

Sexual function and satisfaction in couples with infertility:

A closer look at the role of personal, relational, and treatment-related characteristics

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1 **Abstract**

2 **Background.** Research to date suggests that couples undergoing assisted reproductive technology
3 (ART) are at a high risk of experiencing sexual difficulties.

4 **Aim.** This dyadic cross-sectional study aimed to provide a better understanding of the infertility-
5 specific personal (i.e., emotional, mind-body) and relational stressors associated with the sexual
6 desire, orgasm, arousal, and sexual satisfaction of couples seeking ART.

7 **Methods.** The sample included 185 mixed-sex couples seeking ART. Participants completed
8 online the Fertility Quality of Life tool and either the Female Sexual Function Index or the
9 International Index of Erectile Function. Data were analyzed using path analyses based on the
10 Actor-Partner Interdependence Model.

11 **Outcomes.** Individuals' own and their partners' sexual function (desire, orgasm, arousal domains)
12 and sexual satisfaction.

13 **Results.** For men and women, infertility-related emotional stressors were associated with their
14 own and their partner's lower sexual desire. For women, experiencing greater infertility-related
15 emotional stressors was also associated with their partner's lower sexual satisfaction. While
16 experiencing greater infertility-related mind-body stressors was not associated with men and
17 women's own sexual desire, arousal, orgasm, and satisfaction, for women, it was associated with
18 their partner's lower sexual arousal. Lastly, for men and women, infertility-related relational
19 stressors were associated with their own lower sexual arousal, as well as with their own and their
20 partner's lower sexual satisfaction. For women, experiencing greater relational stressors was also
21 associated with their own lower sexual desire and orgasm.

22 **Clinical Implications.** Interventions addressing the emotional, mind-body, and relational spheres
23 of couples seeking ART may help facilitate improvements in sexual function and satisfaction and
24 better serve their needs.

25 ***Strengths and Limitations.*** This study included a large sample of couples. Our sample was
26 heterogeneous with regards to couples' cause of infertility and treatment stage. The use of an
27 infertility-related measure allowed us to better capture personal and relational stressors specific to
28 couples seeking ART. Given the cross-sectional design of our study, causality between infertility-
29 related stressors and sexual function and satisfaction cannot be inferred. Our sample included
30 predominantly White, mixed-sex individuals with a high level of education, which may reduce
31 the generalizability of our findings.

32 ***Conclusion.*** Couples' subjective experience of infertility and treatment (personal and relational
33 stressors) seems to be strongly associated with their sexual health, allowing us to identify
34 potential targets of intervention with couples seeking ART.

35 ***Keywords:*** Infertility; assisted reproductive technology; sexual function; sexual satisfaction;
36 infertility-related stressors; couple relationships

37 **Sexual Function and Satisfaction in Couples with Infertility: A Closer Look at the Role of**
38 **Personal and Relational Stressors**

39 Infertility is defined as the inability to conceive after one year of regular unprotected
40 vaginal intercourse or to carry a pregnancy to term¹ and affects 12% to 16% of couples
41 worldwide.^{2,3} The diagnosis and treatment of infertility is associated with significant personal and
42 relational stressors,⁴ including psychological distress⁵ and disruptions in daily activities.⁶
43 Research has also shown that couples seeking assisted reproductive technology (ART) are more
44 likely to experience sexual difficulties than fertile couples.⁷

45 Sexual function and satisfaction are recognized as essential aspects of relationship
46 adjustment and health-related quality of life.^{8,9} Sexual function refers to sexual response
47 including desire, orgasm, and arousal during sexual intercourse in women¹⁰ and men.¹¹ Sexual
48 satisfaction, however, is defined as the “affective response arising from one’s subjective
49 evaluation of the positive and negative dimensions associated with one’s sexual
50 relationship”.^{12,p.268} While research has increasingly investigated the factors associated with
51 psychological, relational and social well-being, few studies have examined the factors associated
52 with sexual adjustment in the context of infertility.^{7,13} Moreover, studies have largely focused on
53 women’s perspectives, neglecting to consider that infertility affects the couple as a unit and the
54 dyadic nature of sexuality. A better understanding of the role of infertility-specific personal and
55 relational stressors in the sexual function and satisfaction of couples is warranted to help them
56 manage the burden associated with infertility and treatment procedures.

