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## Testing a New Group Intervention for Couples Seeking Fertility Treatment: Acceptability and Proof of Concept

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### ABSTRACT

This study tested the acceptability and preliminary efficacy of a novel group intervention for couples seeking fertility treatment. Twenty-nine couples completed psychological, relational, and sexual outcome measures pre- and post-intervention. Repeated-measures ANOVAs revealed significant reductions in terms of depressive symptoms, rejection of childfree lifestyle, and stress related to the need for parenthood. The results also revealed improvements in marital benefits and fertility-related emotional and relational quality of life. Couples' high participation rates and reported treatment satisfaction indicate adequate acceptability. These results support the preliminary success of the intervention in reducing the psychological and relational burden for couples undergoing fertility treatment.

Infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (Zegers-Houchschild et al., 2009). In Canada, the prevalence of infertility ranges from 11.5% to 15.7% (Bushnik, Cook, Yuzpe, Tough, & Collins, 2012). Infertility, often described as a life crisis (Faramarzi et al., 2013), can represent a threat to individuals' psychological, relational, and social stability (Yazdani et al., 2017). A substantial body of research shows that fertility treatment is associated with anxiety and depression, relationship distress, and a reduction in quality of life (Chiaffarino et al., 2011; Drosdzol & Skrzypulec, 2008, 2009; Montazeri, 2007; Mousavi, Masoumi, Keramat, Pooralajal, & Shobeiri, 2013; Verhaak, Lintsen, Evers, & Braat, 2010).

Psychosocial interventions have been developed to address the psychological and relational impact of infertility and its treatment. Previous studies point to the efficacy of these interventions, provided in either an individual, couple, or group format, in reducing distress (psychiatric symptoms and relationship distress), and improving the quality of life (QoL) of infertile individuals (for reviews, see Boivin, 2003; de Liz & Strauss, 2005; Frederiksen, Farver-Vestergaard, Skovgård, Ingerslev, & Zachariae, 2015). Group-based interventions however, have been associated with more prominent results, particularly with respect to psychological outcomes (Boivin, 2003; Frederiksen et al., 2015). Randomized controlled trials have shown that group interventions using cognitive behavioral therapy (CBT) or mindfulness-based (MB) approaches significantly reduce symptoms of anxiety (Chan, Ng, Chan, & Chan, 2006; Chan et al., 2012; Domar et al., 2000; Lee, 2003), depression (Faramarzi et al., 2008), and infertility-related stress (Faramarzi et al., 2013) in women undergoing fertility treatment. MB group interventions have also been found to generate significant improvements in relationship satisfaction, overall mental health (Abedi Shargh et al., 2015), and fertility-related QoL (Li, Long, Liu, He, & Li, 2016). Several studies have also

highlighted other benefits of group interventions, including the common experience of group members, the exchange with other individuals, and the reduction in feelings of isolation (Lentner & Glazer, 1991; Yalom & Leszcz, 2005). Compared to individual interventions, group therapy is also both time and cost efficient, making it a more practical and useful method in addressing the multifaceted issues encountered by infertile individuals (Covington & Burns, 2006).

Despite the evidence pointing to the efficacy of group interventions in the context of infertility, particularly CBT groups (Frederiksen et al., 2015; Ying, Wu, & Loke, 2016), Hämmerli et al. (2009) have identified, within their meta-analysis, important limitations in the studies published to date. Most notably, the majority of group interventions have involved women seeking In Vitro Fertilization (IVF) exclusively, and have failed to include their partners. However, partners' involvement in interventions is crucial to address the psychological needs of men as well as women, and to investigate how partners might help each other cope with the stress of infertility (Sexton, Byrd, O'Donohue, & Jacobs, 2010). Involving both partners in group interventions is also beneficial in promoting partnership and increasing their mutual benefit (Hi-Kwan Luk & Loke, 2016). This is especially important since the stress of not being able to conceive affects women and men, and the couple as a unit (Luk & Loke, 2015; Ying, Wu, & Loke, 2015).

Most group interventions developed for individuals with fertility problems have also failed to address relationship and sexual issues related to infertility. Moreover, only a few studies have examined the effect of psychological interventions for infertility on relationship outcomes (for reviews, see; Hämmerli et al., 2009; Ying et al., 2016). This is problematic as infertility has an impact on the couple, beyond its individual members (Sauvé, Péloquin, & Brassard, 2018), and an increasing number of studies have documented its negative effects on couples' sexuality (for reviews, see Coëffin-Driol & Giami, 2004; Purcell-Lévesque, Brassard, Carranza-Mamane, & Péloquin, 2018; Wischmann, 2010). The need to include both partners and to incorporate relational and sexual components within interventions for infertile couples is therefore highly justified. To our knowledge, no study has assessed the efficacy of a group-based intervention using the couple as a unit of analysis, hence overlooking the interconnectedness of partners' experience in the context of infertility and its treatment.

