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The indirect effect of contextual factors on the emotional distress of infertile couples

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Abstract

Few studies were dedicated to study the role of contextual factors, such as the socioeconomic status and urban rural residence in emotional distress of infertile couples. This study aimed to explore the impact of contextual factors on emotional distress, either directly or by affecting the importance of parenthood in one's life which in turn affects emotional distress. In this cross-sectional study, 70 couples recruited during hormonal stimulation phase prior to IVF completed clinical and sociodemographic forms and self-report questionnaires assessing representations about the importance of parenthood and emotional distress. Path analysis using structural equation modelling was used to examine direct and indirect effects among variables. Results indicated that social economic status and Urban-Rural residence had an impact in emotional distress by affecting the representations about the importance of parenthood in one's life. Gender differences were found regarding model paths, suggesting that the social context may contribute more to women's emotional distress than to their partners' distress. When delineating psychological interventions, health care providers should consider that cultural values about children and parenthood contribute to shape the infertility experience

Keywords: Infertility, Infertility stress, emotional distress, indirect effects, path analysis, couple analysis

Infertility is clinically defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (Zegers-Hochschild et al., 2009). It is estimated that infertility affects 9% to 10 % of the population (Boivin, Bunting, Collins, & Nygren, 2007) and more and more couples who want to have children have to undergo Assisted Reproductive Technology (ART). Indeed, statistics show a steady increase in the number of ART cycles done every year across Europe, with more than 400.000 cycles being conducted every year (Andersen et al., 2009). Although infertility is a medical condition, its social meaning and impact cannot be neglected (Cook, 1987; Greil, 1997; Jacob, McQuillan, & Greil, 2007; Todorova & Kotzeva, 2006). Parenthood is one of the most important roles in the individuals' life and it is highly valued in society. Men and women are often expected to become parents and in some cultural or social contexts failure to achieve parenthood can be stigmatizing, meaning that it can be seen as a "deviant behaviour" from the social norm (Bulcroft & Teachman, 2003; Slade, O'Neill, Simpson, & Lashen, 2007; Whiteford & Gonzalez, 1995). Therefore, the experience of infertility and its treatment is thought to be affected by other dimensions of one's life such as the couples' context. Specifically, the aim of the study was to explore the predictive value of two contextual factors (SES and urban-rural residence) that are expected to shape the value individuals attribute to parenthood, in explaining the emotional distress of infertile individuals. With this aim, the study examined both direct and indirect (i.e. by affecting the representations about the importance of parenthood in women and men's lives) effects of these variables on emotional distress. Identifying contextual determinants of the emotional distress in infertility can help professionals to identify couples with a greater need of psychological intervention.

It has been acknowledged that the impact of infertility and assisted reproductive technology in couples' life has to be considered within the broader context that includes social and cultural aspects (Hardy & Makuch, 2002). Although involuntary childlessness in the

western countries tends to be much more accepted and its emotional and social consequences less severe when compared to developing countries (Daar & Merali, 2002; Dyer, Abrahams, Hoffman, & van der Spuy, 2002; Van Balen & Bos, 2009), factors like educational level, socioeconomic status, urbanity or others still shape cultural values about parenthood and child wish (Cassidy & Sintrovani, 2008; Purewall & Van den Akker, 2007; Van Balen & Inhorn, 2002). Role expectations related to parenthood may be less pronounced in an urban context when compared to non-urban contexts, where social expectations are more traditionalistic and pronatalistic (Baru & Dhingra, 2004). Similarly, previous studies have reported that couples with lower education and lower socioeconomic status were more negatively affected by infertility and its treatment than couples with higher socioeconomic status and education (Beutel et al., 1999; Drosdzol & Skrzypulec, 2008; Fekkes et al., 2003; McQuillan, Greil, White, & Jacob, 2003; Newton, Sherrard, & Glavac, 1999). Thus, these factors should be taken in account when investigating the impact of the infertility experience.

In this study, we argue that contextual factors, such as SES and urban-rural residence, shape personal meanings about the importance of parenthood in one's life by defining social expectations about childlessness, and that by doing so they will have an effect in emotional distress in couples undergoing ART. In this line of thinking, Van Balen and Inhorn (2002) also argued that "to fully understand the impact of infertility, the notion of child desire – the perceived importance of having children – must be interrogated in a variety of global settings" (p. 8).