57 **Sexual Health of Couples Seeking ART**

58 Issues related to sexuality are crucial aspects of the lives of couples seeking ART. While
59 attempting to conceive involves giving significant attention to sexual activity, during fertility
60 treatments, vaginal intercourse tends to be put aside or becomes task-oriented for some couples.¹⁴

61 Individuals seeking ART are often given instructions from healthcare teams about the timing of
62 sexual activity to increase chances of conception. Some couples thus reveal that sex may become
63 “mechanical” and subsequently report lower sexual self-esteem and a loss of control over their
64 sex lives.¹⁵

65 A few controlled studies have reported higher levels of sexual dysfunction in women
66 seeking ART,^{16,17} mainly impairments in arousal, desire, and orgasm.^{18,19} Relative to controls,
67 higher levels of premature ejaculation,²⁰ erectile dysfunctions,²¹ and lower desire and orgasmic
68 function²² have also been reported in men seeking ART. Individuals seeking ART have also been
69 found to experience greater sexual dissatisfaction than fertile controls.^{23,24} However, other studies
70 have reported either greater sexual pleasure and more frequent intercourse in couples seeking
71 ART^{25,26} or no change in sexual function²⁷ compared with population norms. These conflicting
72 findings suggest that there is considerable variability in how infertility and its treatment may
73 affect the sexual experiences of couples seeking ART.

74 Diagnosis and treatment-related factors often dictate the timing and frequency of sexual
75 relations,²⁸ but previous studies have yielded inconsistent results regarding their associations with
76 the sexual health of individuals seeking ART. One study found no association between the cause
77 of infertility and sexual function,¹⁸ whereas others have found that individuals facing infertility
78 due to male factors experienced greater difficulty discussing sexual activities²⁵ and lower sexual
79 satisfaction,²⁹ and that women with infertility related to female factors indicated a more negative
80 impact on their sex lives due to infertility.³⁰ Similar rates of sexual dysfunction were also
81 reported among couples using in vitro fertilization and intrauterine insemination,³¹ although one
82 study reported that the latter was associated with higher sexual frequency.²⁵ These conflicting
83 findings suggest that sexual difficulties experienced by couples seeking ART may not necessarily
84 stem from objective diagnosis or treatment characteristics and highlight the need for further

85 research to investigate other variables that may better account for the sexual health of these
86 couples.

87 **Infertility-Related Stressors**

88 Research has found that the burden associated with infertility and its treatment generates
89 personal (emotional, physical, cognitive, behavioral) and relational stressors that persist over
90 time⁶ and may be consequential to couples' sexual function and satisfaction.

91 *Personal Stressors*

92 A number of studies have demonstrated the association between greater symptoms of
93 depression or anxiety and higher sexual infertility stress³² and poorer sexual function.^{27,33}
94 However, these previous studies have not examined whether other emotional, physical, cognitive,
95 and behavioral disruptions are related to sexual health during infertility and its treatment. There is
96 significant stress associated with the experience of infertility and treatment,^{34,35} that often elicits
97 feelings of anger, isolation, grief, guilt, and personal failure for men and women.³⁶ Beyond
98 emotional stressors, the experience of infertility and its treatment can become a substantial
99 physical burden. Several diagnostic and treatment procedures can be perceived as physically
100 invasive and cause physical discomfort and pain.⁶ Women taking ART medication have also
101 reported physical side effects, including hot flashes, vaginal dryness, dizziness, and fatigue.³⁷

102 The physical and emotional effects, expenses, rigorous schedule and recovery related to
103 treatments often overtake other aspects of couples' lives. As such, both men and women report
104 feeling a loss of control over their lives and difficulty concentrating on their daily occupations
105 and long-term goals.³⁸ These disruptions to multiple facets of their lives have been shown to limit
106 their ability to engage in everyday tasks,^{6,39} including sexual activities, whereby couples report
107 reductions in the frequency of sexual activity,⁴⁰ which could affect their sexual function and
108 satisfaction.

109 Some studies have suggested that men and women may experience infertility-related
110 personal stressors differently,⁴¹ with women reporting more adverse effects on their self-esteem,
111 stress, depression, and anxiety⁴² and negative consequences on their quality of life⁴³ and sexual
112 life.⁴⁴ Other studies, however, have reported no gender differences in the quality of life of
113 couples coping with infertility.⁴ Given the complex nature of the associations between infertility
114 and sexuality,⁴⁵ it seems essential to consider the infertility-specific emotional and physical
115 stressors, as well as the cognitive and behavioral disruptions underlying both men and women's
116 sexual function and satisfaction to better inform infertility management and improve couples'
117 quality of life.

118 ***Relational Stressors***

119 In addition to being associated with personal distress, studies have highlighted the threat
120 that infertility represents to intimate relationships.^{4,13,46} Couples often face difficult decisions
121 during treatment, including determining whether treatment should be discontinued, and deal with
122 the financial burden that accompanies fertility treatments.⁴⁷ Moreover, infertility may force
123 individuals to reevaluate their affiliation with their chosen partner and may also result in them
124 feeling unworthy of their partner.⁴⁸ Several studies have demonstrated an association between
125 infertility and more relationship and communication issues,⁴⁹ self and partner blame,⁵⁰ and lower
126 relationship adjustment.⁵¹ Studies have also reported lower relationship satisfaction in couples
127 coping with infertility compared to controls,⁵² as well as fears of abandonment or breakup.⁵³ The
128 findings regarding the associations between infertility and relationship adjustment are
129 inconsistent however, as some studies have reported that infertility can bring partners closer
130 together, with some infertile couples reporting a better relationship than fertile couples.^{54,55,56,57}