Lastly, studies examining interventions involving individuals undergoing fertility treatment have failed to integrate measures that are specific to infertility. Instead, general measures of adjustment (e.g., Beck Depression Inventory, State-Trait Anxiety Inventory, Dyadic Adjustment Scale) have often been used. Although these measures are informative, they are not necessarily fully sensitive to the subtle effects of infertility and its treatment on psychological and relationship adjustment. Indeed, the effects of interventions with infertile individuals might be difficult to capture entirely through general questionnaires (Boivin, 2003). In an effort to address the above-mentioned limitations and to incorporate previous recommendations pertaining to psychological group interventions in the context of infertility, Péloquin and Brassard (2012) developed a new psychoeducational and support group intervention, rooted in the CBT model. This intervention was developed in French for couples seeking fertility treatment in the province of Quebec, Canada, where mental health services for individuals with infertility are not easily accessible in all fertility centers. It has been widely recommended that psychological interventions be incorporated into routine practice for couples with infertility problems (Chow, Cheung, & Cheung, 2016; Yazdani et al., 2017). Hence, it is particularly important to invest efforts towards developing and assessing the efficacy of psychological interventions that address the specific needs of couples in the midst of infertility procedures.

Accordingly, the present study aimed to assess the initial acceptability, and potential efficacy of a novel manualized psychoeducational and support group for both members of couples seeking fertility treatment. In an effort to add a valuable contribution to previous studies, the intervention was designed to involve both partners (regardless of their fertility treatment) and target couples as dyads in a partnership. This study followed the recommendations put forth by the Obesity-

Related Behavioral Intervention Trials (ORBIT) model (Czajkowski et al., 2015). As indicated for early intervention testing, we conducted a proof-of-concept study (Phase IIA) using a quasi-experimental, within-subject design. The goal of this phase was to test the ability of the treatment package to produce a clinically significant improvement (Czajkowski et al., 2015) in general and infertility-specific measures of psychological and relational functioning. Sexual variables were also included as exploratory outcomes. The acceptability (adherence and satisfaction) of this novel intervention was also assessed.

It was hypothesized that following the intervention, partners would report significant improvements from pre- to post-intervention in (1) psychological outcomes (depression symptoms and anxiety, infertility-related stress, and infertility-related QoL); and (2) relationship outcomes (relationship benefits related to infertility, infertility-related relationship and sexual concerns, infertility-related relational QoL, and global relationship and sexual satisfaction). Due to the small sample size, statistically significant effects were examined, although we primarily sought clinical, rather than statistical benefit (Czajkowski et al., 2015). Therefore, the magnitude of effect sizes ( $\eta^2_p$ ; small = 0.01; medium = 0.06; large = 0.14; Cohen, 1988) was considered to determine whether the intervention achieved a clinically significant signal on the specified outcomes. Lastly, the intervention was expected to demonstrate adequate preliminary acceptability, as assessed by attrition rate, attendance, and participants' perceived helpfulness and satisfaction with the group.

## Methods

### Participants

Participants included 29 French-Canadian mixed-sex couples who were undergoing treatment at a fertility center. Women's mean age was 32.52 years ( $SD = 4.92$ ; range = 22–44) and men's mean age was 34.41 years ( $SD = 4.08$ ; range = 27–41). On average, partners had been involved in their relationship for 5.69 years ( $SD = 3.43$ ; range = 1–11) and had been cohabiting for 5.45 years ( $SD = 2.76$ ; range = 0–10). The nature of the fertility problem was due to female factors (41.4%), male factors (17.2%), combined male and female factors (6.9%), and unexplained reasons (34.5%). Less than a third (31.0%) of participants had been undergoing fertility treatment for less than one year, 62.1% for one to three years, and 6.9% for more than three years. Participants sought different types of treatment: fertility drugs only (20.69%), insemination (20.69%), or IVF (31.03%), and 27.59% did not mention their treatment or had not begun treatment yet.