Indeed, in a study by Fekkes et al. (2003), results indicated that women planning In Vitro Fertilization (IVF) exhibited more emotional problems than women in the general population and that this difference was much larger in the youngest age group. Similar results were found for men of the youngest age group. To explain these results, the authors suggested that younger couples that were trying to get pregnant earlier than the average Dutch population

might had a stronger need for parenthood and thus could have been more stressed than older women by the inability to conceive. This group of younger men and women also had a lower educational level than IVF women in the older age groups, and both men and women in this group showed more irrational parenthood cognitions (i. e. “A life without children is useless and empty”) than did older couples planning IVF. Therefore, the heightened importance of parenthood in individuals’ life may have intensified the emotional distress. Similarly, Newton et al. (1999) found that both men and women with fertility problems who reported higher need for parenthood and higher rejection of childfree lifestyle had more symptoms of depression and anxiety.

In conclusion, those couples whose social and cultural context contributes to highlight the centrality of the parental role in one’s life are expected to experience more emotional difficulties if confronted with fertile problems.

Because role expectations about parenthood are also largely affected by gender, to understand the actual meaning that infertility has on the life of men and women, it has to be considered within the context of gender roles (Abbey, Andrews, & Halman, 1991; Hardy & Makuch, 2002). Therefore, it can be assumed that the role of contextual variables may have a somewhat different impact in men and women’s adjustment depending on the importance of parenthood in their lives.

Indeed, because infertility is socially constructed, more traditional or less educated contexts may exacerbate the importance of parenthood mainly in women, in order to fulfil gender role expectations regarding parenthood. As a consequence, it can be expected that women will attribute higher importance to parenthood than men. Consistently, Newton et al. (1999) found out that women reported higher need for parenthood than man, although no differences were found in rejection of childfree lifestyle. Other studies (Abbey et al., 1991; Greil, Leitko, & Porter, 1988; Peterson, Newton, Rosen, & Skaggs, 2006; Slade et al., 2007;

Stöbel-Richter, Beutel, Finck, & Brähler, 2005) have also shown that the experience of childlessness is more devastating for women than for men, and it has been argued that this is mainly because parenthood is expected to be more central in women's life when compared to their partners. However, some authors have claimed that this is a stereotyped approach (Fisher, Baker, & Hammarberg, 2009) and argue that it should not be presumed that childless is less distressing for men than it is for women. Finally, differences in the impact of the importance of parenthood on emotional distress are expected. Indeed, regardless of similarities or differences in the importance of parenthood in men and women's lives, it has been reported that for women, but not for men, there was a significant pathway from infertility-related stress (which is affected by representations of the importance of parenthood) to general distress (Slade et al., 2007) suggesting that representations about the importance of parenthood could be associated with emotional distress for women but not for men.

A further understanding of the impact of contextual factors in the emotional distress in infertile couples could prove useful in a number of ways: Firstly, by explaining the variability of the emotional reaction in infertile couples. Secondly, it can help health professional to consider contextual factors when assessing couples' vulnerabilities to distress and to target their interventions to each couples needs. Finally, because it can shed some light in explaining gender differences in adjustment to infertility and ART.

The present study

A developmental ecological framework informs the present paper, recognizing infertility as a psychosocial phenomenon, affected by the ecological contexts of couples' lives (Bronfenbrenner, 1999). As a social constructed experience, infertility is thought to be affected by the contexts that shape expectations regarding the role of parenthood in one's life, thereby affecting the emotional impact of involuntary childlessness. Because social

expectations regarding parenthood are distinct for men and women, it is also expected that the contextual factors will affect each partner differently.

Specifically, the aim of the study was to explore the predictive value of contextual factors (SES and urban-rural residence) in explaining emotional distress, by indirectly affecting the importance of parenthood in couples' lives. The model is depicted in Figure 1.