131 Couples often engage in sex as a way to express their feelings of intimacy, affection, and
132 closeness with their partner.¹⁵ Luk and Loke⁵⁸ found that one third of women and men facing

133 infertility reported being unable to show their feelings to their partner out of fear of making them
134 upset. Men have been found to be less willing to discuss their problem of infertility,⁵⁹ and to
135 share their feelings and negative emotions with their partner, whereas women have been found to
136 be more concerned about the effect of infertility on their closeness with their partner⁵⁸ and to be
137 less satisfied with the level of expressed affection within their relationship.⁶⁰ Given that in fertile
138 populations, lower cohesion, intimacy and relationship satisfaction are associated with poorer
139 sexual function,⁶¹ these additional challenges of ART on relationships (e.g., difficulties in
140 communication, commitment and affection, pressure related to sexual intercourse) may have
141 stronger consequences for couples' sexual function and satisfaction.

142 In the few studies examining relational factors associated with sexual outcomes in
143 individuals experiencing infertility, lower perceived intimacy, relationship satisfaction, and
144 greater relational concerns have been linked to lower sexual satisfaction⁵⁸ and function.⁶²
145 However, these studies either only involved one member of couples seeking ART, did not use an
146 infertility-related measure of relational concerns, or did not consider the effects of these stressors
147 on individuals' own as well as their partner's sexual health.

148 The limited research on infertility-related relational stressors and couples' sexual health
149 and the limitations of previous studies, in addition to conflicting findings regarding the
150 relationship adjustment of couples coping with infertility highlight the need for further research
151 investigating these associations to better determine the factors that may make certain couples
152 seeking ART more vulnerable to developing sexual problems than others.

153 *Partner Effects*

154 Infertility is a life crisis for both men and women,⁴ that is associated with significant
155 personal and relational stressors for both partners. Partners are considered to be inherently
156 interdependent in cultivating a mutually satisfying sexual relationship,⁶³ which may become

157 significantly more challenging for both members of the couple when a partner is faced with an
158 illness.⁶¹ Only a few studies have examined sexual function in samples of couples experiencing
159 infertility.⁷ These studies have generally focused on the prevalence of sexual dysfunctions, used
160 heterogeneous measures to assess sexual response, including non-validated measures of sexual
161 function, and failed to address partners' sexual health, limiting our understanding of the sexual
162 experiences of couples as a whole. Nakić Radoš et al.⁶⁴ have examined the association between
163 infertility and sexuality from a dyadic perspective and have found that women's and men's greater
164 sexual concerns were associated with their partner's lower levels of sexual satisfaction. This
165 study however, did not consider infertility-specific personal as well as relational factors
166 associated with sexual function and satisfaction. Nevertheless, studies to date underscore the
167 importance of involving both members of the couple when examining the sexual health of
168 couples coping with infertility.

169 **The Present Study**

170 The aim of this dyadic study was to examine the associations between infertility-related
171 personal (i.e., emotional, mind-body) and relational stressors and both partners' sexual function
172 (desire, orgasm, arousal) and satisfaction. We hypothesized that experiencing higher levels of
173 infertility-related emotional, mind-body (physical burden of treatment, disruptions in daily life)
174 and relational stressors would be associated with lower sexual desire, orgasm, arousal, and
175 satisfaction for the individual and for their partner. Gender differences in the associations
176 between these infertility-related stressors and domains of sexual function and satisfaction were
177 also examined. No a priori hypotheses were put forward, however, due to the inconsistencies of
178 previous research and the paucity of research on gender differences in sexual health in the context
179 of infertility.

180 **Methods**

181 The present cross-sectional study combined data from two larger research studies
182 involving couples seeking ART. The first study was designed to explore the psychological,
183 relational and sexual well-being of couples seeking treatment for infertility and the second
184 gathered data regarding patient, treatment, and clinic factors predicting treatment burden and
185 treatment non-compliance in couples seeking ART. Both studies utilized similar designs,
186 recruitment procedures, and inclusion criteria, with the exception that couples needed to be
187 within six months of seeking any type of assisted reproductive services at a fertility clinic to
188 participate in the second study. The studies have been approved by the universities' review
189 boards and the fertility clinics partaking in the studies.

190 **Participants**

191 Couples seeking assisted reproductive services at the time of their participation were
192 recruited for the study. Inclusion criteria included 1) being involved in a romantic relationship, 2)
193 being 18 years of age or older, 3) both partners participating in the study, and 4) participants
194 having a good spoken and written comprehension of French or English. Single mothers and
195 individuals in same-sex relationships were excluded for the purpose of this study. While we
196 recognize same-sex or same-gendered couples may also experience involuntary childlessness,
197 their experiences and needs could significantly differ from those of mixed-sex couples seeking
198 ART, given the additional barriers that they may face (e.g. stigma).⁶⁵ Moreover, this study
199 focused on medical infertility given the closer link between infertility treatment and sexual
200 practices (e.g., ritualized, procreative approaches to sex) for couples experiencing medical
201 infertility.⁴⁵ The measure used to assess infertility-related personal and relational stressors in this
202 study was also designed to address medical infertility and has not been validated with couples
203 who are using ART for other reasons than medical infertility.

