

Stress levels and life satisfaction in women undergoing infertility treatment: a preliminary report

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Key words: infertility, stress, life satisfaction, woman.

Abstract

Introduction: The ability to reproduce is an important part of human life, which is why infertility and its treatment, being a source of stress, can cause serious personal and social problems. There are many different definitions of infertility, but the WHO definition is most commonly cited; it defines infertility as a disease of the reproductive system characterized by the failure to achieve a pregnancy after 12 months or more of regular, unprotected sexual intercourse.

Aim of the research: The aim of the study was to determine the level of perceived stress and life satisfaction in a group of women undergoing infertility treatment.

Material and methods: The study was conducted at the 1st Military Clinical Hospital in Lublin. The study involved 110 women treated in the Gynaecology Ward due to infertility. A research tool was prepared for the study, which consisted of three sheets: a self-designed questionnaire, SWLS questionnaire and the PSS-10 questionnaire.

Results and conclusions: The study revealed that women undergoing infertility treatment exhibited average levels of both perceived stress (mean score 21.49) and life satisfaction (mean score 19.52). A significant negative correlation was observed between stress and life satisfaction ($p = 0.010$), indicating that higher stress is associated with lower satisfaction. Significant predictors of higher stress were the patient's age ($p = 0.042$), the duration of treatment ($p = 0.017$), and changes in partner relationships ($p = 0.011$). Conversely, the only factor with a significant positive association with higher life satisfaction was having children ($p = 0.002$).

Introduction

There are many different definitions of infertility, but the WHO definition is most commonly cited; it defines infertility as a disease of the reproductive system characterized by the failure to achieve a pregnancy after 12 months or more of regular, unprotected sexual intercourse [1]. A slightly broader definition is provided by the American College of Obstetricians and Gynecologists (ACOG) and the American Society for Reproductive Medicine (ASRM), according to which infertility is defined as the inability to conceive within 12 months of having regular unprotected sexual intercourse (2–3 times a week) or intrauterine insemination with donor sperm in women under 35 years of age, or within 6 months in women over 35 years of age [2, 3]. In Poland, infertility is estimated to affect up to 1.5 million Polish couples, which constitutes approximately 20% of the population of reproductive age. Of these couples, at least half use primary healthcare services, and an estimated 60% require specialist treatment [4].

The ability to procreate is an important part of human life, which is why infertility and its treatment, be-

ing a source of stress, can cause serious psychological and social damage. The inability to conceive or give birth to children can lead to social exclusion and can also have economic, psychological and health consequences [5]. The negative effects of this situation continue to place a greater social burden on women than on men. Although infertility affects both partners, psychological research often focuses on the female perspective. This concentration stems from the intensity of medical burdens, socio-cultural pressure, and women's emotional expression [6]. Motherhood is an overriding value in most cultures around the world. If motherhood is a desirable and valued social status, infertility can be understood as an obstacle to achieving an important life goal. The diagnostic and treatment processes associated with infertility can contribute to increased psychological stress and reduced life satisfaction in women [7].

Aim of the research

To determine the level of perceived stress and life satisfaction in a group of women undergoing treatment for infertility.

Study design: A cross-sectional descriptive study was carried in the hospital in Lublin. The study was conducted in accordance with the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement [8].

Material and methods

The study was conducted in 2022 at the 1st Military Clinical Hospital with Polyclinic in Lublin. It included 110 women with infertility. Infertility in these patients was confirmed on the basis of an interview in which they reported no pregnancy despite having regular sexual intercourse (at least 4–5 times a week) without using contraception for a period of 12 months. Purposeful sampling was used. The inclusion criteria: age 18 or older and confirmed infertility in the interview. The exclusion criteria: mental illness and other chronic diseases in the medical history. A diagnostic survey method was used to collect the research material. The research tool:

1. A questionnaire developed by the author consisted of information for the respondents, a personal data section and a set of questions about the respondents' behaviour.

2. The Satisfaction with Life Scale (SWLS) by Diener *et al.*, adapted by Juczyński consists of 5 statements. The respondents rate the extent to which each statement has applied to their lives so far: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – neither agree nor disagree, 5 – somewhat agree, 6 – agree, 7 – strongly agree. The respondent can score between 5 and 35 points, with a higher score indicating greater life satisfaction. The results are interpreted using a sten scale, with scores between 1 and 4 considered low, scores between 5 and 6 considered average, and scores between 7 and 10 considered high [9].

