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Psychological effect of COVID-19 pandemic among women undergoing infertility care, a French cohort – PsyCovART

Psychological effect of COVID-19 : PsyCovART

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1 **Abstract**

2 **Purpose:** To assess psychological state of women who experienced postponement of ART care
3 during the first COVID-19 wave in a French public ward of reproductive medicine.

4 **Methods:** An online anonymous survey was emailed between July and August 2020 to all women
5 whose infertility care, including the first consultation for infertility, have been delayed at the
6 beginning of the COVID-19 pandemic. Anxiety, depression, and stress were assessed using Hospital
7 Anxiety and Depression Scale (HADS) and Perceived Stress Scale (PSS-10). Feelings about
8 COVID-19 outbreak, lockdown and suspension of fertility care were assessed by Multiple-Choice
9 Questions and Visual Analog Scales.

10 **Results:** 435 women answered to the survey (response rate 34.6%). Mean levels of the HADS-A
11 (anxiety), HADS-D (depression) and PSS10 were respectively 7.58(\pm 3.85), 4.51(\pm 3.48), and
12 27(\pm 6.75). Prevalence of stress was 50.8% and almost half of women presented clear or suggestive
13 anxiety symptoms (respectively 21.6% and 25.7%). Stress and anxiety rates were much higher than
14 those expected in infertile population. Increased stress was observed in women above 35 years and
15 those stopped 'in cycle' or during pre-treatment for in-vitro fertilization or frozen embryo transfer.
16 Patient with history of depression or anxiety had a higher prevalence of perceived stress ($p= 0.0006$).
17 Postponement was perceived as 'unbearable' for women experiencing stress ($p=0.0032$). After the
18 first wave of pandemic, pregnancy desire remained the same and 84.3% of women wanted to resume
19 fertility care as soon as possible.

20 **Conclusion:** Stopping fertility care during the COVID-19 pandemic had a significant psychological
21 impact on women with an increase of stress, and anxiety. Psychological counseling should always
22 be offered especially during this difficult period.

23

24 **Trial registration:**

25 ClinicalTrials.gov NCT04496869 on 15th of June 2020. Clinical research and innovation department
26 of HCL (Hospices Civils de Lyon) and regional Personal Protection Committee (CPP) approved the

27 study on 30th of June 2020 (Ref: 2020-A01760-39).

28 **Keywords**

29 Anxiety, Stress, COVID-19, Infertility, ART, Psychological effect, Mental health,

30

31 **Declarations**

32 Authors reported no potential conflict of interest

33 *Introduction*

34 At the end of December 2019, a new disease emerged in China named the 2019-coronavirus disease
35 (COVID-19) (1). This disease due to a severe acute respiratory coronavirus 2 (SARS-CoV-2) was
36 highly contagious. It spread out in the entire world in a few weeks. On March 11th, 2020, the World
37 Health Organization (WHO) declared COVID-19 outbreak a pandemic (2).

38 In France, during the first wave, 90 778 patients infected with COVID-19 were hospitalized with
39 19% of them requiring intensive care (3). Therefore, intensive care units were overwhelmed with a
40 lack of bed, equipment, paramedical and medical staff. To limit the strain on the health care system,
41 French authorities set up containment and delayed non-emergency care (4).

42 According to stress and coping theory, stress reaction results from an imbalance between the
43 perception of a threat and the ability to cope with it (5). People facing disasters generally experienced
44 more stress than usual however are often able to show resilience and finally recover. Some groups
45 could be more vulnerable than others to the psychosocial effects of pandemics (6). Early
46 epidemiological studies related to COVID-19 pandemic indicate a psychological impact in general
47 population all around the world (7–14). Isolation, the fear of being contaminated and the absence of
48 perspective increased stress and anxiety.

49 In France, one in eight couples encounters difficulties to conceive (15). The diagnosis and treatments
50 of infertility with uncertain results is often felt as a burden (16). Infertile couples are at risk of
51 psychosocial problems, especially anxiety and depression (17–20). These symptoms appear to be
52 higher than in general population (21) and women are more exposed than men (17,19,20).

53 Following the recommendations of the European Society of Human Reproduction and Embryology
54 (ESHRE) (22), the Biomedicine Agency (Agence de la Biomédecine) and the American Society for
55 Reproductive Medicine (ASRM) (23), infertility treatments suddenly stopped all around the world
56 although infertility is recognized by the WHO as a ‘disease’ for which the ‘time variable is critical’
57 (24). Main recommendations included suspension of new fertility treatments –ovulation induction,
58 intrauterine insemination (IUI), and in vitro fertilization (IVF)– as well as non-urgent gamete

59 cryopreservation, cancellation of all embryo transfers, whether fresh or frozen. Moreover, elective
60 surgery and non-urgent diagnostic procedures were postponed.

61 With COVID-19 pandemic and suspension of Assisted Reproductive Treatments (ART), it is highly
62 likely that psychic symptoms of anxiety, stress and depression may have appeared or worsened in
63 women waiting for their first infertility consultation or undergoing infertility treatment.