204 The initial sample consisted of 219 mixed-sex couples seeking ART. However, as is

205 generally recommended to ensure that the main outcome measures represent a valid assessment
206 of couples' sexual function and satisfaction,^{66,67} couples ($n = 34$) in which one or both members
207 did not indicate engaging in sexual activity over the past four weeks were excluded from the
208 analyses. Of the couples excluded, only 6.1% were still waiting for an infertility diagnosis,
209 whereas this proportion was significantly higher (25%) for couples included in the study,
210 $X^2(1,217) = 5.83, p = .016$. A significant difference was also observed in terms of age, $F(1, 208)$
211 $= 5.59, p = .019; \eta_p^2 = .03$ and treatment duration, $F(1, 206) = 5.40, p = .021; \eta_p^2 = .03$, with
212 excluded couples being older (excluded men: $M = 36.21, SD = 4.52$ and women: $M = 33.03, SD =$
213 3.96 ; included men: $M = 33.56, SD = 4.91$ and women: $M = 31.86, SD = 4.71$) and in treatment
214 for longer (excluded couples: $M = 2.15, SD = 1.62$; included couples: $M = 1.71, SD = 1.29$). The
215 final sample consisted of 185 couples. Couples' demographic and clinical information are
216 presented in Table 1.

217 **Procedure**

218 Participants were recruited in person (40.5%) or through advertisements placed in various
219 fertility clinics and posted on several infertility-related association websites and social media in
220 Canada and the United States (59.5%). Participants were contacted by a research assistant by
221 phone or email for online recruitment or in-person at their fertility clinic to provide them with
222 information regarding the study procedure and ensure that both partners were interested in
223 participating. They were screened by a research assistant by telephone or in-person to verify their
224 eligibility for the study. Both partners were asked to complete the consent form and separate
225 online questionnaires via a secure online platform. Couples received compensation of either \$15
226 in gifts cards or a \$20 cheque for their participation, depending on the study they took part in.
227 The participant flow chart is presented in Figure 1.

228 **Measures**

229 Demographic and medical information (presence of a diagnosis, cause of infertility, use of
230 fertility medication, duration of conceiving difficulties, treatment type and duration), and details
231 about participants' relationships (duration of relationship and cohabitation) were collected using a
232 self-report investigator made questionnaire.

233 *Infertility-Related Stressors*

234 The Fertility Quality of Life tool⁶⁸ (FertiQol) assesses the burden of infertility and
235 treatment on diverse life areas. The scale includes 36 items. The present study focused on the
236 items assessing the experience of 1) personal (emotional and mind-body) and 2) relational
237 infertility-related stressors. The emotional domain (6 items) measures the extent to which
238 individuals experience negative emotions (e.g., sadness, resentment) in relation to their fertility
239 problems. Sample items include “does treatment negatively affect your mood?” and “do you
240 fluctuate between hope and despair because of fertility problems?”. The mind-body domain (6
241 items) assesses the impact of infertility on physical health (e.g., pain), cognitions (e.g., poor
242 concentration) and behavior (e.g., disruptions in daily activities). Sample items include “are you
243 bothered by fatigue because of fertility problems?” and “do your fertility problems interfere with
244 your day-to-day work or obligations?”. The relational domain (6 items) measures the extent to
245 which intimate relationships have been affected by fertility problems. Sample items include “do
246 you find it difficult to talk to your partner about your feelings related to infertility?” and “have
247 fertility problems had a negative impact on your relationship with your partner?”. Items are rated
248 on various 5-point Likert-type scales. Subscale scores range from 0-100, with higher scores
249 indicating that infertility had a lower impact on personal and relational domains. The instrument
250 is considered a reliable (Cronbach's alpha ranging from .72 to .92) and sensitive tool of the
251 impact of infertility on different life domains.⁶⁸ In the current sample, the internal consistency of
252 the emotional, mind-body, and relational domains (α ranging from .73 to .86 for women, α

253 ranging from .69 to .85 for men) was satisfactory.

254 *Domains of Sexual Function*

255 Women's sexual function was measured using the Female Sexual Function Index¹⁰
256 (FSFI), a 19-item self-report measure of sexual function over the last month, in five different
257 areas: desire (2 items), arousal (4 items), orgasm (3 items), lubrication (4 items), pain (3 items).
258 Each item is rated on a 5 or 6-point scale. This study focused on the desire, arousal, and orgasm
259 subscale scores of the FSFI. Individual domain scores are obtained by adding the scores of
260 individual items that comprise the domain and multiplying the sum by the domain factor. Sample
261 items include "over the past 4 weeks, how often did you feel sexual desire or interest?" and "over
262 the past 4 weeks, how would you rate your level of sexual arousal?". Subscale scores range from
263 0 (or 1) to 6, with higher scores indicating better sexual function. The scale has been shown to
264 have good psychometric properties, including high test-retest reliability for each domain, good
265 construct and divergent validity, and a high degree of internal consistency ($\alpha = .82$ or higher).¹⁰
266 The FSFI was found to have a high level of internal consistency in the current sample (α ranging
267 from .86 to .90 for domain scores).

