



Resilience of the Patients to the Management of Infertility in a Low-Income Sub-Saharan Setting

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How to cite this paper: Mboloko, E., Egbolo, A., Ngoyi, K., Mampuya, I., Etana, L., Mwakila, A., Moangi, B., Mogwo, S. and Monzango, S. (2024) Resilience of the Patients to the Management of Infertility in a Low-Income Sub-Saharan Setting. *Open Access Library Journal*, **11**: e11651.

<https://doi.org/10.4236/oalib.1111651>

Received: May 5, 2024

Accepted: October 28, 2024

Published: October 31, 2024

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Abstract

Introduction: Infertility is a dramatic situation worldwide, particularly in low-income areas like the sub-Saharan Africa region, which is a pro-natalist environment. Infertility management is very demanding because the people are poor, and there is a lack of relevant medical platforms and medical insurance. The current study aimed to analyze the resilience of patients to infertility management follow-up. **Materiel and Methods:** The current study is a descriptive cross-sectional one undertaken in the University Clinics of Kinshasa and at the Edith Medical Center from January 2000 to December 2020; about 3867 patients sought care for infertility. **Results:** The age of the patients ranged from 20 to 49 years, with an average of 33.1 ± 5.7 years. Most patients were married, housewives and nulliparous, with a median follow-up time of 6 weeks. Nulliparous patients were more resilient than primiparous and multiparous patients, with the risk of dropout (OR: 1.3; 1.7, respectively). The duration of infertility of more than 5 years was associated with the reduction of the risk of dropping out by 72% [95% CI (0.14 - 0.54); $p = 0.000$]. Getting pregnant was associated with a more resilient attitude with a risk of dropout reduced by 93% [95% CI (0.03 - 0.18); $p = 0.000$]. **Conclusion:** Patients spent 6 weeks in specialist care for infertility. Nulliparity and long duration of infertility were the main factors for the resilience to specialized infertility out of IVF care in a low-income setting.

Subject Areas

Gynecology & Obstetrics

Keywords

Resilience to Infertility Care, Infertility in a Low-Income Setting,

Abandonment of Treatment, Sub-Saharan Region

1. Introduction

Infertility management in the low-income setting is a distressing situation owing to the poverty of the population who are under the pressure of society and the lack of a good technical platform. Therefore, patients need to be more resilient, which means they must be able to bear that painful situation without discontinuation of the treatment. Couple infertility, defined as the failure to conceive after a year of regular and unprotected intercourse [1], is a very delicate health problem that needs to be addressed properly.

The prevalence of infertility is around 13% worldwide and it climbs to 25% in some developing areas like the sub-Saharan region [2] [3]. It is known as pronatalist, where many social complications related to infertility arise frequently, namely stigmatization, loss of self-esteem, violence and divorce [4].

Among infertile couples, approximately 56% seek medical help. Infertility management is demanding in terms of investigations, medical and surgical treatments and the time it requires [5]. It is generally done following a pyramid of care ranging from lifestyle advice to advanced Assisted Reproductive Technology (ART), namely IVF (In Vitro Fertilization) and ICSI (Intracytoplasmic Sperm Injection) [6]. For average people in low-income areas, the management is relatively unaffordable: lab exams and invasive explorations like endoscopic and ovulation inductors are very expensive. If they go for ART, the average cost per cycle is very expensive. On the other hand, apart from the societal pressure, people are poor and medical insurance is not organized. They have to support all by themselves [7]. This is among the reasons that influence patients' attitudes: to go from one care provider to another (generalist, traditional healer and specialist) [8].

The prevalence of abandonment of treatment varies from 5.6 to 70% worldwide [9]. This situation needs investigation to understand the causes and predictive factors of dropping out. According to several studies, the psychological and financial burden of treatment, the stress associated with treatment, marital and personal problems, and social factors were the most incriminated factors [9] [10]. Owing to the lack of work facing this aspect in our setting, the aim of the current study is to highlight the factors associated with the patient's resilience, *i.e.*, the capacity of patients to stay stuck to the treatment or to abandon.

