 2015). Although individuals who tend to use experiential avoidance as an emotion regulation strategy may be more prone to increased levels of stress, experiential avoidance may also act as a maladaptive mechanism leading to the maintenance of those stress levels.

Studies addressing experiential avoidance in people dealing with infertility are scarce but couples with an infertility diagnosis pursuing medical treatment presented significantly higher scores of experiential avoidance when compared to fertile couples and couples applying for adoption (Cunha, Galharado, & Pinto-Gouveia, 2016). Therefore, the aim of the current study was to explore the mediating role of experiential avoidance in the relationship between infertility related stress (representations about the importance of parenthood and impact of infertility on life domains) and depressive symptoms. In the hypothesised model, representations about parenthood that include the identification with the parent role, considering that being a parent is a major life goal and having a negative view of a life without children, may determine how intense is the impact of an infertility diagnosis in life domains (social, sexual and relationship). A higher impact on life domains is expected to demand the use of emotion regulation processes such as experiential avoidance (by trying to avoid those experiences, to suppress them or to modify them) which in turn would be associated to higher depressive symptoms.

Methods

Participants

The study was conducted in a sample of 124 women presenting an infertility diagnosis who were pursuing medical treatment for infertility. Inclusion criteria were age (18 years or older), and an infertility diagnosis (medically established).

Procedure

The study was previously approved by the APFertilidade (national patients' association) board and followed the principles of the Declaration of Helsinki. Participants were invited to participate through this association Forum, Newsletter and social media. Participants were informed about the study aims, the fact that their participation was voluntary and anonymous, and about the confidentiality of the collected data. Those wishing to take part were asked to indicate their consent. Once consent had been obtained participants were directed to the questionnaires (GoogleDocs platform), which were completed online. Clinical information regarding infertility was provided by the participants (there was no consulting of medical records). Data collection took place between March and June 2016.

Instruments

A socio-demographic and clinical form was used to collect socio-demographic data (age, years of education, and marital status) and clinical data (infertility duration, infertility factor, previous treatments, and current treatment).

Fertility Problem Inventory (FPI; Newton et al., 1999), Portuguese version by Moura-Ramos et al. (2012). FPI is a 46-item inventory designed to assess infertility-related stress. FPI encompasses 5 domains: 1) Social concern; 2) Sexual concern; 3) Relationship concern; 4) Need for parenthood; 5) Rejection of child-free lifestyle. In the current study we used the two second order factors 'representations about the importance of parenthood' and 'impact on life domains' and Chronbach alphas of 0.88 and 0.90 were found, respectively.

Depression, Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995), Portuguese version by Pais-Ribeiro, Honrado, and Leal (2004). The DASS-21 was developed to assess depression, anxiety, and stress. In the current study we only used the depression subscale. This subscale includes 7 items related to loss of self-esteem, loss of motivation, and perception of not being able to achieve important life goals. In this study the Cronbach alpha of DASS-21 was 0.90.

Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011), Portuguese version by Pinto-Gouveia, Gregório, Dinis, and Xavier (2012). The AAQ-II is a 7-item questionnaire that assesses experiential avoidance. In the current study, the AAQ-II Cronbach's alpha was .94.

Statistical analysis

Statistical analysis was performed using the Software SPSS Statistics (v.22; IBM SPSS Statistics). Sk and Ku values did not indicate a severe violation of normality. There were no missing data. Pearson correlation coefficients were used to examine associations between the study variables and between these and age, time since diagnosis and number of previous infertility treatments. The mediation model analysis was tested with the SPSS Process macro, according to Hayes (2013) recommendations. A serial multiple mediator model was tested (model 6, PROCESS). According to this model, the direct and indirect effects between the representations on importance of parenthood (Independent variable – IV) and depressive symptoms (DV) were examined while modeling the association between the representations on importance of parenthood and the impact of infertility on life domains (Mediator – M1), and between the latter and the use of emotion regulation processes, such as experiential avoidance (Mediator – M2).

The significance of the mediating effects was ascertained using bootstrap procedures with 5000 samples, following recent recommendations (MacKinnon & Fairchild, 2009; Mackinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002). An indirect effect is considered significant when the confidence interval does not include 0.

Results

Sample characteristics

Participants' age ranged from 27 to 44 years old, with a mean of 35.81 years old ($SD = 4.24$). Years of education ranged from 6 to 24 years ($M = 15.62$; $SD = 3.15$).

Regarding marital status, 79 women were married (63.7%) and 45 were living with a partner (36.3%). Participants' clinical characteristics, such as infertility duration, causes, previous and current infertility treatment are presented in Table 1. One hundred and two participants (82.3%) had previously undergone infertility treatment and 22 (17.7%) were pursuing treatment for the first time. Regarding third-party reproduction treatments, 19 participants (15.3%) were using donated oocytes or sperm and 105 (84.7%) were undertaking treatment with their own gametes.