268 Male sexual function was measured using the International Index of Erectile Function¹¹
269 (IIEF), a 15-item self-report measure of sexual function in three different areas: erectile function
270 (6 items), orgasmic function (2 items), sexual desire (2 items). Each item is rated on a 5 or 6-
271 point scale. This study focused on the individual subscale scores. Scores range from 0 (or 1) to 10
272 for the orgasmic function and sexual desire domains and from 0 (or 1) to 30 for erectile function.
273 Higher scores indicate better sexual function. Sample items include "over the past 4 weeks, how
274 often were you able to get an erection during sexual activity?" and "over the past 4 weeks, how
275 much have you enjoyed sexual intercourse?". The IIEF has been shown to have adequate
276 construct validity, highly significant test-retest repeatability, and a high degree of internal

277 consistency for the five domains ($\alpha = .73$ and higher)¹¹. The IIEF was found to have a good level
278 of internal consistency in the current sample (α ranging from .80 to .82 for domain scores).

279 ***Sexual Satisfaction***

280 The satisfaction subscales of the FSFI¹⁰ (3 items) and the IIEF¹¹ (2 items) were used
281 separately as indices of overall sexual satisfaction. Sample items include “over the past 4 weeks,
282 how satisfied have you been with your sexual relationship with your partner?” and “over the past
283 4 weeks, how satisfied have you been with your overall sexual life?”. The satisfaction subscales
284 were found to have a good level of internal consistency in the current sample (FSFI: $\alpha = .86$,
285 IIEF: $\alpha = .94$).

286 **Statistical Analysis**

287 An a priori power analysis was conducted using APIMPowerR, a statistical app designed
288 to estimate power for dyadic studies.⁶⁹ With a power of .80 and an alpha of .05, the minimum
289 number of participants needed for a medium effect size of actor effects (i.e., associations between
290 an individual’s score on the predictor and their own score on the outcome) was 59 couples, and
291 for a small effect size of partner effects (i.e., associations between an individual’s score on the
292 predictor and their partner’s score on the outcome) was 159 couples.

293 SPSS[®] Statistics 26.0⁷⁰ was used for preliminary data analyses. Prior to performing the
294 main analyses, data were screened for outliers, missing values, and normality. Variables were
295 normally distributed with the exception of men’s erection and orgasm scores. Non-parametric
296 bootstrapping (2000 samples) was used in the main analyses to account for the non-normality of
297 the variables. Exploration of missing data was completed using SPSS Missing Values Analysis.
298 Within the main variables, only 5.7% of data were missing. Little’s Missing Completely at
299 Random test⁷¹ suggested that these values were missing completely at random ($p = .09$). Missing
300 values were replaced using single imputation (expectation-maximization algorithm).

301 Preliminary correlations and repeated-measures MANOVAs (with gender being the
302 repeated factor for the dyad) were performed to identify potential covariates among the
303 sociodemographic, diagnosis and treatment-related variables. These analyses yielded non-
304 significant associations between age, income, relationship duration, marital status, presence of an
305 infertility diagnosis, cause of infertility, use of fertility medication, duration of conceiving
306 difficulties and treatment type and both partners' domains of sexual function (desire, orgasm,
307 arousal) and sexual satisfaction. Therefore, these variables were not included as covariates in the
308 main analyses. Treatment duration was significantly associated with sexual desire and
309 satisfaction for men, with those who reported receiving treatment for longer periods of time
310 reporting lower sexual desire ($r = -.21, p = .005$) and satisfaction ($r = -.23, p = .002$). Thus,
311 treatment duration was included as a covariate in the main analyses.

312 To examine the associations between infertility-related personal (emotional, mind-body)
313 and relational stressors and both partners' domains of sexual function (desire, orgasm, arousal)
314 and satisfaction, path analyses using the Actor-Partner Interdependence Model⁷² (APIM) were
315 performed with the SPSS Amos software (version 25).⁷³ This approach addresses the
316 nonindependence of dyadic data and treats the couple as the unit of analysis. It integrates both
317 actor and partner effects. The design also reduces the overall number of analyses conducted and
318 enables us to test gender differences in actor and partner effects.

319 Given the dyadic nature of the model, we included both partners' sexuality subscales (i.e.,
320 women and men's sexual desire, orgasm, arousal, and satisfaction) in the APIM analysis.
321 Standardized scores were computed for these subscales to facilitate the interpretation and
322 comparison of findings between men and women. The final model included each partner's
323 infertility-related emotional, mind-body and relational stressors as predictors of sexual desire,
324 orgasm, arousal, and satisfaction. Treatment duration was initially included as a control variable.