2. Material and Methods

This was a cross-sectional analytical study that took place from January 2000 to December 2020 in the University Clinics of Kinshasa and the Edith Medical Center. A total of 3867 patients who sought care for infertility were enrolled. The variables of interest were sociodemographic (the age of the patient in years, her profession, her marital status), clinical (duration of infertility in years, medical and surgical history, age of menarche, type of cycle, cycle duration in days, duration

of menstruations in days, and clinical diagnosis), paraclinical (ultrasound, hysterosalpingography and laparoscopy findings), treatment and duration of follow-up in weeks. The data were extracted from the database of the university clinics of Kinshasa and the Edith Medical Center, recorded in a Microsoft Access 13 program, and analyzed by Stata IC 18. The qualitative variables were expressed as proportions and the quantitative variables were summarized as mean and standard deviation or median with interquartile range according to the type of distribution, normal or skewed. The student's t-test was used to compare the means and the Pearson Chi Square test to compare the proportions. The Kaplan-Meier survival analysis was used to compare the time-to-abandon for patients in order to determine their resilience to infertility management and the logistic regression to determine the strength of association between the independent variables and the abandonment of the treatment. It was considered as an abandonment of treatment because the patient discontinued the treatment before the median time of all the patients: 6 weeks. The difference was statistically significant for a p-value less than 0.05. The present study received approval from the council of the Department of Gynecology and Obstetrics of the university clinics of Kinshasa. We declare no conflict of interest.

3. Results

3.1. General Characteristics of the Patients

The age of the patients ranged from 20 to 49 years, with an average of 33.1 ± 5.7 years and most (50.3%) of them were between 26 and 34 years old, followed by those over 35 (40.8%). Almost all patients (97.7%) were married and most (49.1%) were housewives. More than half of the patients (56.7%) were nulliparous and had a history of unsafe abortion. For all the patients, the median time to treatment was around six weeks (Median 6.42 weeks with Interquartile Range of 1 and 19.4 weeks).

The average duration of infertility was 4.4 ± 3.5 years and almost a quarter of patients (27.1%) had infertility for more than 5 years. Forty percent of patients had a history of pelvic surgery; among them 12% had an appendectomy and 8.3% had a myomectomy.

On ultrasound, almost a third of patients (33.7%) had a myomatous uterus and tenth (10.7%) ovarian cysts. Forty-eight percent had tubal obstructions on hysterosalpingography, and fifty-three percent had tubal obstruction on laparoscopy, with a pathological spermogram in seventy-seven percent of partners.

Most patients (63%) did not have any precise diagnosis after the two first visits and preliminary examinations. Genital infection was the main diagnosis (19.2%), followed by uterine myomas (9.9%). In almost all patients' treatments addressed tubal re-permeabilization was the most used therapeutic method (93.9%) and almost half of the patients had undergone a myomectomy associated with a cystectomy (40.5%).

3.2. Resilience According to Different Characteristics (ICI)

Patients aged 26 to 34 had an average period of 7 weeks to stay in the medical

follow-up, on the contrary ($p = 0.005$) of patients more than 34 and less than 26. Nulliparous remained in follow-up longer ($p = 0.000$) than those who already had at least one child (8 vs 5.42; 4.42 and 4 weeks respectively). The singles dropped earlier than ($p = 0.001$). The marrieds (3 vs 6 weeks). According to the duration of infertility, the median time of treatment seemed to increase steadily with the duration of infertility ($p = 0.054$). Patients with genital infection, uterine myoma and hyperprolactinemia had spent around 6.5 weeks in the medical follow up (**Table 1**).

Table 1. Analysis of follow-up time according to different characteristics.