### Procedure

Couples were recruited from four fertility clinics in the province of Quebec, Canada, as well as through Facebook and Canadian patient associations, to take part in the group intervention. Inclusion criteria included being aged 18 and over and receiving services at a fertility center at the time. Individuals receiving other types of psychotherapy or taking antidepressant drugs were excluded. For this preliminary study, we sought a fairly homogenous sample of couples. As such, same-sex couples and single women seeking fertility treatment without a partner were also deemed ineligible to participate in the study, as they may not have necessarily been infertile and their experiences may differ from heterosexual infertile couples (e.g., issues related to stigma, no medical infertility).

A research assistant conducted an initial screening phone interview with each couple interested in participating in the group intervention to ensure that they met inclusion criteria and to describe the procedures involved in the group and the research component. Both partners completed the consent form and the pre-intervention questionnaires individually via an online secure web platform one week before the beginning of the group. Participants took part in 6 group

sessions, and completed post-intervention questionnaires via the online platform immediately following the group cessation. A research assistant observed half of the group sessions as an auditor to ensure that the group leaders were following the treatment manual. This research was approved by the researchers' university ethics board and by the ethics board of the fertility clinics where some of the participants were recruited.

### **Group intervention**

The group intervention has been designed based on a cognitive-behavioral approach and aimed to: 1) validate the emotional experience of participants; 2) provide information on the medical and psychological facets of infertility and its treatment; and 3) provide tools to help individuals manage emotions and challenges related to infertility and to the different treatment modalities. The intervention included six 90-minute sessions offered over a period of 10 weeks (one session every two weeks). Bimonthly sessions were chosen to take into consideration the time-consuming and rigorous demands of fertility treatment (multiple medical appointments and procedures) and to maximize participants' attendance.

Each session focused on a specific theme, including losses, gender differences in the emotional reactions to infertility, interpersonal relationships, feelings of loss of control, partnership with the medical team, stress and coping, decision making, gaining knowledge on alternative ways to start a family (gamete or embryo donation, surrogacy, adoption), the impact of infertility on the relationship and sexuality, and coming to terms with the possibility of a life without children. The themes covered the most salient issues raised in the context of infertility (Covington & Burns, 2006). Part of each session was also dedicated to sharing experiences related to the specific themes discussed in session. Additional readings associated with the topics evoked were provided to participants at the end of each session. The intervention was offered free of charge and was co-led by a psychologist and a nurse, both specialized in the domain of infertility. Both members of the couple were invited to participate. It has been suggested that the optimal number of group members should be 8 to 12 individuals (Yalom & Leszcz, 2005; Yazdani et al., 2017). In smaller groups, which generally lack in cohesiveness, therapists often find themselves engaged in individual therapy within the group, while in larger groups, participants are not given adequate time to share their experiences or ask questions (Yalom & Leszcz, 2005). Therefore, each group consisted of a maximum of six couples to allow sufficient time for participants to express themselves with respect to the themes covered in session. The themes, as well as the core content covered during each session, are detailed in [Table 1](#).

### **Therapists**

The groups were offered in four different cities (Montreal, Laval, Quebec, Sherbrooke). Five psychotherapists were trained to use the standardized manual. Two of them were psychologists specialized in infertility and three were psychology pre-doctoral interns who were supervised by the authors of the manual. Four members of the medical health team (three nurses and one resident in gynecology) also underwent training to familiarize themselves with the interventions, and co-lead the group sessions with a psychotherapist.

### **Measures**

Demographic information, details about participants' current relationship (e.g., duration of the relationship, number of children), and their medical history were obtained.

**Table 1.** Session content of the psychoeducational and support group intervention for couples undergoing fertility treatment.

Session themes	Objectives	Core content
Session one : Introduction	<ul style="list-style-type: none"> <li>• Getting acquainted with group members</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation of the format and rules of the group</li> </ul>
Session two: The roller coaster of emotions	<ul style="list-style-type: none"> <li>• Name and normalize different emotions related to infertility problem</li> </ul>	<ul style="list-style-type: none"> <li>• Prevalence and causes of infertility</li> <li>• Common reactions to the experience of infertility and its treatments / gender differences</li> </ul>
Session three: Fertility treatment and fertility-stress	<ul style="list-style-type: none"> <li>• Learn about different fertility treatments and their process</li> </ul>	<ul style="list-style-type: none"> <li>• Medical evaluation process and different fertility treatments</li> <li>• Possible sources of stress related to difficulty conceiving and fertility treatments</li> </ul>
Session four: Coping strategies to manage the stress	<ul style="list-style-type: none"> <li>• Identify sources of stress and manage stress effectively</li> </ul>	<ul style="list-style-type: none"> <li>• Psychoeducation on infertility and stress</li> <li>• Tools to manage stress</li> </ul>
Session five: Taking care of our couple and our sexuality	<ul style="list-style-type: none"> <li>• Promote better relationship support</li> </ul>	<ul style="list-style-type: none"> <li>• Gender differences in reactions to infertility</li> <li>• Communication and sexuality within the couple</li> </ul>
Session 6: Family conception, loss and alternatives options	<ul style="list-style-type: none"> <li>• Open the dialog on alternative options</li> </ul>	<ul style="list-style-type: none"> <li>• Personal definition of the family, dealing with the loss</li> <li>• Conclusion</li> </ul>