64 In *Turocy et al.*, cancellation of fertility treatment upset infertile couples (25). Regarding the
65 COVID-19 studies, in different countries, an increase of emotional distress and anxiety were found
66 in infertile couple (26,27), especially in women (28).

67 The aim of the study was to assess psychological state of women who experienced postponement of
68 ART care during the first COVID-19 wave in one of the largest French public ART centers.

69 ***Materials and Methods***

70 *Study Design*

71 This cross-sectional study was performed in a French public Reproductive Center at the ‘Femme,
72 Mère, Enfant’ Hospital (HFME). An online survey was e-mailed to the participants from a dedicated
73 mailing box. Women treated for infertility were recruited if they had consultation, surgery or ART
74 treatment delayed due to the COVID-19 pandemic. Survey was completely anonymous and
75 voluntary.

76 HADS and PSS-10 scales were used to assess anxiety, depression, and stress.

77 *Survey characteristic*

78 Survey was developed by a team of gynecologist and psychologists.

79 There were three main sections: 1) questions related to demography, socioeconomic situation,
80 fertility history, mental health history and specific feelings related to the COVID-19 pandemic, 2)
81 Hospital Anxiety and Depression Scale (HADS) questionnaire for anxiety and depression
82 assessment, 3) Perceived Stress Scale (PSS-10) questionnaire for stress assessment. Both scales are
83 worldwide validated, with a French version and used in recent ART and COVID19’s research (29–
84 33). Clinical translation of HADS and PSS-10 scores are resume in Table 1.

85 *Patient background:*

86 Demographic variables including age, marital status, work status, number of children, anxiety or
87 depression history and treatment were asked. Specific items related to ART were added: infertility
88 duration, length of fertility cares, previous ART treatment. We asked for the feeling about stopping
89 ART care, fear of being pregnant during outbreak, desire of pregnancy and starting again ART
90 procedure. Regarding COVID-19, we asked some specific questions: “Did the news about COVID-
91 19 in the media increase anxiety?”, “Did the COVID-19 pandemic prevent you from seeing your
92 doctor/ going to the hospital?”, “How did you assess your stress compared to the period before the
93 lockdown?”, “At what step of ART procedure were you at the beginning of lockdown?” “Did you
94 personally think about stopping ART treatment during the outbreak?”, “Did you experience any

95 mood change during lockdown?”, “Did you notice any change within your relationship during the
96 lockdown?”. It was assessed either with visual analog scales (VAS) (1 to 10 / -5 to 5) or MCQ.

97 *HADS Scale:*

98 Hospital Anxiety and Depression Scale is a 14 items scale, assessing separately anxiety (7 items)
99 and depression (7 items). All items were scored on a four-point Likert scale ranging from 0 to 3. It
100 results in a score of 0 to 21 for both anxiety and depression. The subscales, anxiety (HADS-A) and
101 depression (HADS-D), were independent measures. Score of 0 to 7 was regarded as normal range,
102 score of 11 or higher indicates probable presence of mood disorder and score of 8 to 10 was
103 suggestive. Despite the word ‘hospital’, HADS was validated in community setting.

104 *PSS-10 scale:*

105 Perceived Stress Scale (PSS-10) was a 10 items scale, graded on a five-point (0-4) Likert scale,
106 examining participant’s level of perceived stress over the last month. Four items (4, 5, 7, and 8) were
107 positively stated items and require reverse coding. Total score was between 0 and 40. Score ranging
108 from 0-13 would be considered low stress, 14-26 moderate stress, 27-40 high perceived stress.

109

110 *Recruitments*

111 Women who had consultation (face-to-face, remote, scheduled or canceled) between 1st of January
112 et 11th of May 2020 were contacted. Email addresses were found in the ART software used in the
113 department. Online survey was sent between July and August, to 1300 women.

114 Inclusion criteria were age between 18 and 42 years and 12 months, all causes of infertility.
115 Exclusion criteria were non-French speakers or readers, no email address found in the medical file,
116 need for oocyte donation or fertility preservation. We chose to exclude oocyte donation and fertility
117 preservation patients because these journeys engage other specific psychic process.

118 All the women received a consent form and gave their agreement to use the survey data. Clinical
119 research and innovation department of HCL (Hospices Civils de Lyon) and regional Personal
120 Protection Committee (CPP) approved the study on 30th of June 2020 (Ref: 2020-A01760-39). The
121 trial was registered in ClinicalTrials.gov (NCT04496869).

122 Objectives

123 The aim of the study was to understand psychological response among women who had infertility
124 care, including the first consultation for infertility, postponed because of the COVID-19 pandemic
125 and the need of psychological counseling. We also wanted to assess anxiety and depression with
126 already known scales in infertile women.

127 Statistical analysis

128 The quantitative variables were described using the mean and the standard deviation or using the
129 quartiles and the minimum and maximum values, depending on the shape of the distribution. The
130 qualitative variables were described using the number and percentage in each category.