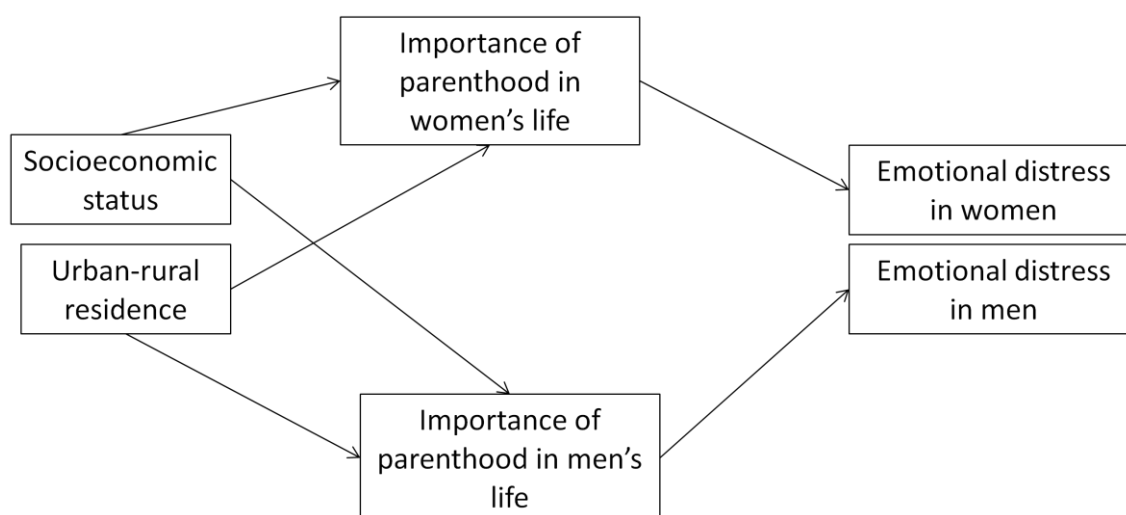


Fig. 1. Path model showing direct and indirect paths between social and demographic factors and emotional distress for female and male partner.

The following hypotheses were considered:

1. SES and rural residence will be associated with higher importance of parenthood in one's life (namely higher need for parenthood and higher rejection of childfree lifestyle);
2. Higher importance of parenthood in one's life will be associated with higher emotional distress;
3. There will be an indirect effect of SES and rural residence on emotional distress by affecting the importance of parenthood in couples' life;

4. Due to the gender differences in social expectations regarding parenthood, women's importance of parenthood will be more affected by contextual factors than their counterparts;
5. Women will report higher importance of parenthood in their lives and, consequently, will report higher emotional distress when compared with their partners.

Methods

Participants

Participants were 70 married or cohabiting couples entering an In Vitro Fertilization program from November 2006 to April 2007 and from November 2008 to April 2009. Sample characteristics are presented in Table 1.

Table 1. Sample Characteristics: Sociodemographic and Clinical variables (N= 70 couples)

Variables	Women (n=70)	Men (n=70)	<i>t-value</i> ^a
	Mean \pm SD or <i>n</i> (%)		
Age	32.51 \pm 3.91	34.77 \pm 4.50	-5.26***
Years of education	12.85 \pm 3.72	11.72 \pm 4.69	-2.64***
Years in relationship (range 2-19)	6.94 \pm 3.26		
Socioeconomic status (SES)			
Low	20 (28.6%)		
Medium	50 71.4%)		
High	0 (0%)		
Urban-rural residence			
Rural	13 (18.6%)		
SemiUrban	19 (27.1%)		
Urban	38 (54.3%)		
Duration of infertility (range 1-16)	4.78 \pm 2.65		
Previous treatments (range 0-5)	1.34 \pm 1.37		
* $p < .05$; ** $p < .01$; *** $p < .001$			
^a paired t test			

In general men were older than women and had lower education. Most couples belonged to the medium social class and lived in an urban area. Couples were trying to get pregnant for about 5 years and had already been submitted to one ART treatment on average.

Procedures

This study was approved by the Research Ethics Committees of Coimbra University Hospitals (CUH) and Vila Nova de Gaia Central Hospitals (VNGCH).

Participants were invited to participate in the study (as part of larger ongoing prospective study) during a routine appointment with the psychologist, in the beginning of their infertility treatment by ART, during hormonal stimulation phase (6th day). Inclusion criteria were age (18 years or older) and sufficient proficiency of Portuguese language to understand and complete the assessment protocol.

When recruiting participants, a full explanation of the research objectives, the participants' role and the researchers' obligations were given. If participants agreed to collaborate, they filled out a consent form.

Measures

Sociodemographic and clinical form: This form included sociodemographic data (age, length of relationship, years of education and occupation) and clinical information (number and type of previous treatments, length of infertility, cause of infertility). Socioeconomic status (SES) and urbanity were coded according to Portuguese standard procedures. Socioeconomic status (SES) was measured considering 3 categories (low, e.g. nonspecialized workers; medium, e.g. small business owners, high school teachers; and high, e.g. government or private companies administrators, lawyers), defined in terms of achieved education level and current occupation (Simões, 1994). Urban-rural residence was coded based on national established procedures for classifying locations (Instituto Nacional de Estatística, 2009)

Emotional distress: Emotional distress were assessed with the Portuguese version of Brief Symptom Inventory (BSI) (Derogatis, 1993; Portuguese version by Canavarro, 1999). In this 53-item scale, participants were asked to evaluate the frequency to which they experienced specific symptoms during the past week on a 5-point Likert scale ranging from 0 (*Never*) to 4 (*Very often*). Emotional distress was assessed using the Global Severity Index (GSI) of the BSI. In the present sample, GSI Cronbach *alpha* coefficients were .97 and .96 for women and men respectively.