**Infertility-related quality of life**

The Fertility Quality of Life tool (FertiQoL; Boivin, Takefman, & Braverman, 2011) includes 36 items that assess the QoL related to infertility problems (24 core items, 10 treatment items, 2 global and physical health items). The scale has good internal consistency ( $\alpha$  varied from .72 to .92; Boivin et al., 2011). In this study, only the core items were used because participants were not all undergoing active treatment at the time of the study (i.e., in between treatment cycles). The core items reflect QoL in the emotional (e.g. Do your fertility problems cause feelings of jealousy and resentment?), mind-body (i.e., cognitive and physical; e.g. Are your attention and concentration impaired by thoughts of infertility?), relational (e.g. Do you find it difficult to talk to your partner about your feelings related to infertility?), and social domains in relation to the fertility problem (e.g. Do you feel uncomfortable attending social situations like holidays and celebrations because of your fertility problems?). Participants are asked to rate to what extent each item represents their experience using a 5-point Likert scale ranging from *very poor* (1) to *very good* (5). The total score for each subscale ranges from 0 to 100, with higher scores representing better QoL in each respective domain. In the present study, the internal consistency for the four domains varied from .67 to .89.

**Infertility-related stress**

The Fertility Problem Inventory (FPI; Newton, Sherrard, & Glavac, 1999) is a 46-item measure of perceived infertility-related stress on five different areas: social, sexual, and relationship concerns, need for parenthood, and rejection of a childfree lifestyle. Each item is evaluated on a 6-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (6). The total score for each subscale is calculated by summing its respective items. The scores range from 46 to 276, with a higher score representing a higher level of infertility-related stress. The subscales previously demonstrated good internal consistency ( $\alpha$  ranging from .77 to .87; Newton et al., 1999). In the current study, alpha coefficients varied from .76 to .85.

### **Anxiety and depression**

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was originally developed to assess the level of anxiety and depression of patients in hospitals. To avoid the possible effect of 'noise' due to somatic disorders on participants' scores, all symptoms of anxiety or depression that were also related to physical disorders, such as dizziness, headaches, insomnia, anergia and fatigue, were excluded. Symptoms concerning serious mental disorders were also excluded. Hence, the scale includes 14 items; seven items assess anxiety symptoms and seven items assess depression symptoms. Good internal consistency has been demonstrated for both subscales ( $\alpha$  varied from .68 to .93 for anxiety and from .67 to .90 for depression; Bjelland, Dahl, Haug, & Neckelmann, 2002). Items are rated on 4-point Likert-type scale. The two total scores (ranging from 0 to 21) are calculated using a sum of the two subscales. A score of eight and above is considered clinically significant. This clinical cutoff revealed a specificity and a sensitivity of 80% for anxiety and depression (Bjelland et al., 2002). The subscales also demonstrated good internal consistency in the current sample, with an alpha coefficient of .80 for anxiety, and .83 for depression.

### **Relationship satisfaction**

The DAS-4 (Sabourin, Valois, & Lussier, 2005) is a short version of the original 32-item Dyadic Adjustment Scale (DAS; Spanier, 1976). It includes four items that evaluate relationship satisfaction. The scale has good internal consistency ( $\alpha = .88$ ). Items are scored on a six or seven-point scales. The total score (ranging from 0 to 21) is calculated using the sum of the items, with a high score indicating a higher relationship satisfaction. In the present study, the scale demonstrated good internal consistency ( $\alpha = .76$ ).

### **Marital benefits**

The Marital Benefits Scale (Schmidt, Tjornhoj-Thomsen, Boivin, & Nyboe Andersen, 2005) includes two items measuring the positive effects of infertility on the relationship ("Childlessness has brought us closer together" and "Childlessness has strengthened our relationship"). Items are rated on a five-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Ratings are summed to provide a total score, ranging from 2 to 10. A strong correlation between the two items was observed in the original study ( $r = .83$ ; Schmidt et al., 2005). In our study, the two items demonstrated excellent internal consistency ( $\alpha = .93$ ).