3. The Perceived Stress Scale (PSS-10), developed by Cohen *et al.*, adapted by Juczyński and Ogińska-Bulik, is used to assess healthy and sick adults. It consists of 10 questions assessed subjectively by the respondent. The scale is used to assess the intensity of stress related to life situations over the last month. The respondents provide answers by entering the appropriate number, i.e.: 0 – never, 1 – almost never, 2 – sometimes, 3 – quite often, 4 – very often. The overall score on the scale is the sum of all points, i.e. from 0 to 40 points. This indicator is then converted into sten units. A score of 1–4 indicates low stress levels, 5–6 average, and 7–10 high stress levels [10].

The research was originally conducted for a master's thesis and is now being continued in an expanded format.

Statistical analysis

In order to check whether there are statistically significant relationships between the variables, an analysis was performed using Pearson's χ^2 test for qualitative

data. The distribution of quantitative data was examined using the Shapiro-Wilk test. In the statistical analysis, it was assumed that a p -value lower than 0.05 indicates a statistically significant relationship. The analysis was performed using the StatSoft Statistica 13.1 PL.

Results

Characteristics of the study group

The average age in the study group was 31.39 ± 6.21 years. Among the study participants, 10.9% were aged up to 25 years, 20.0% of women were aged 26 to 30, 43.6% of the respondents were aged 31–35, and 25.5% of the respondents were over 35 years old. In terms of education, 81.8% of women in the study group had higher education, 11.8% of respondents had secondary education, and 6.4% of respondents had vocational education. Married women predominated in the sample, accounting for 94.6%, with a significantly lower proportion of women in non-marital relationships (5.4%). In the study group, women living in cities accounted for 71.8% and outnumbered women living in rural areas, who accounted for 28.2% of the total number of respondents. Among the respondents, 13.6% of women confirmed that they had been pregnant before, while 86.4% gave a negative answer.

Life satisfaction in women undergoing infertility treatment

Women with infertility were characterised by average levels of life satisfaction ($M = 19.52$; $SD = 5.88$ points/5–6 sten score).

The relationships between life satisfaction and selected variables are shown in Table 1.

In the study group, a relationship between having children and life satisfaction was observed. The results obtained indicate a statistically significant relationship between these variables ($p = 0.002$).

Stress levels in women undergoing infertility treatment

Women with infertility were characterised by average levels of perceived stress ($M = 21.49$; $SD = 6.07$ points/5–6 sten score).

The relationships between the level of perceived stress and selected variables are shown in Table 2.

Statistical analysis confirmed a significant statistical correlation ($p = 0.042$) between the age of the respondents and their perceived stress levels. Considering the distribution of data, it can be concluded that higher stress levels were more common among women over 30 years of age. There was a statistically significant relationship between the level of perceived stress and the length of time spent trying to conceive ($p = 0.017$). The high levels of stress were more common among women who had been trying to conceive for more than 4 years. A statistically significant relation-