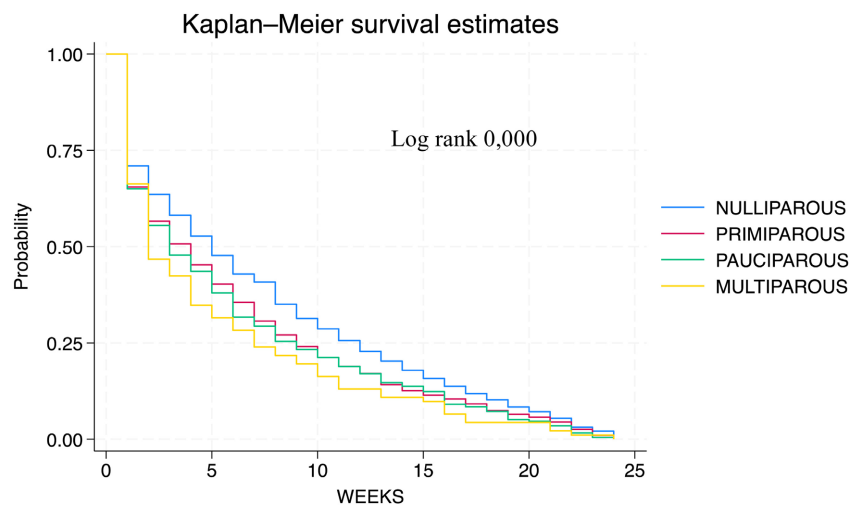
Variables	Effective	Follow-Up time		P
		Median	EQ	
Age groups (Years)				0.005
20 - 25	324	6	0.71 - 18	
26 - 34	1894	7.1	1.14 - 21.2	
35 - 49	1544	6	1.0 - 17.57	
Parity				0.000
0	2121	8	1.42 - 21	
1	846	5.42	1.0 - 17.4	
2	502	4.42	0.85 - 15.28	
4	119	4	1.0 - 21	
Marital status				0.001
Married	3479	6.5	1.14 - 19	
Single	84	3	0.57 - 8.42	
Occupation				0.700
Housewife + market gardener	590	6.5	1.42 - 21.14	
State worker	303	7.7	2 - 18.85	
Trader + agent		5.5	1 - 18	
Student		6	0.71 - 17.42	
IVG				0.280
0	1326	7.7	1.85 - 20	
1	532	7	1.28 - 18.28	
2 - 3	308	6.8	0.85 - 16.85	
>3	181	5.4	1 - 14	
Duration of infertility				0.055
1	461	6	1.14 - 19	
2	402	7.2	2.28 - 21.71	
3	312	9.14	2.0 - 22.28	
4 - 5	216	10.4	2.0 - 21.5	
>6	804	7.57	1.57 - 19	

Continued

Diagnostic				0.140
Normal	2216	7	1 - 20.5	
Infection and its consequences	681	6.71	1.42 - 18	
Myomatous uterus	399	6.28	1 - 17	
Ovarian cyst	56	5	0.71 - 21.42	
Uterine synechiae	80	11	2 - 25.5	
Sompk	2	1	1 - 0.0	
Early menopause	37	1.14	0.28 - 23.85	
Hyperprolactinemia	112	6.5	1.5 - 19	

At survival analysis, patients of all categories of age, had evolved in the same way ($p = 0.32$): half (50%) had abandoned follow-up after four weeks and three-quarters (75%) after eleven weeks. The singles had dropped earlier than married, half of them 3 weeks vs 4 for the married ($p = 0.015$).

Half of the multiparous had abandoned follow-up after 3 weeks and the nulliparous after 5 weeks ($p = 0.000$) (**Figure 1**).