131 Patients' characteristics were compared between the PPS10 stress <27 and the PPS10 stress ≥ 27
132 using Student t-test or Mann-Whitney according to the distribution for quantitative characteristics
133 and chi-square test or Fisher exact test for qualitative characteristics with a two-sided significance
134 level of 5%. No comparisons were performed for the HADS scale.

135 All statistical analyses were performed using SAS® Software version 9.4 in a Windows
136 environment.

137 **Results**

138 One thousand and three hundred emails with survey links were sent. Thirty-eight email addresses
139 were wrong, and four women were excluded before answering survey (ART treatment stopped,
140 pregnancy before the lock down, fertility preservation). Finally, 435 women completed the survey
141 and 14 were excluded (oocyte donation). The response rate was 34.6% (n = 435/1258) (Figure1).

142 Mean age of the participant was 34 years (± 4.6). More than half of the participants were married
143 (53.2%). One quarter of participants already had children with their current partner. In our
144 population, mean duration of infertility was 4.8 years (± 3.1) and mean time before consulting for
145 infertility care was 2 years (± 1.9). Two-thirds of the participants were in the middle of IVF treatment,
146 or frozen embryo transfer (FET) (n= 262 / 62.2%), 28 ovulation inductions (clomiphene citate or
147 gonadotrophin) (6.7%), 36 intrauterine inseminations (8.6%) and 91 women were not undergoing
148 any treatment (22.6%). All the participants experienced the sudden stop of ART care on 16th March
149 2020. Some women were “in-cycle”, and decision was made to perform oocytes pick up and froze
150 all embryos (18.5%). Ovulation stimulation (9.5%) IVF and FET pretreatments (19.9%) were
151 stopped. Some of them were between two consultations (45.6%), other were waiting for the first
152 fertility appointment (6.4%) (Table 2).

153 Anxiety and depression history in our population was 21.1% (n=89). Thirty-nine (43.8%) of them
154 were treated by anxiolytics and 38 (42.7%) by antidepressants. The majority experienced
155 psychological counseling (n=54 – 60.7%) and 20.2% (n=18) alternative medicine.

156 Thirty spontaneous pregnancies were reported during the lockdown (7.1%).

157 Mean levels of the HADS-A (anxiety), HADS-D (depression) and PSS10 were respectively 7.58 (\pm
158 3.85), 4.51 (± 3.48), and 27 (± 6.75) (Table3). Presence of stress was clearly identified in 50.8% of
159 our patients (PSS10 \geq 27: n=214). Anxiety also seemed to be present with 21.6% of symptomatic
160 women and 25.6% with suggestive symptoms. No tendency to depression was found.

161 Among the patients, only 112 (26.6%) imagined suspending ART procedures for themselves.

162 Suspension of ART care during the lockdown felt logical for 45.8% of them and surmountable for

163 27.3%. It was unbearable for a significant part (n=85 – 20.2%). Most of the women wanted to
164 resume treatments as soon as possible (n=355 – 84,3%). Desir of pregnancy did not decrease, and
165 patients did not seem to be afraid of getting pregnant during the COVID-19 pandemic (Table 4).
166 Women reported that they did not feel more stressed during lockdown, while they experienced mood
167 changes and 18,3 % noticed changes in their relationship. COVID-19 media news appeared to be
168 worrisome, and fear of COVID-19 seemed to prevent them from going to hospital (Table 5).

169 Stress and anxiety were assessed according to sociodemographic and clinical characteristics of the
170 sample. Results are presented in Table 6 and 7.
171 Previous parity, infertility duration, desir of pregnancy did not have a significative impact on the
172 prevalence of anxiety or stress. However, women stopped ‘in cycle’ or during pre-treatment for IVF
173 or FET seemed to be more stressed, as well as women over 35 years old and those who consulted
174 earlier for difficulty getting pregnant (not statistically significant).
175 Patient with an history of depression or anxiety had a higher prevalence of percieved stress (75.3%
176 vs. 44.3%, p=0.0006).
177 Concerning emotional aspect, postponement was significantly more likely to be perceived as
178 ‘unberable’ by women under stress (67.1% vs. 32.9%, p=0.0032). While women without
179 psychological distress were more prone to consider it as ‘logical’ (60.6% vs. 39.4% p=0.0006).

180 **Discussion**

181 To our knowledge, this is the first study assessing the psychological effect of COVID-19 pandemic
182 among a whole population of infertile women by using standardized survey. This study revealed that
183 COVID-19 pandemic had a psychological impact with a clear prevalence of stress. Fifty percent of
184 women had a PSS-10 score above 27 classifying them directly with a symptomatic mood disorder.
185 Almost half of the women presented clear or suggestive symptoms of anxiety (respectively 21.6%
186 and 25.7%). Compared to those usually expected in infertile population, stress and anxiety rates were
187 higher.