Importance of parenthood: The importance of parenthood was assessed using two subscales of the Fertility Problem Inventory (FPI) (Newton et al., 1999, Portuguese version by Moura-Ramos, Gameiro, & Canavarro, 2008): Need for parenthood and Rejection of childfree lifestyle. The FPI is a 46-item scale, where participants were asked to rate how much they agree or disagree with fertility related concerns or beliefs, and responses are given in Likert-type format, ranging from 0 (*Strongly disagree*) to 6 (*Strongly agree*). Need for parenthood (NP) subscale assesses close identification with role of parent and parenthood perceived as primary or essential goal in life. (eg. “Pregnancy and childbirth are the two most important events in a couple’s relationship”, “I will do just about anything to have a child”). Rejection of childfree lifestyle (RCL) captures negative views of childfree lifestyle or status quo, future satisfaction or happiness dependent on having a child (e.g. “Having a child is not necessary for my happiness”; “Couples without a child are just as happy as those with children”, all coded inversely). These subscales were used to assess the importance of parenthood, because they express the importance of parenthood and concerns about life without children. The FPI demonstrates good discriminant and convergent validity (Newton et al., 1999). In the present sample, Cronbach *alpha* coefficients for these subscales were .78 and .76 for NP and .77 and .72 for RCL for women and men respectively.

Data analysis

Descriptive statistics and group comparisons were performed using SPSS v. 18. To examine the relation between contextual factors (namely SES and urbanity) and emotional distress, a path analysis examining direct and indirect effects was conducted using AMOS (v. 18.0) structural modelling with maximum likelihood estimation method.

To evaluate overall model fit, several fit indices were used: The Chi-Square goodness-of-fit statistic, the comparative fit index (CFI), the standardized root-mean-square residual (SRMR) and the root mean square error of approximation (RMSEA). A model is considered to have very good fit if the Chi-Square statistic is nonsignificant, the CFI is greater than 0.95, the SRMR is below .08 and the RMSEA is below 0.06 (Hu & Bentler, 1998). Hu and Bentler recommended the use of a two index presentation strategy in the maximum likelihood approach, namely the SRMR, supplemented by either indices like CFI or RMSEA, that are recommended when sample size is <200.

To account for the nonindependence of partners' scores, data analyses were performed using the couple as a unit (Kenny, Kashy, & Cook, 2006). The database was restructured in order to consider each couple as the subject of the analysis and each partner score was a different variable.

To test for the significance of the indirect effects, bootstrap procedures were used following recent recommendations (Cheung, 2009; Hayes, 2009; MacKinnon & Fairchild, 2009; MacKinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002), using 2000 samples. Bootstrap methods were used because 1) they allow for the estimation of the statistical significance of the indirect effects and for the determination of the confidence intervals for the point estimate (Mallinckrodt, Abraham, Wei, & Russell, 2006) and 2) considering that indirect effects are seldom based on a normal distribution, they capture the nonnormal shape of the mediated-effect sampling distribution (MacKinnon et al., 2004).

According to Preacher and Hayes (2004), indirect effects are significant when there is no zero value in the 95% Bias-corrected Bootstrap Confidence Interval.

Results

Descriptive results

Table 2 describes mean scores of men and women in need for parenthood, rejection of childfree lifestyle and global severity index and correlations among the study variables.

Table 2 Means and standard deviations, mean differences and correlations among variables in the model

	Mean±SD	1	2	3	4	5	6	7
1.SES	-	-						
2.Urban-rural residence	-	-.18	-					
3.Need for parenthood W	42.14±8.24	-.30*	.16	-				
4.Need for parenthood M	41.30±7.33	-.23	.25*	.59***	-			
5 Rejection of childfree lifestyle W	32.01±7.33	-.28*	.38**	.68***	.57***	-		
6.Rejection of childfree lifestyle M	33.14±7.19	-.35*	.13	.42***	.47***	.62***	-	
7.Global severity index W	.76±.57	-.09	.07	.44***	.41**	.37**	.25*	-
8.Global severity index M	.57±.44	-.17	.09	.37**	.45***	.17	.14	.56***