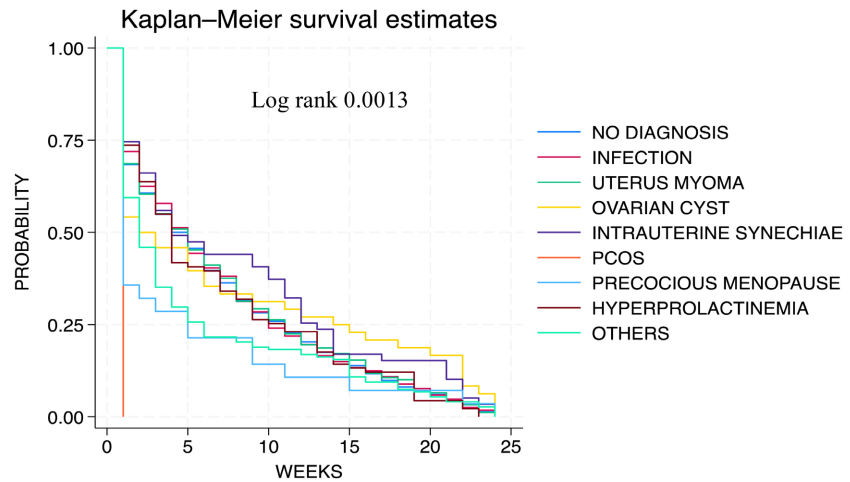


Legend: Multiparous: more than two deliveries above 28 weeks gestational age.

Figure 1. Comparison of time-to-abandon according to the parity.

Half of the patients with the diagnosis of ovarian cyst had dropped out after two weeks; those with PCOS, early menopause, hyperprolactinemia after 4 weeks and half of those with myxomatous uterus, synechiae and endometrial bone metaplasia after 5 weeks ($p = 0.0013$) (**Figure 2**).

Taking into account the success in terms of getting pregnant after the management, the patients who conceived were the ones who stayed longer in the follow up: half of them spent 14 weeks in the follow up, unlike the non-conceived whose half dropped after six weeks ($p = 0.0007$) (**Figure 3**).



Legend: INFECTION: Pelvic Inflammatory diseases and cervico-vaginitis; PCOS: Polycystic ovary syndrome, Others: appendicitis, urinary infection, Bartholinitis.

Figure 2. Comparison of time-to-abandon according to the diagnosis made.

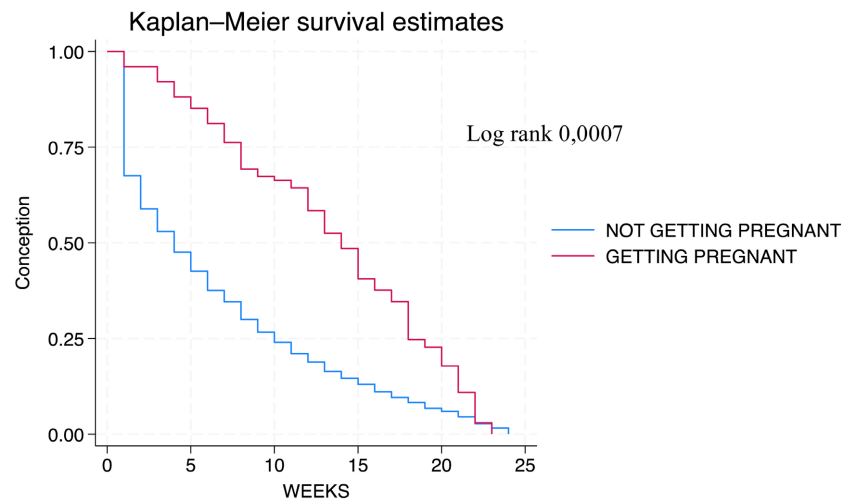


Figure 3. Comparison of the time laps of patients who conceived or not.