### **Sexual satisfaction**

The Global Measure of Sexual Satisfaction (GMSEX; Lawrance, Byers, & Cohen, 2011) assesses overall sexual satisfaction. Respondents rate their sexual relationships with their partner based on five seven-point dimensions: *Good-Bad*, *Pleasant-Unpleasant*, *Positive-Negative*, *Satisfying-Unsatisfying*, *Valuable-Worthless*. The scale is scored additively, with scores ranging from 5 to 35. Higher scores are indicative of greater sexual satisfaction. This measure has been shown to have high internal consistency ( $\alpha = .90$  to  $.96$ ), which is comparable to results obtained for the present study ( $\alpha = .89$ ).

### **Intervention satisfaction**

After the intervention had ended, participants were asked to rate their satisfaction with the group, with respect to the content discussed, the location, the schedule, the material used, and the group facilitators, using a five-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5).

Participants also shared the components of the intervention that they considered most and least helpful, through open-ended questions.

## Results

### Preliminary analyses

Prior to conducting the main analyses, data were screened for missing values and to assess normality. Due to its ability to maximize power (Widaman, 2006), single imputation (using the expectation-maximization algorithm in SPSS 24.0 software) was used to replace missing data (less than 1% of the data set, missing at random). Three variables were subjected to a non-linear transformation to correct for a non-normal distribution: global relationship satisfaction, infertility-related emotional QoL, and marital benefits were transformed using a reflection and a log transformation. All other variables had an acceptable normality index (skew and kurtosis indices < 1). Means and standard deviations for all study variables pre- and post-intervention are presented in Table 2.

Preliminary analyses were conducted to identify potential control variables among the demographic and medical history (pre-intervention variables). Correlations, conducted separately for men and women, showed that women’s age ( $r = -.38$ ) and men’s age ( $r = -.41$ ) were negatively related to women’s stress related to the need for parenthood. Fertility treatment duration was also correlated with lower levels of relationship satisfaction ( $r = -.42$ ), relationship benefits ( $r = -.49$ ), infertility-related sexual concerns ( $r = -.42$ ), and infertility-related relationship concerns ( $r = .38$ ), for women. Accordingly, both partners’ age and treatment duration were controlled for in the main analyses. A (2) X 4 repeated-measures ANOVA, with gender as a repeated measure for the dyad, revealed that the cause of infertility (male, female, mixed, unknown) was associated with relationship satisfaction ( $F(3,25) = 3.74, p = .024, \eta^2_p = .31$ ).

A Tukey post-hoc test showed that relationship satisfaction was higher in couples where the infertility was due to female factors ( $M = 17.92; ET = .77$ ) compared to the three other causes (male factors:  $M = 13.90; ET = 1.17$ ; mixed factors:  $M = 17.75; ET = 1.86$ ; unknown cause:  $M = 15.30; ET = .83$ ). Accordingly, this variable was dichotomized (female versus all other causes) and controlled for when examining relationship satisfaction in the main analyses.

**Table 2.** Means and standard deviations for outcomes variables by assessment time-points ( $N = 29$  couples).

Measure	Pre-intervention				Post-intervention			
	Women		Men		Women		Men	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Anxiety	9.23	3.94	5.93	3.81	8.24	3.83	5.43	3.66
Depression	6.58	3.99	4.48	3.49	5.37	2.78	3.11	3.80
Relationship Satisfaction	16.34	3.14	15.69	3.55	16.83	2.78	15.79	3.53
Marital Benefits	3.88	1.13	3.41	1.07	4.12	0.98	3.93	0.80
Sexual Satisfaction	24.38	5.15	26.95	5.94	24.90	5.13	25.56	6.42
Social concerns	37.60	8.55	27.95	10.14	38.10	8.33	27.93	9.08
Sexual concerns	27.52	6.98	20.45	7.84	27.93	7.71	21.03	8.72
Relationship concerns	28.05	8.37	28.45	9.32	24.58	7.91	26.13	8.16
Rejection of a childfree lifestyle	37.07	9.81	32.10	8.61	30.87	8.65	26.69	9.19
Need for parenthood	42.69	11.13	36.14	10.36	44.76	9.14	37.79	10.08
FertiQoL Emotional	32.04	15.20	61.64	16.00	42.24	16.99	63.65	19.06
FertiQoL Mind & Body	46.84	24.41	72.85	16.12	51.29	21.99	75.00	17.25
FertiQoL Relational	65.80	14.28	65.80	17.66	75.29	15.30	67.21	17.54
FertiQoL Social	52.30	17.42	66.09	15.18	57.18	16.55	66.15	19.94

Note. FertiQoL = The Fertility Quality of Life Tool.