188 Validated scales, either in general or infertile population, were used in this study. Lesage *et al.*
189 assessed PSS-10 in a French cohort, finding a woman mean score of 15.9 +/- 6.7 with no difference
190 related to parental or marital status (31). In another study, same scores were found in women
191 attempting to conceive outside of any fertility investigations (PSS :14.8 -17.8) (32). Concerning
192 HADS scale: women scores were respectively 6,6 and 3,5 for HADS-A and HADS-D in a group of
193 French workers (34). Similar scores were found in a population of infertile women attempting for
194 IVF (HADS-A=6,8 – HADS-D=3) (29). In both scale (HADS and PSS10), items were balanced with
195 positive and negative statements to minimize the response set effect. Comparatively to our finding,
196 these scores confirmed an increase of stress in our cohort and a tendency towards anxiety during this
197 period. Moreover, in a meta-analysis conducted in 2020, authors established the rate of anxiety at
198 36.17% in infertile women, based on 13 international publications (35). This rate was greater than
199 the prevalence of this condition in a general and healthy women population (36). In comparison, in
200 the departement, prevalence of stress was 50.8% and the tendency to anxiety was 47.2 %. These high
201 rates support the idea that suspension of ART care increased the psychological consequences of
202 infertility.

203 Interviewing only women was a deliberate choice, because they are known to be more vulnerable.
204 Indeed, the unability to conceive is often a topic of discussion within family and among friends.
205 Social pressure about parenthood remains mainly on women's shoulders. Previous investigations
206 indicated a difference in prevalence of psychological disorders within the couple, with women

207 psychologically more affected than men by the burden of infertility (17,37,38). This observation was
208 also found in the latest studies about ART during the COVID-19 pandemic. Indeed, emotional
209 distress, anxiety and depression were more observed among women. As a consequence they feel
210 more concerned within the couple and seem more prone to answer to psychological surveys (26,39).
211 This might be explained by the weight of fertility treatments often injectable and usually with side
212 effects like mood disorders, asthenia, nausea, weight gain or ovarian hyperstimulation syndrome
213 (40). These tedious protocols are given to all women, regardless the origin of infertility. Moreover,
214 uncertainty about whether it will be successful or not increase the distress of these women. It was
215 already shown that women who felt to have a poor control over the course of their fertility problem
216 displayed higher levels of stress and anxiety (41). Boivin *et al.* reported that women also suffered
217 from the fact that their medical care was not considered essential and therefore, find their condition
218 denigrated and minimized (39).

219 It must be underlined that psychological distress highlighted in this study could be due to multiple
220 causes. Part of stress due to the pandemic and the one due to the closure of fertility center are difficult
221 to assess. Containment measures, including self-isolation and social distancing, had a strong impact
222 on population's daily life and may have negatively affected psychological well-being (42). Surveys
223 on COVID-19 have been recently conducted in general population in Italy (7), Spain (8), France (10)
224 and China (11,12,14). Those have shown an increase in psychological issue because of the COVID-
225 19 pandemic. However, it is noteworthy that it did not reach a pathological level. As reported by *Qiu*
226 *et al.*: only 5% of the population suffered from severe distress and 29% from mild or moderate
227 distress (12). Therefore, the symptomatic level of psychological disorder reported in this study seems
228 to be, even more, in connection with the interruption of ART.

229 According to the characteristics of the population, a higher rate of stress seemed to be observed
230 among women whose treatment was stopped before oocyte retrieval or embryo transfer. The sudden
231 stop was experienced as a lost chance and a failure of treatment, which did not lead to the expected
232 result: pregnancy. Previous treatment failures are known to be an important element reducing the
233 ability to cope and thus increasing stress (43). Stress symptoms were also more frequent in patient

234 above 35 years old. Same trend was found in infertile Turkish women (28). Advanced maternal age
235 is known to have a significant impact on reproductive outcomes with the physiological decrease of
236 ovarian reserve over time. Women above 35 years old might be more concerned about the diminished
237 chances of pregnancy. This is consistent with Tokgoz *et al.* results which showed that women with
238 a diminished ovarian reserve had a higher level of anxiety during the outbreak (28). 21% of the
239 participant had an history of anxiety or depression before the outbreak. It was a normal rate for an
240 infertile women population (35). As expected, this subgroup of women significantly experienced
241 more stress (PSS score >27 for 75.3% of them). Women who had consulted earlier for infertility also
242 appeared to be more prone to stress during the pandemic. For both groups, imbalance between the
243 perception of the threat (stopping treatment) and the personal resources to cope with (pre-existing
244 psychological vulnerability) leads to a stress reaction.

245 One in four women had spontaneously thought of stopping ART care because of the pandemic. This
246 concern about fertility and getting pregnant despite the pandemic is not specific to our sample.
247 Vaughan *et al.* pointed out that infertility remained a top stressor in America, before the COVID-19
248 during the first wave (44). For half of the women, stopping ART care was acceptable. However, for
249 20% of them, it was felt to be unbearable. COVID-19 became an additional burden on top of what
250 patients had already experienced due to infertility or past disappointment (miscarriage, treatment
251 failures).