*p<0.05; **p<0.01; ***p<0.001

Note: SES was dummy coded: 0=Low SES, 1=Medium SES; Urban-rural residence was dummy coded: 0-Urban, 1- Rural/Suburban.
W=Female partner; M= Male partner

Significant differences across partners were found regarding global severity index ($t=5.058, p<0.001$), with women reporting higher scores than their partners. SES and urban-rural residence were not related to the global severity index. SES was moderately associated with need for parenthood for women and rejection of childfree lifestyle for both men and women, indicating that medium SES was associated with lower NP for women and low lower RCL for both men and women. Urban-rural residence was positively associated with need for parenthood for men and rejection of childfree lifestyle for women: rural residence is related to higher RCL for women and higher NP for men. Need for parenthood and rejection of childfree lifestyle were positively associated with the global severity index for women but not for men.

Path analysis

Two path analysis models were built to examine indirect effects of SES and urban-rural residence in emotional distress by affecting the rejection of childfree lifestyle and the need for parenthood. Although a unique model could have been built to test for the simultaneous effects, we chose to test them separately for a better understanding of the *process* of these indirect effects.

Model 1 - Need for parenthood as the intervening variable

Figure 2 depicts the final model 1 with the standardized estimates, covariances and regression coefficients (R^2 s) of the outcome variables.

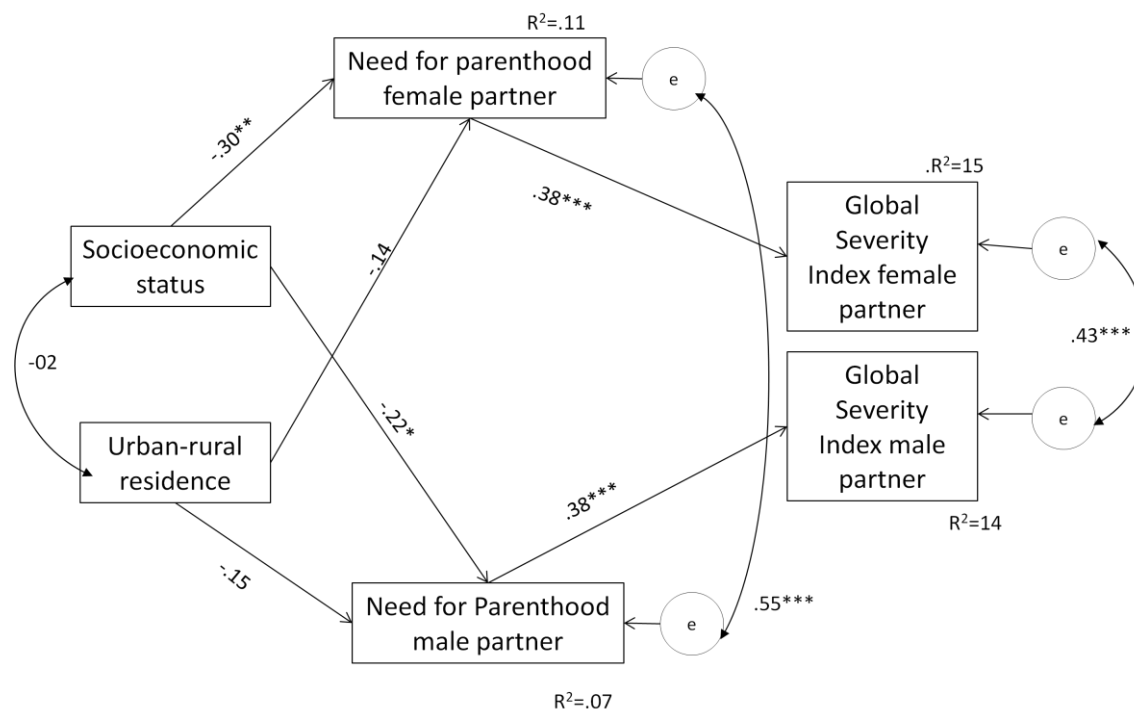


Figure 2. Path model testing the indirect effect of the relation between SES and rural-urban residence on emotional distress [Model fit indices: $\chi^2(6) = 7.744, p = .256$; CFI = .977; RMSEA = .065; SRMR = .065].