3.3. Factors associated with dropout

Compared to nulliparous, primiparous, pauciparous as well as multiparous women had a significantly higher risk of abandonment, respectively 1.36 [95% CI (1.16 - 1.12); $p = 0.000$], 1.71 [95% CI (1.40 - 2.08); $p = 0.000$] and 1.55 [95% CI (1.07 - 2.25); $p = 0.020$]. Singles had a 1.5 times higher risk of abandonment compared to married ($p = 0.045$). There were no statistical differences between the different professional categories in relation to the risk of abandoning treatment. Patients with a history of unsafe abortion had a 1.5-fold increased risk of abandonment compared to those who had never had unsafe abortions. Infertility durations of 3, 4 and 5 years respectively reduced the risk of abandonment by 36%, 41% and 33%, with a no statistically significant difference ($p = 0.055$).

In multivariate analysis (Table 2) and adjusted to other variables, primiparous and pauciparous had almost twice the risk of abandonment [ORa = 1.75; 95% CI

(1.15 - 2.68); $p = 0.010$), the duration of infertility of more than 5 years reduced the risk of abandonment by 72% [ORa = 0.28; 95%CI (0.14 - 0.54); $p = 0.000$] and pregnancy was associated with a 93% reduced risk of abandonment [aOR = 1.75; 95% CI (0.03 - 0.18); $p = 0.000$].

Table 2. Factors associated with abandonment of infertility care in multivariate analysis.

Variables	ORa	IC95%	P
Age (year)			
20 - 25	1		
26 - 34	1.04	[0.464 - 2.35]	0.912
35 - 49	0.76	[0.32 - 1.81]	0.536
Parity			
Nulliparous	1		
Primiparous	1.75	[1.15 - 2.68]	0.010
Second pare	2.23	[1.20 - 4.16]	0.011
Multiparous	0.90	[1.40 - 5.85]	0.915
Marital status			
Married	1		
Single	0.62	[0.15 - 2.58]	0.515
Occupation			
Housewife/market gardener	1		
State worker	0.811	[0.54 - 1.23]	0.321
Trader; mandate	1.034	[0.59 - 1.82]	0.907
Learner	0.626	[0.26 - 1.49]	0.289
IVG			
0	1		
1	0.735	[0.47 - 1.16]	0.186
2	1.035	[0.59 - 1.80]	0.905
>3	1.662	[0.81 - 3.42]	0.166
Duration of infertility			
1	1		
2	0.801	[0.48 - 1.34]	0.402
3	1.599	[0.96 - 2.67]	0.072
4 - 5	0.489	[0.28 - 0.86]	0.013
>6	0.276	[0.14 - 0.54]	0.000
Diagnostics			
Without diagnosis	1		
Infection and consequences	0.847	[0.53 - 1.36]	0.491

Continued

Myomatous uterus	1,424	[0.83 - 2.45]	0.202
Ovarian cyst	0.264	[0.29 - 2.43]	0.240
Uterine synechiae	1.616	[0.68 - 3.82]	0.274
Sompk	1		
Early menopause	0.480	[0.88 - 2.63]	0.397
Hyperprolactinemia	1.530	[0.69 - 3.40]	0.296
Conception			
Not having conceived	1		
Having conceived	0.07	[0.03 - 0.18]	0.000

4. Discussion**4.1. General Characteristics of the Patients**

The average age of the patients was 33 ± 5.7 years, with extremes ranging from 20 to 49 years. This observation is close to those of Mboloko *et al.* [8] in the same environment: 33.7 ± 5.2 years and less than 36 years found by Van den Broeck *et al.* [11] in the Netherlands. On the contrary, this average age is higher than that of Ravolamanana *et al.* [12] in 2001 in Madagascar and Moreira *et al.* [13] in 2008: 28 years. Worldwide and in DRC, the age of first motherhood is increasing [14], which can explain why many patients were late in seeking care for infertility. Therefore, they are in a hurry to conceive.