252 The first aim of ART ward closure was to limit the spread of the disease (by bringing people to
253 hospital), to avoid additional stress on healthcare systems and free some needs (human and material
254 redeployment) to help in COVID centers (39). Secondly, stopping ART care seemed to be necessary
255 because of uncertain effects of COVID on fertility (45,46), pregnancy and newborn's health (47–49)
256 at the beginning of the pandemic. It was therefore, understood by most of the patients.

257 Nevertheless, women were not afraid of getting pregnant and 84.3 % wanted to resume treatments
258 as soon as possible. This is slightly more than in the US and Italy where respectively 52% and 64%
259 of the patients indicated that they would have chosen to resume an IVF cycle despite the pandemic
260 (25,26).

261 The spontaneous pregnancy rate during this period reflected that desire for parenthood was still there.
262 In addition, lockdown allowed couple to spend more time together at home. Some patients reported
263 positive changes in their relationship, with better communication, greater complicity, and increased
264 libido. Others experienced a deterioration in relationships. Most of them reported tension related to
265 confinement and the appearance of unusual behavior (stress, irritability, moroseness) in their partner.
266 Having marital tension and a stressed partner contributes to increased women psychological distress
267 (27,43). This may have contributed to intensify stress in this group.

268 The media were also identified as a source of anxiety and stress by women. Like our research, Barra
269 *et al.* demonstrated that the occurrence of stress or anxiety feeling was associated with the time per
270 day spent on COVID-19 related news (>1h) (27). Despite this, in general population as well among
271 infertility subgroup, regular update information was perceived to be helpful in some other studies
272 (9,39).

273 Other international studies have been carried out and most of them only included women undergoing
274 IVF or IUI (26,28). From our perspective, it was important to assess state of mind of all patients
275 who received care, and particularly those waiting to start treatment. Women who underwent IVF
276 represented only 38% of the active file when the lockdown started. Focusing only on them would
277 have made us neglected most of the patients. With our results that included all women, it was obvious
278 that psychological impact of COVID-19 pandemic occurred regardless the stage of the ART care
279 process.

280 This is the first French study assessing the psychological status of women who experienced
281 postponement of ART care due to the COVID-19 pandemic. One of the strengths of this work was
282 to use standardized measures of anxiety, depression, and stress. It will allow us to repeat survey,
283 assess evolution of emotional distress and follow up of our patient. Another strength was the
284 inclusion of all consecutive women at different stages of the care process. In addition, our sample is
285 relatively large and the response rate for online survey is satisfying and consistent with same-topic
286 studies (26,28,39,44).

287 Limitations of our study include inherent constraints of self-report measures of psychological
288 distress which maybe not always aligned with assessment by mental health professionals. It is

289 possible that there was a selection bias of participants with women experiencing less anxiety and
290 stress choosing not to enroll. Due to the survey anonymity, characteristics about the non-responders
291 were not available. The urgency of this work required a quick turnaround of surveys. The absence
292 of control group is a regret but establishing a suitable one with these deadlines was complex.
293 Moreover, our results can be easily compared with the literature regarding the validated scale.
294 Another bias might be a recall bias because the survey has been done after the end of the lockdown.
295 Emotional distress may have been underestimated. Gradual return to work, increasing numbers of
296 people recovering from COVID-19 and improvement of infection knowledge gave the population
297 some confidence. The psychological distress due to quarantine could have decreased (48) as well as
298 the one due to the suspension of the infertility care (50). Another limit could be the monocentric
299 nature of the investigation, which focuses on a community in a relatively affluent urban area. The
300 incidence of COVID-19 was high in our area and healthcare system has been seriously threatened.
301 Our population might have been more aware of the pandemic severity. Participants might have
302 experienced more stress and anxiety than people in other region. Moreover, our infertility center is
303 a public hospital where ART care costs are covered. Impact of COVID-19 economic issues on our
304 patients might be minimized.

305 Our study is in line with the extensive psychological research following the COVID-19 pandemic
306 and responds to the call made by Holmes *et al* (Lancet Psychiatry): to collect collaboratively and
307 multidisciplinary data on the effect of the COVID-19 pandemic on mental health across the whole
308 population and vulnerable groups (51). Our findings help to identify some of the most sensitive
309 patients.

310 In June 2020, thanks to a partial control of the pandemic, authorities allowed the resumption of ART
311 cares. Initially with medical restrictions, then reproductive treatment resumed as before. However,
312 couples are still experiencing uncertainty about a new postponement of treatment, fear of being
313 contaminated, the risk of delaying or even interrupting again the procedure. A psychological follow-
314 up has been initiated in our ward to monitor anxiety and stress throughout the COVID-19 pandemic.
315 The mood impact of the closure of ART centers will be reassessed with new surveys and with the

316 aim of identifying protective and resilience factors to offer an optimal counselling strategy. More
317 than ever, psychological counseling must be offered to the patient in all reproductive medicine
318 department.