325 However, when included in the model with the emotional, mind-body and relational stressors,
326 treatment duration was no longer significantly associated with men or women's sexual desire,
327 orgasm, arousal and satisfaction and was therefore removed. This result further supports our
328 earlier argument that personal and relational stressors may be stronger predictors of couples
329 seeking ART's sexual health than diagnosis or treatment related factors. Model fit was assessed
330 using the following fit indices:⁷⁴ a non-significant chi-square, a value of the comparative fit index
331 (CFI) greater than .95, and a value of the root mean square error of approximation (RMSEA)
332 below .06 and its 90% confidence interval. To test gender differences in actor and partner effects,
333 a within-dyad test of distinguishability was performed.⁷²

334 **Results**

335 The descriptive statistics and the bivariate correlations between infertility-related personal
336 and relational stressors and domains of sexual function and satisfaction are shown in Table 2.

337 **Infertility-Related Personal and Relational Stressors**

338 When comparing a model in which all parameters were free to vary and a model in which
339 all the effects were constrained to be equal between men and women, a significant difference in
340 Chi-square was obtained ($\Delta\chi^2(24) = 39.165, p = .026$), indicating that there were significant
341 differences between men and women's actor and partner effects. A semi-constrained model was
342 therefore retained, which constrained only the actor and partner effects that did not differ
343 significantly between men and women ($\Delta\chi^2(16) = 19.857, p = .227$). This model achieved a good
344 fit: $\chi^2(30) = 29.644, p = .484$; CFI = 1.000; RMSEA = .000, 90% CI [.000; .055]. The final path
345 model is displayed in Figure 2 and the 90% confidence intervals for the standardized regression
346 coefficients are presented in Table 3.

347 Results indicated that for men and women, infertility-related emotional stressors were

348 associated with their own and their partner's lower sexual desire. For women, experiencing
349 greater infertility-related emotional stressors was also associated with their partner's lower sexual
350 satisfaction. While experiencing greater infertility-related mind-body stressors was not associated
351 with men and women's own sexual desire, arousal, orgasm, and satisfaction, for women, it was
352 associated with their partner's lower sexual arousal. Lastly, for men and women, infertility-
353 related relational stressors were associated with their own lower sexual arousal and satisfaction,
354 as well as with their partner's lower sexual satisfaction. For women, experiencing greater
355 relational stressors was also associated with their own lower sexual desire and orgasm.

356 **Discussion**

357 The aim of this cross-sectional dyadic study was to provide a better understanding of the
358 infertility-related personal (emotional, mind-body) and relational stressors associated with
359 different domains of sexual function as well as sexual satisfaction in couples seeking ART. Our
360 findings revealed that both infertility-related personal and relational stressors were associated
361 with individuals' own and/or their partner's poorer sexual health.

362 **Infertility-Related Personal Stressors**

363 Our results confirm the expected associations between infertility-related emotional
364 stressors and men and women's own lower sexual desire. Prior research suggests that the
365 emotional burden of infertility may be more challenging than the physical burden associated with
366 infertility⁷⁵ and its treatments,⁷⁶ and may have a significant influence on the decision to stop
367 treatment.⁷⁷ Our results, therefore, support the idea that the emotional impact of infertility may be
368 more strenuous on couples' quality of life and corroborate other studies' findings that it is
369 associated negatively with domains of sexual function.^{33,62}

370 Indeed, infertility has been associated with a significant range of emotions including
371 sadness, shame, guilt, failure, incompetence, loss, and disappointment.^{33,78,79} Consequently,

372 couples seeking ART have been found to experience high rates of emotional distress and
373 depressive symptoms,⁸⁰ which are associated with more difficulties in sexual function.^{33,81} Sexual
374 desire itself has been considered as a “subjective feeling state”⁸² and an “emotional
375 experience”.⁸³ It is therefore not surprising that this domain of sexual function would be most
376 affected by couples’ emotional state related to infertility. Experiencing negative emotions could
377 hinder couples’ ability to access and connect with positive emotions such as sexual desire. It is
378 also possible that the negative emotions couples experienced were more difficult to understand
379 and regulate than the mind-body stressors. The mind-body stressors refer to more concrete
380 consequences of infertility and treatment (e.g., fatigue, pain, disruption to daily activities),⁶⁸ and
381 their association with sexuality may be more distal than the overwhelming negative emotions that
382 often accompany the experience of infertility and treatment. It should be noted however, that the
383 emotional and mind-body subscales of the FertiQol are highly correlated and are considered to
384 have some conceptual overlap (e.g., impact on day-to-day activities).⁸⁴ Therefore, it is possible
385 that the emotional subscale has taken up most of the variance and smaller effects of the mind-
386 body stressors on couples’ sexuality have been obscured.