The average duration of infertility was 4.4 ± 3.5 years with a majority (62%) of patients having infertility lasting more than 2 years, comparable to the study by Hermann *et al.* [15] in 2017, in England and Ravalomanana *et al.* [12] in Madagascar, in 2001 who found 4.5 and 4 years respectively. In most pro-natalist countries, the main objective of marriage is to have children. Otherwise, if it takes time, the couple becomes impatient and contacts patients; everybody is supposed to give the solution. That can explain the long itinerary of patients and wandering before seeking specialized care [7]. In addition, the high rate of secondary infertility (69%) and unsafe abortion (56.7%) is consistent with several studies in the sub-Saharan environment. That can be explained by the promiscuous early starting sexuality and the weakness of contraceptive policies in low-income settings like ours that lead to STI and unwanted pregnancies with unsafe abortions, responsible for tubal infertility [16] [17].

4.2. Resilience to Infertility Management

It happened that for all the patients, the median time upon treatment was 6 weeks. However, the nulliparous were more resilient than the primiparous and multiparous ($p = 0.000$) and the patients married more than the singles ($p = 0.001$) [18]. We believe that the lack of children leads to more motivation than those who have already delivered and the pro-natalist environment pushes married to greater motivation [9]. This is corroborated by the risk of dropping out that climbed with the

parity: respectively 1.4, 1.7 and 2.2 times more for primiparous, pauciparous and multiparous. Furthermore, according to Schwartz, 1981 [19], a duration of infertility longer than 4 years is associated with a reduction in the chance to conceive. And that made patients more resilient. It is known that the more the patient ages and the more time to desire motherhood, the less the chance to conceive remains. That is consistent with Bailey *et al.*, 2017 [20], who reported a strong capacity for resilience in patients with a long duration of infertility and treatment.

Patients who got pregnant were the ones who were more resilient. We believe that in the management of infertility out of IVF, time has an important role in getting pregnant. This shows that being resilient ultimately pays in terms of pregnancy.

The limitation of the present study is its retrospective design, which does not make it possible to properly evaluate all the parameters related to resilience; its strength is the fact that it addresses the appreciation of the perseverance of the patient in the treatment in a low-income environment.

5. Conclusion

In conclusion, the majority of the patients were relatively elderly, married, housewives and nulliparous, with a median follow-up time of 6 weeks. Nulliparity, being married and high duration of infertility were the factors determining the resilience to specialized care and conception occurred in more resilient patients.

Conflicts of Interest

The authors declare no conflict of interest regarding this present article.

References

- [1] WHO (2019) International Statistical Classification of Diseases and Related Health Problems 10th Revision. World Health Organization.
- [2] Njagi, P., Groot, W., Arsenijevic, J., Dyer, S., Mburu, G. and Kiarie, J. (2023) Financial Costs of Assisted Reproductive Technology for Patients in Low- and Middle-Income Countries: A Systematic Review. *Human Reproduction Open*, **2023**, hoad007. <https://doi.org/10.1093/hropen/hoad007>
- [3] Cox, C.M., Thoma, M.E., Tchangalova, N., Mburu, G., Bornstein, M.J., Johnson, C.L., *et al.* (2022) Infertility Prevalence and the Methods of Estimation from 1990 to 2021: A Systematic Review and Meta-analysis. *Human Reproduction Open*, **2022**, hoac051. <https://doi.org/10.1093/hropen/hoac051>
- [4] Kadima, M.C., Kabongo, A., Kadima, L.C., Uwonda, A.S., Mbuyamba, N.L. and Mwembo (2023) Factors Associated with Female Infertility Linked to Membership in Mbujimayi (DRC). *Journal of Medicine and Public Health*, **6**, 114-125.
- [5] Gameiro, S., Boivin, J., Peronace, L. and Verhaak, C.M. (2012) Why Do Patients Discontinue Fertility Treatment? A Systematic Review of Reasons and Predictors of Discontinuation in Fertility Treatment. *Human Reproduction Update*, **18**, 652-669. <https://doi.org/10.1093/humupd/dms031>
- [6] Mayenga, J.M. (2013) What Kind of Assistance Medical Reproductive Technic for Africa? *Human Reproduction and Hormones*, **3**, 96-103.