319 ***Conclusion***

320 COVID-19 pandemic was an unprecedented situation which have changed daily life and future
321 perspective.

322 According to this study, stopping ART treatments during COVID-19 lockdown contributed to
323 increase stress and anxiety. Women aged over 35 years old and those whose treatment was
324 interrupted before oocyte puncture or embryo transfer seemed to have a higher rate of psychological
325 distress. Despite the lack of knowledge about the COVID-19 and the consequences on pregnancy
326 and fetus wellbeing at the time of the survey, desire of getting pregnant and starting over ART
327 treatments clearly showed up.

328 Psychological impact of COVID-19 pandemic on infertile women must not be neglected. Specific
329 psychological counseling should be proposed to women and her partners. In the light of our findings,
330 a new suspension of ART care should be avoided, as far as possible.

331

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334 **Tables and figure**

335 Figure 1: PsyCovART flowchart

336 Table 1: Clinical signification of HADS and PSS-10 scores

337 Table 2: Characteristics of the patients

338 Table 3: HADS-A, HADS-D and PSS-10 scores among infertile women

339 Table 4: Specific questions of the survey and answers about ART care

340 Table 5: Specific questions about COVID-19 experience

341 Table 6: Comparison of PSS-10 according to sociodemographic and clinical parameters

342 Table 7: Comparison of HADS anxiety score according to sociodemographic and clinical
343 parameters

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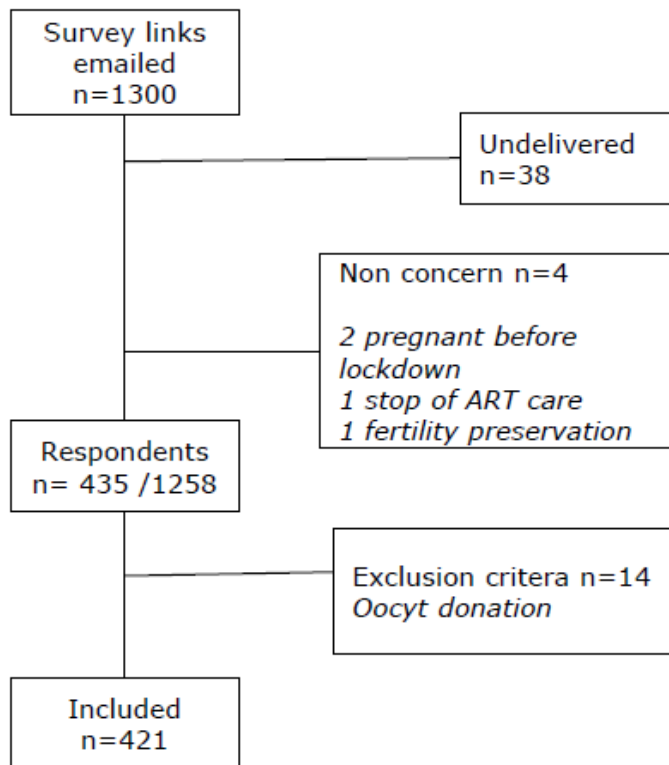


Figure 1 : PsyCovART flowchart

Figure 1: PsyCovART flowchart

Table 1: Clinical signification of HADS and PSS-10 scores

HADS : Hospital Anxiety and Depression Scale; PSS10 : Perceived Stress Scale.

HADS-Anxiety	HADS-Depression	PSS-10	Mood disorder
0-7	0-7	0-13	Absence
8-10	8-10	14-26	Suggestive/Doubtful
11-21	11-21	27-40	Presence

Table 1: Clinical signification of HADS and PSS-10 scores

Characteris	Women (n=421)
Age, years (mean±std)	34 ± 4,6
Marital statut n(%)	
Married	224 (53,2)
Common-law	197 (46,8)
Occupation during lockdown n(%)	
No	60 (14,3)
Yes	321 (76,2)
Face-to-face Work	140 (43,6)
Teleworking	148(46,1)
Other	40 (9,5)
Anxiety history n(%)	89(21,1)
Number of children n(%)	
None	318 (75,5)
With current partner	104(24,7)
One	90(87,4)
Two	9(8,7)
Three	5(4,9)
With a precedent partner	21(0,5)
Partner's child	43(10,2)
Children living at home during lockdown	
None	278(66)
One	120(28,5)
Two	17(4)
Three	6(1,4)
Infertility characteristics	
Duration of infertility, years (mean±std)	4,8 ±3,1
Time before consulting, years (mean±std)	2 ±1,9
Treatment phase n(%)	
IVF or FET	262(62,2)
Oral ovulation induction	5(1,2)
Gonadotrophine induction ovulation	23(5,5)
Intrauterine insemination	36(8,6)
No treatment	95(22,6)
Care process stage when ART was suspended n(%)	
"In-cycle"	78(18,5)
Ovulation stimulation	40(9,5)
Pre-treatment of IVF ou FET	84(19,9)
Between two consultations	192(45,6)
Waiting for the first appointment	27(6,4)

Table 2 : Characteristics of the patients

ART: Assisted Reproductive Treatment; IVF: In Vitro Fertilization ; FET: Freezing Embryo Transfer.