Table 1. Life satisfaction (SWLS) in relation to selected variables

Variable	Life satisfaction (overall)			Total	Significance/ <i>p</i> -value
	High 21 (19.1%)	Average 60 (54.5%)	Low 29 (26.4%)		
Age					
< 25 years	2 (16.6%)	7 (58.4%)	3 (25.0%)	12	$\chi^2 = 0.38$, $p = 0.942$
26–30 years	4 (18.2%)	12 (54.5%)	6 (27.3%)	22	
31–45 years	10 (20.8%)	26 (54.2%)	12 (25.0%)	48	
> 35 years	6 (21.4%)	14 (50.0%)	8 (28.6%)	28	
Time spent trying to conceive					
≤ 2 years	7 (15.2%)	26 (56.5%)	13 (28.3%)	46	$\chi^2 = 2.69$, $p = 0.100$
3–4 years	8 (20.4%)	22 (56.5%)	9 (23.1%)	39	
5–6 years	4 (25.0%)	7 (43.8%)	5 (31.2%)	16	
≥ 7 years	2 (22.2%)	5 (55.6%)	2 (22.2%)	9	
Previous pregnancy					
Yes	3 (20.0%)	8 (53.3%)	4 (26.7%)	15	$\chi^2 = 0.22$, $p = 0.891$
No	18 (17.9%)	52 (55.8%)	25 (26.3%)	95	
Having children					
Yes	3 (42.8%)	3 (42.8%)	1 (14.3%)	7	$\chi^2 = 16.7$, $p = 0.002$
No	18 (17.5%)	57 (55.3%)	28 (27.2%)	103	
Changes in the relationship					
Favourable	3 (23.1%)	7 (58.4%)	3 (23.1%)	13	$\chi^2 = 0.25$, $p = 0.610$
Unfavourable	4 (22.2%)	10 (66.6%)	4 (22.2%)	18	
None	14 (17.7%)	43 (54.5%)	22 (27.8%)	79	
Lack of social acceptance					
Yes	14 (21.5%)	35 (53.9%)	16 (24.6%)	65	$\chi^2 = 0.22$, $p = 0.891$
No	7 (15.5%)	25 (55.6%)	13 (28.9%)	45	
Impact on professional life					
Yes	2 (15.4%)	9 (69.2%)	2 (15.4%)	13	$\chi^2 = 2.50$, $p = 0.642$
No	12 (12.4%)	75 (77.3%)	10 (10.3%)	97	
Psychological help					
Yes	1 (14.3%)	4 (57.1%)	2 (28.6%)	7	$\chi^2 = 2.19$, $p = 0.699$
No, but I intend to	4 (18.2%)	12 (54.5%)	6 (27.3%)	22	
No, and I do not intend to	16 (19.7%)	44 (54.4%)	21 (25.9%)	81	
Satisfaction with sex life					
Yes	16 (18.8%)	46 (54.1%)	23 (27.1%)	85	$\chi^2 = 0.27$, $p = 0.597$
Rather yes	4 (19.0%)	12 (57.2%)	5 (23.8%)	21	
Rather no	1 (25.0%)	2 (50.0%)	1 (25.0%)	4	

Table 2. Level of perceived stress (PSS-10) in relation to selected variables

Variable	Level of perceived stress			Total	Significance/ <i>p</i> -value
	High 7–10 sten 14 (12.7%)	Average 5–6 sten 84 (76.4%)	Low 1–4 sten 12 (10.9%)		
Age					
< 25 years	1 (8.3%)	8 (66.7%)	3 (25.0%)	12	$\chi^2 = 17.4$, $p = 0.042$
26–30 years	2 (9.1%)	16 (72.7%)	4 (18.2%)	22	
31–45 years	9 (18.9%)	34 (70.7%)	5 (10.4%)	48	
> 35 years	2 (7.1%)	26 (92.9%)	0 (0.0%)	28	
Time spent trying to conceive					
≤ 2 years	4 (8.7%)	37 (80.4%)	5 (10.9%)	46	$\chi^2 = 10.1$, $p = 0.017$
3–4 years	4 (10.2%)	31 (79.6%)	4 (10.2%)	39	
5–6 years	4 (25.0%)	10 (62.5%)	2 (12.5%)	16	
≥ 7 years	2 (22.2%)	6 (66.7%)	1 (11.1%)	9	
Previous pregnancy					
Yes	2 (13.3%)	11 (73.4%)	2 (13.3%)	15	$\chi^2 = 0.25$, $p = 0.610$
No	12 (12.6%)	73 (76.9%)	10 (10.5%)	95	
Having children					
Yes	1 (14.3%)	5 (73.4%)	1 (14.3%)	7	$\chi^2 = 0.11$, $p = 0.739$
No	13 (12.6%)	79 (77.1%)	11 (10.3%)	103	
Changes in the relationship					
Favourable	0 (0.0%)	8 (61.5%)	5 (38.5%)	13	$\chi^2 = 12.9$, $p = 0.011$
Unfavourable	10 (66.6%)	4 (22.2%)	4 (22.2%)	18	
None	4 (5.1%)	72 (91.1%)	3 (3.8%)	79	
Lack of social acceptance					
Yes	5 (11.1%)	35 (78.8%)	5 (11.1%)	45	$\chi^2 = 1.64$, $p = 0.440$
No	9 (13.9%)	49 (75.4%)	7 (10.8%)	65	
Impact on professional life					
Yes	2 (15.4%)	9 (69.2%)	2 (15.4%)	13	$\chi^2 = 4.71$, $p = 0.094$
No	12 (12.4%)	75 (77.3%)	10 (10.3%)	97	
Psychological help					
Yes	1 (14.3%)	5 (71.4%)	1 (14.3%)	7	$\chi^2 = 1.27$, $p = 0.529$
No, but I intend to seek	2 (9.1%)	16 (72.7%)	4 (18.2%)	22	
No, and I do not intend to seek	11 (13.6%)	63 (77.7%)	7 (8.7%)	81	
Satisfaction with sex life					
Yes	11 (12.9%)	65 (76.3%)	9 (10.8%)	85	$\chi^2 = 8.41$, $p = 0.077$
Rather yes	2 (9.5%)	16 (76.2%)	3 (14.3%)	21	
Rather no	1 (25.0%)	3 (75.0%)	0 (0.0%)	4	