- [7] Touré Ecra, A. (2013) Rationalization of the Management of Infertile Couple. *Human Reproduction and Hormones*, **3**, 19-30.
- [8] Mboloko, E., Nzau, N.E. and Lokengo, L. (2011) Journey of Kinshasa Women Seeking Infertility Care. *Annals of African Medicine*, **4**, 855-863.
- [9] Kreuzer, V., Kimmel, M., Schiffner, J., Czeromin, U., Tandler-Schneider, A. and Krüssel, J. (2018) Possible Reasons for Discontinuation of Therapy: An Analysis of 571 071 Treatment Cycles from the German IVF Registry. *Geburthilfe und Frauenheilkunde*, **78**, 984-990. <https://doi.org/10.1055/a-0715-2654>
- [10] Bedrick, B.S., Anderson, K., Broughton, D.E., Hamilton, B. and Jungheim, E.S. (2019) Factors Associated with Early in Vitro Fertilization Treatment Discontinuation. *Fertility and Sterility*, **112**, 105-111. <https://doi.org/10.1016/j.fertnstert.2019.03.007>
- [11] Van den Broeck, U., Holvoet, L., Enzlin, P., Bakelants, E., Demyttenaere, K. and D'Hooghe, T. (2009) Reasons for Dropout in Infertility Treatment. *Gynecologic and Obstetric Investigation*, **68**, 58-64. <https://doi.org/10.1159/000214839>
- [12] Ravalomanana, R.L., Randaoharison, P.G., Ralaiavy, H.A., Debry, J.M. and Randranjafis-amindrakotroka, N.S. (2001) Etiological Approach to Couple Infertility in Mahajanga. *Archives de l'Institut Pasteur Madagascar*, **67**, 68-73.
- [13] Moreira, P., Fall, C., Dieng, T., Fall, A., Diouf, A. and Moreau, J.C. (2008) Medical Assistance for Pro-Creation: Indication and Perception by Couples with Infertility at the Dakar University Hospital. *Mali Medical*, **23**, 50-56.
- [14] Belaisch-Allart, J., et al. (2009) So-Called Unexplained Infertility: What Results in 2009? National College of French Gynecologists and Obstetricians. *Updates in Medical Gynecology*, 7-19.
- [15] Frank-Herrmann, P., Jacobs, C., Jenetzky, E., Gnoth, C., Pyper, C., Baur, S., et al. (2017) Natural Conception Rates in Subfertile Couples Following Fertility Awareness Training. *Archives of Gynecology and Obstetrics*, **295**, 1015-1024. <https://doi.org/10.1007/s00404-017-4294-z>
- [16] Leke, R.J. (2023) Preventing Infertility: Infectious and Viral Pathologies and Unsafe Abortion. *Human Reproduction et Hormones*, **3-4**, 13-18.
- [17] Aguessy, B. and Aguessy, H. (2013) Local Problems for Infertility Management: Double Care, Traditional Medicine-Pharmacopoeia. *Human Reproduction and Hormones*, **3**, 96-103.
- [18] Domar, A.D., Rooney, K., Hacker, M.R., Sakkas, D. and Dodge, L.E. (2018) Burden of Care Is the Primary Reason Why Insured Women Terminate *in Vitro* Fertilization Treatment. *Fertility and Sterility*, **109**, 1121-1126. <https://doi.org/10.1016/j.fertnstert.2018.02.130>
- [19] Schwartz, D. (1981) Importance of the Duration of Infecundity in Couple Fertility Appreciation. *Population (French Edition)*, **36**, 237-250. <https://doi.org/10.2307/1532547>
- [20] Bailey, A., Ellis-Caird, H. and Croft, C. (2017) Living through Unsuccessful Conception Attempts: A Grounded Theory of Resilience among Women Undergoing Fertility Treatment. *Journal of Reproductive and Infant Psychology*, **35**, 324-333. <https://doi.org/10.1080/02646838.2017.1320366>