Table 2 : Characteristics of the patients

Table 3 : HADS-A, HADS-D and PSS10 scores among infertile women

HADS-A : Hospital Anxiety and Depression Scale - anxiety part; HADS-D : Hospital Anxiety and Depression Scale - depression part; PSS10 : Perceived Stress Scale; Std : standard deviation.

	Mean \pm Std	Mood disorder		
		Absence n(%)	Suggestive n(%)	Presence n(%)
PSS10 score	27 \pm 6,75	76 (18,1)	131 (31,1)	214 (50,8)
HADS-A score	7,58 \pm 3,85	222 (52,7)	108 (25,7)	91 (21,6)
HADS-D score	4,51 \pm 3,48			

Table 3 : HADS-A, HADS-D and PSS10 scores among infertile women

Table 4 : Specific questions of the survey and answers about ART care

Results = n(%) or median [IQR] or mean ± std

VAS : Visual Analog Scale ; MCQ: multiple-choice question.



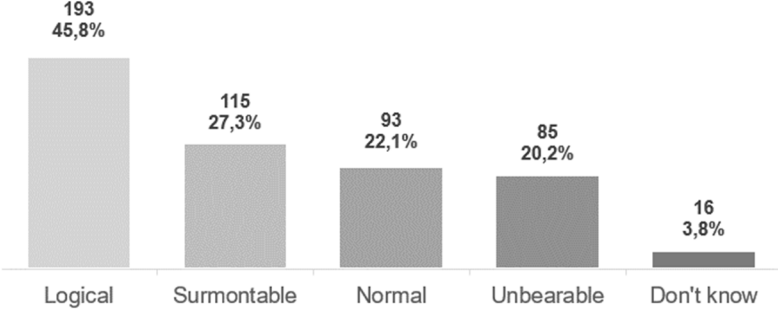

<p>Has your desire of pregnancy been exacerbated or decreased compared to the period before COVID-19? VAS -5/5</p> <p>1,3 ± 2,4</p>	<p>Were you afraid of being pregnant during the COVID-19 pandemic? VAS 1/10</p> <p>1 [1]</p>																											
<p>Have you noticed any change within your relationship during the lockdown? MCQ</p> <p style="text-align: right;">if yes, in good way 29(37,7%) if yes, in bad way 34(44,2%)</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>No</td> <td>Yes</td> </tr> <tr> <td>344</td> <td>77</td> </tr> <tr> <td>81,7%</td> <td>18,3%</td> </tr> </table>	No	Yes	344	77	81,7%	18,3%	<p>Have you personally imagine stopping ART treatment during the outbreak? MCQ</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>112</td> <td>309</td> </tr> <tr> <td>26,6%</td> <td>73,4%</td> </tr> </table>	Yes	No	112	309	26,6%	73,4%															
No	Yes																											
344	77																											
81,7%	18,3%																											
Yes	No																											
112	309																											
26,6%	73,4%																											
<p>The postponement of your ART care seemed to you : MCQ</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Logical</td> <td>Surmountable</td> <td>Normal</td> <td>Unbearable</td> <td>Don't know</td> </tr> <tr> <td>193</td> <td>115</td> <td>93</td> <td>85</td> <td>16</td> </tr> <tr> <td>45,8%</td> <td>27,3%</td> <td>22,1%</td> <td>20,2%</td> <td>3,8%</td> </tr> </table>	Logical	Surmountable	Normal	Unbearable	Don't know	193	115	93	85	16	45,8%	27,3%	22,1%	20,2%	3,8%	<p>Would you like to resume your follow-up ? MCQ</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Yes, as soon as possible</td> <td>Yes, in a while</td> <td>Not Yet</td> <td>Don't know</td> </tr> <tr> <td>355</td> <td>20</td> <td>28</td> <td>18</td> </tr> <tr> <td>84,3%</td> <td>4,7%</td> <td>6,7%</td> <td>4,3%</td> </tr> </table> <p>■ Yes, as soon as possible ■ Yes, in a while ■ Not Yet ■ Don't know</p>	Yes, as soon as possible	Yes, in a while	Not Yet	Don't know	355	20	28	18	84,3%	4,7%	6,7%	4,3%
Logical	Surmountable	Normal	Unbearable	Don't know																								
193	115	93	85	16																								
45,8%	27,3%	22,1%	20,2%	3,8%																								
Yes, as soon as possible	Yes, in a while	Not Yet	Don't know																									
355	20	28	18																									
84,3%	4,7%	6,7%	4,3%																									

Table 4 : Specific questions of the survey and answers about ART care

Table 5 : Specific questions about COVID-19 experience*VAS: visual analog scale; std: standard deviation.*