Table 3. Level of perceived stress and life satisfaction

Life satisfaction	Level of perceived stress						Significance/ <i>p</i> -value
	High <i>N</i> = 14		Average <i>N</i> = 84		Low <i>N</i> = 12		
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	
High <i>N</i> = 21	2	9.5	11	52.4	8	38.1	$\chi^2 = 16.6$, $p = 0.010$
Average <i>N</i> = 60	4	6.7	52	86.6	4	6.7	
Low <i>N</i> = 29	8	27.6	21	72.4	0	0.0	

ship was observed between changes in the relationship with the partner due to difficulties in conceiving and the level of stress experienced by women ($p = 0.011$).

Stress level and life satisfaction in women with infertility

Statistical analysis confirmed a significant impact of stress levels on life satisfaction ($p = 0.010$). Respondents who rated their life satisfaction as low were more likely to experience high levels of stress. In contrast, the vast majority of people with high life satisfaction experienced moderate or low levels of stress. More detailed data are presented in Table 3.

Discussion

Healthcare systems are increasing their focus not only on morbidity and mortality, but also on people's subjective well-being and quality of life. Subjective well-being comprises two main elements: affective (positive and negative emotions) and cognitive, which refers to life satisfaction. Life satisfaction is an assessment of feelings and attitudes towards one's own life at a given time, which varies between positive and negative. In a way, it is a reflection of the assessment of one's own existence in the context of cultural and axiological patterns known to the individual. In other words, it can be said that the definition of life satisfaction is simply a measure of how much someone likes the life they lead [10, 11].

A study evaluating life satisfaction in women undergoing infertility treatment found they had an average level of life satisfaction and moderate perceived stress. Statistical analysis confirmed a significant link between these variables ($p = 0.010$), indicating that lower life satisfaction is associated with higher stress. This suggests that stress from infertility treatment fundamentally impacts the psychophysical well-being of the women studied.

The average SWLS score for the entire study group was 19.52 points. This indicates average life satisfaction, although close to the lower limit of this category.

Slightly higher results were reported by Nagórska *et al.*; average life satisfaction measured using the same scale was 23.80 points [12]. In other studies [13], the overall life satisfaction score among women with infertility was even higher – 25.51 points. Many studies point to cultural differences in the retrospective assessment of one's quality of life. People from Western countries attach greater importance to positive emotions than people from Eastern countries [14]. However, the average SWLS score among Japanese women was comparable to that of the present study and amounted to 21.2 points [15]. In contrast, in a study conducted in Iran, the average SWLS score among women diagnosed with infertility was 23.65 points, which, according to local validation of the test, corresponds to average life satisfaction [11]. Statistical analysis in our own research showed a significant correlation between having children and the level of life satisfaction ($p = 0.002$). Among women who had children, the largest group (42.8%) reported high satisfaction. This is consistent with the findings of other authors who indicate that a prior live birth is a positive factor influencing life satisfaction [15–17]. Our study also showed that neither the age of the women ($p = 0.942$), the duration of attempts to conceive ($p = 0.100$), nor a previous pregnancy ($p = 0.891$) had a significant impact on life satisfaction. Similar findings were reported in a study by Maroufizadeh *et al.* [11].

When examining overall life satisfaction, the question arises as to whether relationships change in the course of experiencing infertility and the difficulties associated with its treatment. In our own study, 71.8% of women stated that nothing had changed in their relationship with their partner after the diagnosis of infertility, and 11.8% of women stated that these relationships had actually improved. This is quite interesting, as other studies confirm that the process of infertility treatment has a negative impact on relationships between partners [18]. However, it should be emphasised that in this study, we have no knowledge of the infertility type, cause or treatment. It appears that there are certain dif-

ferences in life satisfaction among couples, depending on the cause of infertility and the method of treatment, and this may affect the relationship between partners [19]. There are also studies showing that infertility does not impair relationships; on the contrary, it can have a positive effect by increasing the sense of closeness between partners [20].