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

The Chi-Square value of the model tested was nonsignificant $\chi^2(6) = 7.744, p = .256$, suggesting a good fit of the measurement model to the theoretical model. Additional fit indices confirmed the model very good fit [CFI = .977; RMSEA = .065; SRMR = .065].

According to Model 1, SES, but not urban-rural residence, significantly affected the need for parenthood in men and women. More specifically, in both the male and female partners, belonging to the lower SES increased significantly the need for parenthood. The global severity index is significantly affected by the need for parenthood in both men and women paths.

Model 2 - Rejection of childfree lifestyle as the intervening variable

Figure 3 depicts the final model 2 with the standardized estimates, covariances and regression coefficients (R^2 's) of the outcome variables.

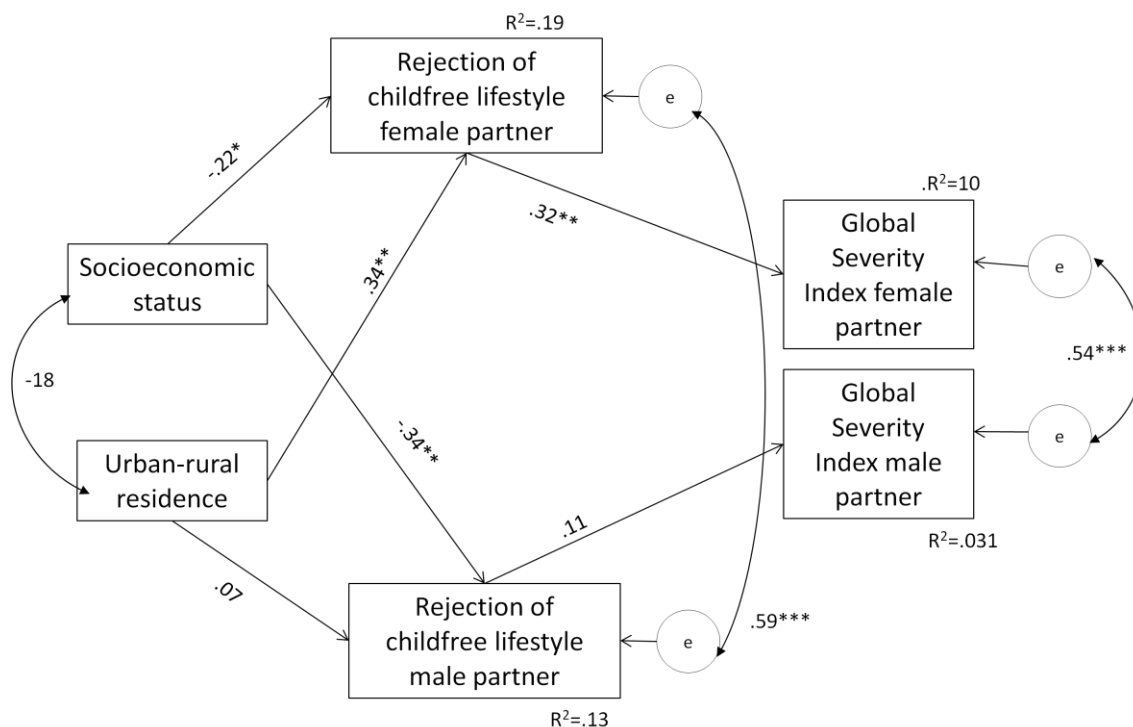


Figure 3. Path model testing the indirect effect of the relation between SES and rural-urban residence on emotional distress [Model fit indices: $\chi^2(6) = 3.662, p = .722$; CFI = 1.000; RMSEA = .000; SRMR = .045].

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

The Chi-Square value of the model tested was nonsignificant [$\chi^2(6) = 3.662, p = .722$], suggesting a good fit of the measurement model to the theoretical model. Additional fit indices confirmed the model very good fit [CFI = 1.000; RMSEA = .000; SRMR = .045]. According to Model 2, SES significantly affected the RCL for both men and women, while urban-rural residence affected only RCL for women. Lower SES, and rural residence for women, was associated with higher rejection of childfree lifestyle. The global severity index was affected by the rejection of childfree lifestyle, but just for women. Although no gender differences were found in RCL, for men it was not associated with emotional distress.

Indirect effects

Indirect effects

To assess whether indirect effects were statistically significant, the bias-corrected (BC) bootstrap 95% confidence intervals (CIs) procedure was used and results are presented in Table 3.