## Main analyses

To examine the effect of the group intervention (pre-test, post-test) on all outcome variables, a series of (2) X (2) repeated-measure ANOVAs, with gender as a repeated measure for the dyad, were conducted. Although several analyses were conducted (one per outcome variable), we did not perform a Bonferroni correction because the goal of the study was to test the ability of the intervention to produce a clinically significant improvement. As such, although statistical significance was examined, the focus was placed on the magnitude of the effect sizes. Modifying the alpha level using a Bonferroni correction would not have changed the effect sizes obtained, nor our conclusions about the preliminary efficacy of the intervention.

## Psychological outcomes

The participants reported a significant decrease in depression symptoms ( $F(1, 28) = 5.34, p = .028, \eta^2_p = .16$ ) after participating in the group intervention, with a large effect size. The reduction in anxiety levels due to the intervention was not statistically significant ( $F(1, 28) = 3.07, p = .091, \eta^2_p = .10$ ), but the effect size was medium. With regards to infertility-related concerns (FPI scores), significant pre- and post-intervention increase in stress levels related to the need for parenthood ( $F(1, 26) = 5.21, p = .031, \eta^2_p = .17$ ) and decrease in the rejection of childfree life style ( $F(1, 28) = 15.64, p < .001, \eta^2_p = .36$ ) were found, with large effect sizes. However, no statistically significant differences were observed in infertility-related social concerns ( $F(1, 28) = .09, p = .768, \eta^2_p = .03$ ), and the effect size was small. In terms of infertility-related QoL, participants reported a statistically significant increase in emotional QoL ( $F(1, 28) = 8.96, p = .006, \eta^2_p = .24$ ), with a large effect size. Although no significant effect was found for the intervention with respect to mind & body QoL ( $F(1, 28) = 1.74, p = .198, \eta^2_p = .06$ ) and social QoL ( $F(1, 28) = 2.19, p = .150, \eta^2_p = .07$ ), the effect sizes obtained were medium.

## Relationship and sexual outcomes

Participants did not report significant improvements in global relationship satisfaction ( $F(1, 26) = .59, p = .451, \eta^2_p = .02$ ) or sexual satisfaction ( $F(1, 28) = .79, p = .380, \eta^2_p = .03$ ) after participating in the group (small effect sizes). However, a significant increase in relationship benefits was found ( $F(1, 27) = 5.88, p = .022, \eta^2_p = .18$ ), with a large effect size. No significant effects were observed for the intervention with respect to the infertility-related relationship ( $F(1, 27) = 2.51, p = .124, \eta^2_p = .09$ ) and sexual ( $F(1, 27) = .00, p = .953, \eta^2_p = .00$ ) concerns, although the effect size for relationship concerns was medium. However, infertility-related relational QoL ( $F(1, 28) = 5.06, p = .033, \eta^2_p = .15$ ) significantly increased from pre- to post-intervention. The large interaction effect obtained (time X gender;  $F(1, 29) = 11.19, p = .002, \eta^2_p = .29$ ) suggests that this increase was significantly stronger for women than for men.

## Intervention satisfaction and acceptability

In terms of global satisfaction with the group intervention, the overall mean rating was 4.87 out of 5 ( $SD = .33$ ). More specifically, participants reported high satisfaction with the group content and material ( $M = 4.87; SD = .36$ ), as well as with the therapists' interventions ( $M = 4.89; SD = .20$ ). Participants also reported high satisfaction with the physical environment ( $M = 4.52; SD = .83$ ) and the schedule ( $M = 4.75; SD = .48$ ). Lastly, participants reported that the group was very useful in helping them through the fertility treatment process ( $M = 4.77; SD = .63$ ).

In total, 78 couples showed an interest in participating in the group, but 46 couples declined to participate before the group began for various reasons: no longer interested by the time the group started, became pregnant, partner did not want to participate, location was too far. Moreover, given that 3 couples did not complete the intervention, the attrition rate was 9.37%.

Non-completers did not statistically differ from the completers on any of the main study variables. In terms of attendance, the mean number of sessions attended was 5.2 out of 6 ( $SD = .93$ ) for women and 5.1 ( $SD = .83$ ) for men.

## Discussion

This proof-of-concept study assessed the preliminary acceptability of a novel psychoeducational and support group for both partners of couples seeking fertility treatment and explored its potential usefulness in addressing psychological and relationship outcomes. Our results suggest that this new group-based intervention is a promising treatment option for individuals with fertility problems.