	VAS	Mean±std
How do you assess your stress compared to the period before the lockdown?	-5/5	0,8 ± 2,1
Have you experienced any mood change during lockdown?	1/10	4,1 ± 3
Did the COVID-19 media news seem anxious to you?	1/10	6,5 ± 2,9
Did the COVID-19 pandemic prevent you, for fear, from seeing your doctor?	1/10	2,9 ± 2,7
Did the COVID-19 pandemic prevent you, for fear, from going to hospital?	1/10	3,6 ± 3,1

Table 5 : Specific questions about COVID-19 experience

Table 6 : Comparison of PSS-10 according to sociodemographic and clinical parameters

IVF: In Vitro Fertilization ; FET: Freezing Embryo Transfer; VAS: Visual Analog Scale.

	n=421	PSS10 Stress		p
		n(%) or Mean±Std <27	≥ 27	
Age		207(49,2)	214(50,8)	
≤35 years	n=260	132 (50,8)	128 (49,2)	0,5384
> 35 years	n=161	75 (46,6)	86 (53,4)	
Infertility duration (year)		4,9±3,3	4,7±2,9	0,6029
Time before consulting in ART (year)		2,5±2,5	2,1±2,1	0,1807
Children with current partner				
Yes	n=103	53 (51,5)	50 (48,5)	0,647
Non	n= 318	154 (48,4)	164 (51,6)	
Anxiety history				
Yes	n=89	22 (24,7)	67 (75,3)	0,0006
No	n=332	185 (55,7)	147 (44,3)	
Support stage when ART stopped				
"In-cycle"	n=78	35 (44,9)	43 (55,1)	0,7129
Ovulation stimulation	n=40	19 (47,5)	21 (52,5)	
Pre-treatment of IVF/FET	n=84	38 (45,2)	46 (54,8)	
Between two consultations	n=192	101 (52,6)	91 (47,4)	
Waiting for the first appointment	n=27	14 (51,9)	13 (48,1)	
Desire of pregnancy (VAS -5/5)		1,3±2,1	1,3±2,7	
Feeling about postponement				
Logical	n=193	117 (60,6)	76 (39,4)	0,0006
Sumontable	n=115	51 (44,3)	64 (55,7)	0,3861
Unbearable	n=85	28 (32,9)	57 (67,1)	0,0032
Normal	n=93	50 (53,8)	43 (46,2)	0,473
Dont'know	n=16	4 (25)	12 (75)	0,1461
Resuming ART follow-up				
Yes, as soon as possible	n=355	174 (49)	181(51)	
Yes, in a while	n=20	10 (50)	10 (50)	
Not yet	n=28	18 (64,3)	10 (35,7)	
Don't know	n=18	5 (27,8)	13 (72,2)	

Table 6 : Comparison of PSS-10 according to sociodemographic and clinical parameters

Table 7 : Comparison of HADS anxiety score according to sociodemographic and clinical parameters

IVF: In Vitro Fertilization ; FET: Freezing Embryo Transfer; VAS: Visual Analog Scale.

	n=421	HADS anxiety n(%) or mean±std	
		<11	≥ 11
Age		330(78,4)	91(21,6)
≤35 years	n=260	202 (77,7)	58 (22,3)
> 35 years	n=161	128 (79,5)	33 (20,5)
Infertility duration (year)		4,8±3,1	4,7±3
Time before consulting in ART (year)		2,3±2,4	2,1±2,1
Children with current partner			
Yes	n=103	83 (80,6)	20 (19,4)
Non	n= 318	247 (77,7)	71 (22,3)
Anxiety history			
Yes	n=89	63 (70,8)	26 (29,2)
No	n=332	267 (80,4)	65 (19,6)
Support stage when ART stopped			
"In-cycle"	n=78	63 (80,8)	15 (19,2)
Ovulation stimulation	n=40	30(75)	10 (25)
Pre-treatment of IVF/FET	n=84	65 (77,4)	19 (22,6)
Between two consultations	n=192	150 (78,1)	42 (21,9)
Waiting for the first appointment	n=27	22 (81,5)	5 (18,5)
Desire of pregnancy (VAS -5/5)		1,2±2,3	1,6±2,9
Feeling about postponement			
Logical	n=193	164 (84,9)	29 (15,1)
Sumontable	n=115	90 (78,3)	25 (21,7)
Unbearable	n=85	56 (65,9)	29 (34,1)
Normal	n=93	78 (83,9)	15 (16,1)
Dont'know	n=16	13 (81,3)	3 (18,7)
Resuming ART follow-up			
Yes, as soon as possible	n=355	280 (78,9)	75 (21,1)
Yes, in a while	n=20	14 (70)	6 (30)
Not yet	n=28	24 (85,7)	4 (14,3)
Don't know	n=18	12 (66,6)	6 (33,3)

Table 7 : Comparison of HADS anxiety score according to sociodemographic and clinical parameters