Test of the mediation model

Table 2 presents means and standard deviations for representations about the importance of parenthood, impact of infertility on life domains, experiential avoidance and depressive symptoms. All variables were significantly and moderately to strongly correlated.

The serial multiple mediation model is depicted in Figure 1. The model examines the direct and indirect effect of representations about parenthood on depressive symptoms, by modeling the mediation effects of representations about the importance of parenthood on the impact of infertility on participants' life domains and of this on experiential

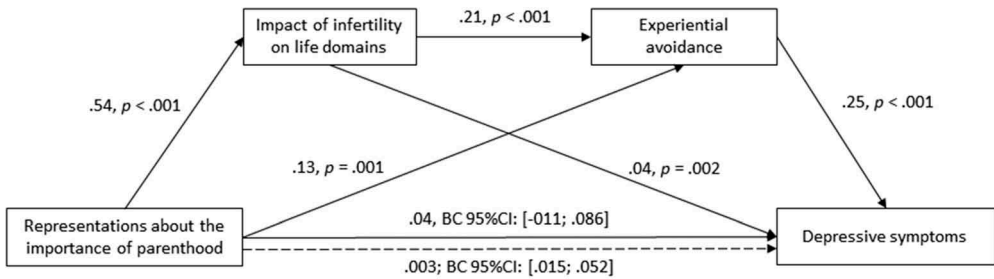
Table 1. Participants' clinical characteristics.

	<i>M</i>	<i>SD</i>
Infertility duration (<i>N</i> = 124)	5.04	3.95
	<i>N</i>	%
Infertility factor (<i>N</i> = 124)		
Female	47	37.9
Male	30	24.2
Unknown	27	21.8
Female and male	20	16.1
Previous infertility treatment (<i>n</i> = 102)		
Intra-Cytoplasmic Sperm Injection (ICSI)	30	24.2
<i>In Vitro</i> Fertilization (IVF)	30	24.2
Ovarian Hormonal Stimulation (independent from IVF or ICSI)	19	15.3
Intra-Uterine Insemination (IUI)	14	11.3
Multiple treatments	17	13.7
Current infertility treatment (<i>N</i> = 124)		
Waiting for treatment	45	36.3
Waiting for tests or medical exams	33	26.6
<i>In Vitro</i> Fertilization (IVF)	19	15.3
Intra-Cytoplasmic Sperm Injection (ICSI)	17	13.7
Ovarian Hormonal Stimulation (independent from IVF or ICSI)	7	5.6
Intra-Uterine Insemination (IUI)	3	2.4

Table 2. Descriptives and correlations between study variables.

	<i>M</i>	<i>SD</i>	Representations about the importance of parenthood	Impact of infertility on life domains	Experiential avoidance
Representations about the importance of parenthood	80.77	24.87	-		
Impact of infertility on life domains	74.35	15.99	.35*	-	
Experiential avoidance	32.07	10.58	.37*	.57*	-
Depressive symptoms	7.30	5.35	.36*	.52*	.65*

**p* < .001



Serial multiple mediation model
 Straight lines represent the direct effect. The dotted line represents the indirect effect from the bootstrap analysis.
 BC 95% CI = Bias corrected 95% confidence interval

Figure 1. Serial multiple mediation model.

avoidance. The direct effect of representations about parenthood on depressive symptoms is nonsignificant (effect = .04, SE = .02, $p = .127$). The indirect effect of representations about the importance of parenthood on depressive symptoms, while modeling the influence of the intervening variables, is statistically significant (Indirect effect = 0.03, 95%CI: [.015; .050]).

Straight lines represent the direct effect. The dotted line represents the indirect effect from the bootstrap analysis. BC 95% CI = Bias corrected 95% confidence interval.

Test of alternative models

Because the study was cross sectional, the establishment of mediated (or indirect) effects does not assume causality. The sequence of the tested model was established theoretically, with representations about the importance of parenthood being the antecedent variable, psychopathological (depressive) symptoms as the outcome or dependent variable, and the impact of infertility on life domains and experiential avoidance as potential mediator variables. However, an alternative model may be plausible. Indeed, it may be possible that people facing infertility that highly value parenthood tend to avoid situations and feelings related to children and this may be associated with higher impact of infertility on life domains (e.g. social isolation, poor sexual relationship), which would be associated with depressive symptoms. This alternative model was tested. The result on the indirect effect of this serial multiple mediation model included 0 and therefore was not significant (Indirect effect = 0.01, 95%CI: [.00; .03]).