387 Our results did not reveal significant associations between infertility-related emotional
388 stressors and individuals’ own sexual arousal, orgasm and satisfaction, which suggests that the
389 emotional impact of infertility may be more strongly associated with couples’ interest and drive
390 to engage in sexual activities. Indeed, as we expected, we found that for both men and women,
391 infertility-related emotional stressors were also associated with their partner’s lower sexual
392 desire. The association between infertility-related emotional stressors and both partners’ sexual
393 desire suggests that when one partner experiences intense emotions related to infertility, this
394 could potentially hinder the sexual desire of both partners. Hence, emotional stressors may take
395 up most of the space within the couple, making it difficult for both partners to develop a desire to

396 engage in sexual activity. This is consistent with the Interpersonal Emotion Regulation Model of
397 sexual dysfunction⁶³, which posits that difficulties in emotion regulation, including emotional
398 awareness, expression, and experience may negatively affect couples' sexual functioning. If
399 couples are still able to engage in sexual activities and to cope with the feeling of lower sexual
400 desire, our findings suggest however, that other domains of sexual function and sexual
401 satisfaction may not be as impacted by the negative emotions, and cognitive and physical burdens
402 experienced due to infertility and its treatment.

403 For women, experiencing infertility-related emotional stressors was also associated with
404 their partner's lower sexual satisfaction. Additionally, for women, experiencing infertility-related
405 mind-body stressors was associated with their partner's sexual arousal. Our findings extend
406 previous research, which has focused primarily on individual effects, by offering a dyadic
407 understanding of the sexual health of couples seeking ART. Individuals who experience negative
408 emotions, including depressive affect, are also more likely to view not only themselves, but also
409 their partners through a negative lens. These negative perceptions may then result in the
410 individual engaging in negative communication behaviors,⁸⁵ and may exacerbate both their own
411 as well as their partner's sexual difficulties.⁸⁶ Given that having children is a goal shared by both
412 members of the couple, witnessing disturbances in one's partner's emotional well-being due to
413 infertility may be difficult to cope with for men, who may feel a sense of guilt, anger, and
414 helplessness, which, in turn, may affect their sexual arousal and satisfaction.⁸⁷

415 While it has been shown that the emotional burden of infertility and treatment can
416 significantly affect both partners, studies have suggested that women generally experience higher
417 distress, including anxiety, depression, cognitive disturbances, stress and self-esteem difficulties
418 than their male partners.⁸⁸ Experiencing higher levels of distress, which is likely to be more
419 apparent and to affect one's partner, may also explain why women's infertility-related emotional

420 and mind-body stressors may be significantly associated with their partner's lower sexual
421 satisfaction and arousal. Moreover, women coping with infertility have been found to disclose
422 their feelings more often than their partners,⁵⁸ which could therefore lead to further concern in
423 their partner and thus further impact the partner's sexual function. These hypotheses remain
424 speculative, however, and future studies are needed to examine potential mediators of the
425 association between individuals' personal stressors and their partner's sexual health.

426 **Infertility-Related Relational Stressors**

427 We have found that infertility-related relational stressors were significantly associated
428 with each partner's own lower sexual arousal and satisfaction. These results support our
429 hypothesis and are consistent with previous studies that found significant associations between
430 relationship concerns and lower sexual health in couples seeking ART.⁵⁸ Our findings are also in
431 line with previous research showing that couples who experience relationship problems and
432 distress often report lower sexual desire and problems with arousal and orgasm,⁸⁹ highlighting
433 that couples reporting increased problems or conflicts within their relationships are less likely to
434 want to engage in sexual activity with their partner.⁸⁹ Lower dyadic adjustment, communication,
435 support, relationship satisfaction and intimacy have also been related to lower sexual satisfaction
436 in clinical and non-clinical populations.⁹⁰

437 Infertility and treatment can have a negative impact on partners' communication, ability
438 to support each other, relationship satisfaction and perceived intimacy,^{49,51,58,68} domains included
439 in the relational stressors measure used in the present study. In our study, those who perceived
440 such negative impacts of infertility and treatment on their relationship also reported lower sexual
441 satisfaction. Indeed, intimacy and sexual intimacy are considered to be interrelated, both
442 incorporating sexual and nonsexual expressions of affection, physical closeness, open
443 communication and partner responsiveness.⁹¹ Given the private nature of infertility and its close

444 link with sexuality, couples tend to rely primarily on each other for support and may isolate from
445 others, which could potentially put additional pressure on the relationship and result in increased
446 tension,⁴² and lower perceived intimacy,⁵⁸ affection,⁶⁰ and satisfaction⁵¹ within relationships, and
447 could possibly also negatively influence their sexual function and sexual satisfaction.⁹²

448 For women, experiencing greater relational stressors was also associated with their own
449 lower sexual desire and orgasm. Since women tend to express a stronger desire to have a baby⁹³
450 and to experience higher emotional distress than men in the context of infertility,^{88,94}
451 experiencing greater relational stressors could potentially further threaten women's desire to
452 conceive, exacerbate their worries regarding infertility and their relationship, as well as their
453 emotional well-being and regulation. As suggested by Rosen and Bergeron,⁶³ the influence of
454 interpersonal stressors on individuals' emotional regulation can in turn, affect their sexual well-
455 being. Therefore, for women coping with infertility, it could understandably be associated with
456 further disturbances in other domains of sexual function, beyond sexual satisfaction, such as
457 problems with sexual desire and orgasm. These findings thus highlight that factors related to the
458 couple's relationship seem to significantly account for disruptions in both women's and men's
459 own sexual function and satisfaction.