Table 3. Specific standardized indirect effects and their respective confidence intervals for the path models for couple partners

		Indirect effects	Bias-corrected 95% CI
Model 1. Need for parenthood			
Female partner	SES→NP →Global severity index	-.115 ^a	-.229; -.033
	Urban→ NP →Global severity index	-.055	-.157; .014
Male partner	SES→ NP →Global severity index	-.083 ^a	-.197; -.033
	Urban→ NP →Global severity index	-.057	-.143; .015
Model 2. Rejection of childfree lifestyle			
Female partner	SES→RCL→Global severity index	-.070 ^a	-.163; -.014
	Urban→ RCL →Global severity index	.109 ^a	.043; .202
Male partner	SES→ RCL →Global severity index	-.037	-.129; .015
	Urban→ RCL →Global Severity Index	.008	-.007; .063
<i>Note.</i> ^a Significant indirect effect (i.e., confidence interval (CI) does not include zero).			

Regarding Model 1, significant indirect effects were found (i.e., none of the estimated 95% CIs contained the value of zero) between SES and emotional distress in both couple partners. Belonging to the lower SES group affected emotional distress not directly but by increasing the need for parenthood in both couple partners, which increased the global severity index.

As reported in Table 3, significant indirect effects were also found in Model 2, in the association between SES and urban-rural residence but just for the female partner. The effect of the urban-rural residence and the socioeconomic status on women's emotional distress was indirect, by affecting their rejection of childfree lifestyle. Specifically, for infertile women,

belonging to the lower SES group and living in a rural area affected emotional distress not directly but by increasing the rejection of childfree lifestyle, which increased the global severity index.

Discussion

Our study presented two path analysis models using structural equation modelling that aimed to examine the indirect effect of contextual factors, namely urban-rural residence and socioeconomic status, in emotional distress in men and women recurring to ART.

Main findings of this study were twofold: Contextual factors do not affect directly emotional distress but indirectly, by shaping the way the infertility and Assisted Reproductive Technology are experienced by men and women; and indirect effects, although found in both men and women, are less predictive of men's emotional distress when compared to women. These results are of fundamental importance in light of the constant finding in the infertility literature that women are more affected by infertility and ART than men (Abbey et al., 1991; Benyamini, Gozlan, & Kokia, 2009; Beutel et al., 1999; Greil et al., 1988; Hjelmstedt et al., 1999; Holter, Anderheim, Bergh, & Moller, 2006). Indeed, although several studies have reported marked gender based differences in the experience of infertility, few have contributed empirically to explain why women seem to be more negatively affected than men, and, in general, have suggested that differences are explained by the increased value women attribute to parenthood, as found by Stöbel-Richter et al. (2005). Nonetheless, our results showed that there are no gender differences in the value attributed to parenthood, but in the way that the latter affects emotional distress in men and women experiencing involuntary childlessness.

To test our hypotheses, we developed two models, testing the role of the importance of parenthood (i.e. one for parental need and another for rejection of a childfree lifestyle) in explaining the association between SES and urban-rural residence and emotional distress of

infertile couples recurring to ART. The empirical models revealed a very good fit to the theoretical model, suggesting that this contextual approach was a valid framework to emotional distress in infertility and ART experience.

Our first two hypotheses focused on establishing the direct association of the predictors and the outcomes to the intervening variable. Our first hypothesis was confirmed: In general, lower SES and living in a rural area were associated with higher rejection of childfree lifestyle and higher need for parenthood. In general, results are consistent with the view of infertility as a social constructed experience (Greil, 1997), where contextual factors may affect the infertility and ART experience by shaping the importance that individual attribute to the centrality of parenthood in their lives.

Our second hypothesis was also partially confirmed: The need for parenthood was associated with higher emotional distress for both men and women but rejection of childfree lifestyle only affected emotional distress in women. This result is partially consistent with the results found by Newton et al (1999), which showed that rejection of a childfree lifestyle and need for parenthood were associated with depression and anxiety for infertile men and women, although in general stronger associations were found for women. However, the lack of association between the rejection of childfree lifestyle and emotional distress in men was a surprising result suggesting that only for women failure in achieving parenthood threatens wellbeing, increasing emotional distress. Indeed, although for women, envisioning themselves without children in the future is somewhat disturbing, for men probably future life satisfaction does not depend as strongly on having children, as suggested by Abbey et al. (1991). Therefore, for men higher rejection of childfree lifestyle does not increase emotional distress (explaining thereby the nonexistence of indirect effects for men in this subscale).