Discussion

Experiential avoidance has been pointed as an important transdiagnostic factor that influences the course of emotional problems (Spinhoven et al., 2014). Besides being a putative factor for the onset and maintenance of a wide range of psychopathological symptoms, it also revealed to act as a transcultural process (Monestès et al., 2016). In this context, exploring the construct of experiential avoidance, as a maladaptive emotion

regulation process, in people dealing with the multifaceted condition of infertility was considered the core aim of the current study. To our best knowledge the role of experiential avoidance in the relationship between infertility-related stress and depressive symptoms has not deserved much research attention. Therefore, this study aimed to address the role of the impact of infertility on life domains and of experiential avoidance acting in the relationship between the representations about the importance of parenthood and depressive symptoms.

In fact, the theoretical model tested showed that the sequence in which representations about the importance of parenthood impact on depressive symptoms comprises these representations leading to a higher impact of infertility on life domains and this impact on life domains being dealt with the use of experiential avoidance leading to depressive symptoms. Our results also showed that there is a direct effect of the impact of infertility on life domains and depressive symptoms. This relationship between infertility-related stress and depressive symptoms has been previously established (Peterson et al., 2014). However, the mediating effect of experiential avoidance was not addressed in this specific population. An indirect effect of the impact of infertility on several life areas on depressive symptoms, mediated by experiential avoidance, was also found. Thus, the strategy of experiential avoidance, used to attenuate the suffering resulting from infertility, may contribute to the enhancement of these depressive symptoms. Efforts to control, suppress, or avoid emotions may have paradoxical effects (Boulanger, Hayes, & Pistorello, 2010; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Furthermore, previous studies also suggested that experiential avoidance is a context-specific regulatory mechanism with adverse effects on daily well-being (Machell, Goodman, & Kashdan, 2015) and this may exacerbate the impact that infertility seems to entail for people's lives.

Results also point that valuing being a parent and not being able to achieve this desired goal doesn't seem to directly influence the development of depressive symptoms. Moreover, considering being a mother a valued aspect and having a negative view of not having children in one's life, doesn't seem to directly affect the occurrence of depressive symptoms. Nevertheless, the importance of parenthood in one's life and the rejection of a childfree lifestyle seem to contribute to the emergence of social, sexual and relationship concerns and these may encompass difficult emotional states. In face of emotional difficulties, using experiential avoidance as a way of not being in contact with these aversive experiences may lead to depressive symptoms. For instance, a woman for whom being a mother is a core aspect and considers her happiness to be dependent on the existence of a child, one would expect that infertility impacts on several life domains, such as social (e.g. social situations with children or pregnant women), sexual (e.g. sexual intercourse being avoided because it is a reminder of infertility), and relationship concerns (e.g. worries about drifting apart from the partner).

This study allowed identifying one process by which the experience of infertility and its effect in individual, social, marital, and sexual life and depressive symptoms are linked. Indeed, findings highlight the potential utility of targeting experiential avoidance as a process for improving mental health outcomes, particularly depressive symptoms, among women facing infertility. In this context, therapeutic approaches such as Acceptance and Commitment Therapy or the Mindfulness Based Program for Infertility may be particularly useful since they address experiential avoidance and have proved to

be effective (Galhardo, Cunha, & Pinto-Gouveia, 2013; Peterson & Eifert, 2011; Peterson, Eifert, Feingold, & Davidson, 2009).

The results of the current study also need to be considered in light of several limitations. The study was cross sectional, which does not allow establishing any causation between the study variables and experiential avoidance was assessed through a general measure that may not capture specificities of the infertility context. Even though a sequential mediation effect was tested, the framework to establish the sequence of the variables is a theoretical one, and not a temporal one. Further studies using a prospective design could clarify the role of experiential avoidance in the long-term adjustment. Another limitation concerns the recruitment process that was used, an online survey. Although online surveys allow the recruitment of a larger number of participants, offering a sense of privacy that may facilitate the disclosure of sensitive data, they have some limitations, including sampling bias, self-selection issues (e.g. women less likely to report depressive symptoms being more prone to participate), or under-representation of the population (e.g. tends to recruit more educated participants, with easy access to online platforms), and therefore limits the possibility to make generalizations regarding the study's findings (Wright, 2005). Moreover, the sample is highly heterogeneous, with women having different experiences and being assessed at different stages of their infertility experience.

In summary, this study contributed to a better understanding of the process linking the experience of infertility and depressive symptoms, which is of clinical relevance. Results suggest that the tendency of women with infertility to avoid thoughts, emotions and situations somehow associated with pregnancy and parenthood, as a way of trying to escape from the infertility painful experience, induces higher suffering. Consequently, this core emotion regulation process should be addressed by psychologists in the clinical context.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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