460 Our analyses revealed that individuals' infertility-related relational stressors were also
461 associated with their partner's lower sexual satisfaction, highlighting the importance of paying
462 attention to the relational context surrounding the sexual experiences of couples seeking ART.
463 Little is known about the reciprocal effects of relational stressors on each partner's sexuality in
464 the context of infertility. However, in fertile populations, individuals' lower dyadic adjustment
465 and relationship happiness have been associated with their own and their partner's lower sexual
466 satisfaction.^{63,95,96} Levels of sexual and nonsexual communication⁹⁶ and perceived partner
467 responsiveness⁹⁷ have been suggested to mediate the association between relationship and sexual

468 satisfaction. Further research on potential mediators of the association between infertility-related
469 relational stressors and partners' sexual satisfaction is warranted.

470 Interestingly, individuals' own relational stressors were not associated with their partners'
471 sexual function in our study. This finding suggests that perhaps, in the context of infertility,
472 individuals' own personal stressors (emotional and mind-body) may play a more significant role
473 in their partner's sexual function. Gana and Jakubowska⁹⁸ have found that the intrapersonal
474 sphere seems to be more vulnerable to the deleterious effects of infertility stress than the dyadic
475 sphere. Thus, it is possible that overall, partners were more sensitive to the emotional and mind-
476 body well-being of their significant other, which could have a negative effect on their own sexual
477 function.

478 **Strengths, Limitations and Future Directions**

479 This study included a large sample of couples and highlighted the necessity of applying a
480 dyadic approach to research on the sexuality of couples seeking ART. Moreover, our sample was
481 relatively heterogeneous with respect to couples' cause of infertility and treatment stage.
482 Validated measures of sexual function were used to limit measurement bias. Additionally, the use
483 of a measure designed for individuals with infertility allowed us to better capture personal and
484 relational stressors specific to couples seeking ART. While this study explored risk factors that
485 may be associated with lower sexual function and satisfaction, it would be valuable to explore
486 dyadic protective factors, such as dyadic coping, intimacy, and partner support, that could
487 promote better sexual health among couples seeking ART. Moreover, our findings highlight the
488 importance of exploring different domains of sexual function and sexual satisfaction, given that
489 they may be impacted differently in the context of infertility.

490 This study presents some limitations. Given the cross-sectional design of the study,
491 causality between infertility-related factors and couples' sexual function and satisfaction cannot

492 be inferred. For instance, it is possible that lower sexual function and satisfaction may lead to
493 more infertility-related stressors. A longitudinal design would allow for the examination of
494 trajectories of change over time regarding the sexual health of couples seeking ART and potential
495 predictors of these trajectories. Our sample included primarily White individuals with a high
496 level of education, which may reduce the generalizability of our findings. Since our results relied
497 on self-report data, they could be influenced by common-method variance bias and social
498 desirability, especially given the sensitive nature of sexuality. However, these biases would not
499 explain the partner effects observed. Lastly, the measures of sexual function and satisfaction used
500 in this study are only valid for couples who were sexually active in the previous 4 weeks. Future
501 studies should include measures that do not rely on a specific frequency of sexual activity in
502 order to be more inclusive of couples who may experience more significant deteriorations in their
503 sexual health and avoid sexual relations.

504 **Conclusion**

505 Our findings underscore that infertility is a couple's issue, affecting both members as a
506 unit⁴² and suggest that couples' subjective experience of infertility may be strongly associated
507 with their sexual function and satisfaction. Thus, particular attention should be paid to the
508 psychosocial burden of infertility on couples' sexuality from an empirical and clinical
509 perspective. Clinically, these results are encouraging since, unlike medical factors on which
510 couples have little control, couples may seek help with personal and relational stressors in the
511 hopes of improving their sexual relationships.

512 Findings may inform clinical interventions for couples seeking ART, which often
513 overlook sexuality as an area of concern. Given that couples faced with infertility generally
514 refrain from disclosing their sexual difficulties,⁹⁹ it is essential for clinicians to assess sexual
515 function and satisfaction in the clinical management of couples seeking ART. As emphasized by

516 Brotto et al.,⁶¹ this is important during all phases of fertility diagnosis and should include both
517 partners. A focus on interventions addressing the emotional, mind-body, and relational spheres
518 may help facilitate improvements in sexual health and better serve the needs of couples going
519 through the challenging experience of infertility and its treatment.

520

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