Indirect effects found confirmed partially our hypotheses. Our results clearly demonstrate that contextual factors like SES and urban-rural residence affected emotional distress not

directly (as shown in Table 2) but by affecting the importance of parenthood in men and women's life (as stated in the Hypothesis 3). Therefore, our results go beyond previous research that suggested that low income and low education have a direct negative impact in emotional distress in infertility (Beutel et al., 1999; Drosdzol & Skrzypulec, 2008; McQuillan et al., 2003), by demonstrating their indirect effect through influencing the importance of achieving parenthood. However, the process of this effect was different for men and women and depended upon the intervening variable.

Because rural contexts are prone to more traditionalist conceptions of life and parenthood (Aycicegi-Dinn & Kagitcibasi, 2010), higher social expectations and higher social pressure to parenthood are expected. Therefore, people from rural contexts may report a stronger negative impact of the infertility experience in their lives and therefore higher emotional distress. Noteworthy, urban-rural residence only affected the women's rejection of childfree lifestyle. Thus, for women who live in rural areas, who may have higher expectations regarding the motherhood role than women living in urban areas, not having children results in the perception of lower status or less future satisfaction or happiness in life. This result also confirmed our fourth hypothesis.

Additionally, results suggesting that low SES is associated with higher need for parenthood and consequently higher emotional distress may be explained by the difficulties that couples may experience in envisioning themselves in the future without other valued goals beyond having children, as parenthood is viewed as one important life task that promotes in individuals' and couples development (Goldberg, 1988). Research have suggested that higher education allows for more easiness in redefining goals for individuals lives when parenthood is not achieved, namely by investing in a professional career (Van Balen & Inhorn, 2002). Therefore, couples with lower education and lower occupational commitment may have less alternative goals to invest other than children and parenthood,

therefore reporting a stronger impact of the infertility experience and higher emotional distress by being childlessness.

Strengths and limitations

A major contribution from this study was the test of indirect effects explaining emotional distress in infertile couples recurring to ART. Although establishing relationships between variables is important, knowing the *process* by which some variables (the context) influences other variables (individuals' adjustment) is of major scientific interest (Card, Little, & Bovaird, 2007). More specifically, it highlights the importance of health professionals taking into account that the infertility experience is affected by the couples context in their clinical practices.

The use of a dyadic design that explores both men and women experience while controlling for the nonindependence of couples' scores (Kenny et al., 2006) was an important contribution. Indeed, because gender differences in the infertility experience are expected and widely described (Abbey et al., 1991; Anderson, Sharpe, Rattray, & Irvine, 2003; Bayley, Slade, & Lashen, 2009; Greil et al., 1988; Hjelmstedt et al., 1999), testing the model in both men and women allowed for the identification of different patterns in the prediction of adjustment to ART.

Another contribution was the exploration of sociodemographic factors; albeit they have been widely used in research regarding emotional distress in the literature, they have been scarcely tested in an empirical model; therefore its impact was not clear.

Besides the aforementioned contributions, several limitations of the present study are worth noting: its cross-sectional nature does not allow the establishment of a causal model or the prediction of long term adjustment, accounting just for the explanation of the variability on the outcome measures. Applying this model to the long term adjustment in longitudinal studies would be helpful to further understand the impact of the factors studied in lifelong

approach. Additionally, the present model was parsimonious, testing a limited number of predictors of emotional distress. In future research, it would be interesting to integrate these results in a more comprehensive model in order to test an explicative model of adjustment to infertility and ART. Finally, these results concern emotional distress in couples entering and ART program, which may be described as an acute stress period in infertile couples lives. Therefore, although variables studied are not specifically related to the treatment, their impact in other stages of the infertility experience may be somewhat different.

Implications for practice

Several implications for practice are also noteworthy. The identification of predictors of emotional distress is an important contribution because it allows health care providers to direct their attention to more specific characteristics of infertile couples presenting for ART and to target their interventions in order to meet specific needs of each couple (and each men and women). Indeed, when couples have difficulties in envisioning themselves in the future without children and believe that parenthood is the major goal of their life, they tend to enter in an ART program more vulnerable to emotional distress. Early detection of these difficulties can be important for professionals to help couples dealing with this distress.

It should be taken into account that cultural and social backgrounds may affect couples not only in more practical issues such as the financial aspects of treatment and the communication with the clinical staff, but also coming the way couples experience their fertility problems. Although this study focused on couples who were starting their treatment, results suggest that couples from a less favourable background may need increased help in reducing distress during treatments but also when faced with ending treatment without achieving pregnancy, in order to be able to define new life goals and to accept a childfree lifestyle.

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