In many cases, infertility destroys the voluntary and pleasurable aspects of sexual function by reducing it solely to the pursuit of pregnancy [21]. In the case of infertility, the need to engage in sexual intercourse during the fertile days of the cycle leads to a loss of spontaneity and naturalness in favour of perceiving sex as a duty [22, 23]. Some studies have shown that couples undergoing infertility treatment experience numerous sexual problems, such as erectile dysfunction and premature ejaculation in men and decreased libido in women [24]. Among the women surveyed, 77.3% were satisfied with their sex lives. Furthermore, there was no significant correlation between the respondents' overall life satisfaction and satisfaction with their sex lives.

Infertility in couples is associated with feelings of shame and social stigmatisation, which refers to a situation in which women struggling with infertility face discrimination from others [25]. In our own study, 31.9% of respondents confirmed that they experienced a lack of social acceptance due to infertility. This is a fairly high percentage considering that social support is a protective factor for the mental health of people struggling with infertility. There are also studies indicating that this support can have a negative impact on a woman's well-being. This is because family intervention can also be perceived as additional pressure [26].

The relationship between stress and infertility has been the subject of scientific debate for many years. This is because infertility is considered one of the most stressful life events. Infertility can generate personal stress, but also stress within the family, causing disturbances in its normal functioning [27]. In addition, there is evidence suggesting that stress caused by a diagnosis of infertility may reduce the chances of successful treatment [28]. Our own research has shown that in a group of women undergoing infertility treatment, the level of perceived stress was average (21.49 points). For comparison, in a study by Nagórska *et al.* [29], the average score for perceived stress among women with infertility was 20.87 points, which corresponds to an average level of this phenomenon. A significantly higher stress level among women undergoing infertility treatment was observed in another study, where the average PSS-10 score was 27 points, indicating a high level of perceived stress. However, it should be emphasised that psychological stress observed in this study may be due to the fact that it was conducted during a pandemic. Isolation and social distancing undoubtedly affected the daily mental functioning of the respondents [30].

The study confirmed a significant impact of stress levels on life satisfaction. Respondents who rated their life satisfaction as low were more likely to experience high levels of stress. In contrast, the vast majority of people with high life satisfaction experienced moderate or low levels of stress. In our own research on infertility, only 6.4% of women had previously sought psychological help. Similarly, in the study by Nagórska *et al.* [29], most respondents did not consult a psychologist, and only a small percentage declared that they would like to seek such help in the future. It can be assumed that this lack of perceived need for psychological support in both groups is related to the fact that the duration of infertility treatment for most respondents did not exceed 4 years.

The research results presented encourage further scientific inquiry. This is because the study had certain limitations. Firstly, it involved a relatively small sample size. Despite a small sample size ($n = 110$), the calculated margin of error (1.45 for PSS-10 and 1.10 for SWLS) suggests the mean test results are reliable within the given score ranges. Secondly, the study was conducted only among women diagnosed with infertility, which limits the possibility of comparison with fertile women. Thirdly, the study group represented only the eastern part of Poland (a gynaecological ward in Lublin) and therefore cannot be representative of the entire population of women who have problems conceiving a child in Poland. Another limitation of the study may be due to the convenient group selection method of selecting participants for their convenient accessibility and proximity. This does not allow us to generalise the results of the study. Fourthly, some information on the type, cause and treatment of infertility is unknown, which could affect the implementation of a more detailed analysis.

Conclusions

The study found that women undergoing infertility treatment have average levels of perceived stress and life satisfaction. A significant negative correlation was observed, indicating that an increase in stress is associated with a decrease in life satisfaction ($p = 0.010$). Significant predictors of higher stress were the patient's age ($p = 0.042$), duration of treatment ($p = 0.017$), and changes in partner relationships ($p = 0.011$). In contrast, having children was the only factor with a significant statistical relationship to higher life satisfaction ($p = 0.002$), suggesting it is a protective factor for psychological well-being in this group.

Attention should be paid to assessing the mental health of women undergoing infertility treatment and to improving the knowledge of medical staff, particularly midwives and gynaecologists, about the psychosocial consequences of reproductive difficulties and the possibilities for psychological intervention.

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Ethical approval

The study was conducted in accordance with the principles of the Declaration of Helsinki and with the consent of the Bioethics Committee of the Medical University of Lublin (KE – 0254/193/10/2022).

Conflict of interest

The authors declare no conflict of interest.

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