### *Psychological outcomes*

As hypothesized, there was a significant improvement in psychological adjustment and quality of life following the group intervention. Specifically, both women and men reported fewer depressive symptoms and an increase in emotional quality of life after participating in the group. This finding is in line with previous research showing a decrease in depression symptoms (Faramarzi et al., 2008; McNaughton-Cassill, Bostwick, Arthur, Robinson, & Neal, 2002) and an increase in emotional quality of life (Li et al., 2016) in women participating in group interventions. Our study however, evidenced that the group intervention could also lead to significant reductions in negative emotional consequences for men, who also tend to report feelings of hopelessness and loneliness, a sense of lack of control, and a perceived ambivalence of social support during the fertility treatment process (Schick, Rösner, Toth, Strowitzki, & Wischmann, 2016). One of the goals of the group intervention developed within the present study, was to normalize and validate these feelings as they arise throughout the participants' experience with infertility and its treatment. This may have alleviated both partners' negative feelings, and led to a decrease in their depressive symptomatology and subsequently, an improvement in their emotional well-being. Moreover, partaking in the group may also have reduced participants' perceived loneliness, since members are invited to share their experience with other members, and are more likely to feel understood by people having similar problems.

Our results also revealed a significant decrease in participants' stress related to the rejection of a childfree lifestyle, but significant increase in their stress associated with the need for parenthood. These findings are in line with a previous study which showed a reduction in the former area of concern, following a CBT group intervention (Faramarzi et al., 2013). During our group intervention, couples learned to focus on other couple projects, revisited their definition of family, and opened the dialog on alternative options, which may have reduced their anxiety about leading a childless life. Since couples were still involved in fertility treatment, however, they were not expected to abandon their family project following the group intervention and thus, their hope to become parents and related stress increased over the two-month period, likely reflecting the prolonged wait to achieve pregnancy.

No statistically significant pre- to post-intervention differences were observed in our study with respect to participants' general anxiety symptoms; however, a medium effect size was found, which suggests that in a larger sample, the intervention may be helpful in improving anxiety symptoms. Previous randomized controlled trials, exclusively targeting women, have shown that group interventions using CBT or MB approaches significantly reduce anxiety (Chan et al., 2006; 2012;; Domar et al., 2000; Lee, 2003). Our results extend these findings by suggesting that a group-based intervention may also be helpful in reducing anxiety symptoms in men. Our group intervention offers couples tools to manage their stress and cope with the fertility treatment process and provides them with information about the different options and types of fertility

treatments. As Chan et al. (2006) mentioned in their study, acquiring medical knowledge about fertility treatment increases the predictability of the treatment process, which may help reduce the stress and anxiety associated with treatment.

While we did not find a significant effect of the intervention on the mind-body QoL domain (e.g., physical health, cognition, behavioral functioning), the effect size was medium, suggesting that in a larger sample, our group may improve mind-body QoL. This would be consistent with a previous study by Li et al. (2016), which showed an increase in mind-body QoL following a MB group. Their results suggest that group interventions can help individuals become more aware of their emotions and physical stress, which can increase their subjective well-being, reduce psychological symptoms, and improve behavioral regulation (Keng, Smoski, & Robins, 2011).

Our results did not reveal significant changes in terms of fertility-related social QoL and infertility-related social concerns. Nonetheless, the effect size was medium for fertility-related social QoL, suggesting that the intervention could potentially be helpful in improving social QoL, which is consistent with Li et al. (2016)'s findings. Our group intervention addresses the social aspects related to the experience of infertility by reviewing society expectations about family, validating emotions (e.g. shame, embarrassment), and encouraging participants to seek social support. Moreover, participating in the group helps reduce participants' social isolation.

### **Relationship outcomes**

In addition to improving individuals' psychological well-being, our results suggest that our new intervention could also be helpful in strengthening couple relationships. More specifically, our findings revealed a significant improvement in fertility-related relational QoL and an increase in marital benefits for both partners. These results are in line with a previous study reporting increased marital benefits following a group intervention that promotes better communication within the couple (Schmidt et al., 2005). The significant change in the relational domain might also be attributed to the inclusion of both partners within our intervention. This creates an environment in which partners can bond with each other, given that they are engaged in a shared hardship, and enables them to both be invested in seeking help. The feeling of shared partnership has been shown to be beneficial for the adjustment of both partners of couples undergoing fertility treatment, and to strengthen their relational bonds (Sauvé et al., 2018).

Although the effect on fertility-related relational QoL was found in both partners, women showed a stronger improvement than their partners. In the context of infertility, men tend to assume a protective role and support their partners, who can be affected by this experience more intensely (de Faria, Grieco, & de Barros, 2012). Since our group intervention offers couples tools to better communicate, and be more attentive to each other's needs, men may have been encouraged to be more reassuring towards their female partners (Hasanpoor-Azghdy, Simbar, & Vedadhir, 2014). As a result, women who felt better supported and validated, may have considered their relationship to be less negatively affected by infertility and its treatment. Men's decision to take part in the intervention, which represents their commitment in the process, may also have helped women feel comforted and more secure in their relationship.

Despite the non-significant results regarding infertility-related relational concerns, a medium effect size was obtained, suggesting that our intervention may be helpful in alleviating the impact of infertility-related stress on couple relationships. This would corroborate Faramarzi and colleagues (2013)'s finding that a psychological group intervention could lead to significant improvements in infertility-related relational concerns. Talking about and sharing emotions can be challenging for infertile couples (Van den Broeck, Emery, Wischmann, & Thorn, 2010). Therefore, it is possible that by participating in a group together and learning new communication skills, partners would reduce the burden of infertility on their relationship.

Our results did not indicate a significant increase in global relationship satisfaction. This could be due to the general nature of the DAS-4, which may not be particularly sensitive to the specific effects of infertility on couple relationships. This would explain why effects were found when infertility-specific outcome variables were considered (e.g., infertility-related quality of life). It should also be noted that infertile couples generally report relatively high levels of relationship satisfaction (Abbey, Andrews, & Halman, 1995). Therefore, prior to beginning the intervention, it is likely that participants were already considerably satisfied with their relationship.

Finally, our results did not reveal pre- to post-intervention differences in infertility-related sexual concerns and global sexual satisfaction. Sexual variables were exploratory outcomes in this study. Although the group facilitators mentioned that there may be difficulties in sexuality associated with the infertility process, this aspect was not widely addressed during the intervention, which could explain why significant differences were not observed.

### **Acceptability and treatment satisfaction**

Both members of the couple reported high levels of satisfaction with the intervention overall, as well as with the content, the therapists, and the intervention modalities (i.e., schedule, location). Moreover, both partners indicated that the group was helpful in accompanying them during their fertility treatment process. Qualitative statements made by participants (e.g., “I really appreciated the group and it helped us with our problems and our relationship”) were also very positive and suggest that the group intervention has met their particular needs.

Results of this preliminary study also support the acceptability of the intervention, designed for both partners of couples undergoing fertility treatment. A high degree of adherence was observed, and the dropout rate was reasonable and partly explained by positive factors (i.e., pregnancy). Despite these positive indicators, recruitment for this intervention study was difficult and yielded high rates of refusal prior to the beginning of the group. These rates may be reflective of participants’ hesitation to participate in an intervention delivered within a group format, a context that can be intimidating to some. High participant refusal rates may also be explained by the demanding and time-consuming nature of the fertility treatment process, making individuals less inclined to participate. More research is needed to shed light on this important issue.

### **Limitations**

Despite its numerous strengths, this preliminary study has a few limitations. Firstly, the study did not include a follow-up assessment, which would help determine whether the gains from the intervention are maintained over time. Secondly, given the early phase of the study, the sample size was small, limiting the generalizability of our findings. Moreover, we did not have a control group against which to compare our results. This limits our ability to determine the source of the treatment effect for our intervention and rule out the effects due to the passage of time. However, our results are promising and justify a more rigorous testing using a randomized controlled design in a subsequent study. Lastly, since only heterosexual couples were included in this study, our sample may not be representative of all couples undergoing fertility treatment. A larger, more diverse sample of infertile couples should be included in the next stage of treatment development to ensure that findings are more representative of this population.

### **Clinical implications and conclusion**

“Our participation in the group was a gift we took without regret. These moments have helped us grow as a couple and brought us even closer together during this difficult time.”

The testimony shared by one of our participants illustrate fittingly our purpose in designing the first group-based intervention, to our knowledge, for French-Canadian couples seeking fertility treatment. Overall, our preliminary findings point to the acceptability and efficacy of this novel psychoeducational and support intervention in reducing the negative impact of infertility on couple relationships, and improving treatment consequences for both men and women seeking fertility treatment. This suggests that there is a need to consider further developing and testing, using randomized designs, group interventions that include both partners, and that address their needs as individuals, and as a couple. Indeed, in addition to reducing the psychological burden associated with infertility, group interventions can also help couples grow stronger together, and support each other during this demanding process.

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