

▪ **Basic Research**

**The Mediation of Self-Esteem in The Relationship Between Infertility Stigma and Sexual Satisfaction Among Infertile Women: A Nursing Perspective Study**

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**Abstract**

**Background:** Those who are infertile frequently exhibit low levels of self-worth and may experience difficulties with their sexual ability. **Goal:** Investigate how self-esteem affects the relationship between infertility stigma and infertile women's degree of sexual pleasure. **Methodology:** A STROBE-compliant descriptive correlational analysis was performed. Conveniently, a sample of 200 infertile women was chosen throughout three months, from July to September 2023. **Instruments:** The Sexual Satisfaction Scale, the Rosenberg Self-Esteem Scale, and the Infertility Stigma Scale were used in the study. **Findings:** The research revealed a significant adverse relationship between infertility stigma and sexual satisfaction. Additionally, a negative association was observed between infertility stigma and self-esteem. Conversely, a positive correlation was identified between self-esteem and sexual satisfaction. High levels of self-esteem were predictive of increased sexual satisfaction, while low self-esteem was predictive of infertility stigma. Furthermore, self-esteem was identified as a partial mediator in the link between infertility stigma and sexual satisfaction. **Conclusion:** Infertility stigma is linked to diminish sexual satisfaction and reduced self-esteem. Self-esteem was found to play a partial mediating role in the association between infertility stigma and sexual satisfaction. **Nursing implications:** Nurses are pivotal in providing support to individuals grappling with infertility through interventions aimed at enhancing self-esteem, thereby enhancing their overall well-being and sexual satisfaction.

**Keywords**

Infertility stigma, Self-esteem, Sexual satisfaction, infertile women, Mediation analysis.

## Introduction

Being a mother is a beautiful gift from God. It can be emotionally upsetting when attempts to conceive a child fail (Ulrich, 2000), especially in Eastern culture, which places a lot of emphasis on developmental milestones for women, pregnancy, and parenthood. Previous research suggested many factors would cause the prevalence of infertility rate to rise, including the typical reproductive population's aging, lifestyle changes, environmental pollution, life pressure, and food safety (Katole & Saoji, 2019). In Egypt, the Central Agency for Public Mobilization and Statistics (CAPMAS) reported that the fertility rate per woman decreased in 2021 to 2.8, marking a 20% decrease from the 3.5 births per woman recorded in the previous survey conducted in 2019. This decline in fertility rates can result in significant psychological stress for individuals dealing with infertility and undergoing related treatment processes, affecting both the patients and their families (Foti, 2023).

In a pronatalist society, having children defines a woman as a person. The "social disorder" of infertility would endanger a woman's gender identity and her ambitions of starting a family (Wilson, Kristin, 2009). Studies have shown that women facing infertility tend to experience more mental health issues caused by stress related to the condition when compared to men (Schmidt, 2009; Schaller et al., 2016). Being diagnosed with infertility can trigger a range of negative emotions in women, such as anxiety, depression, guilt, feelings of stigma, reduced self-esteem, loneliness, social isolation, and increased psychological stress. These emotions are often the result of societal pressure to have children and the desire for parenthood that persists throughout their lives (Sahraian et al., 2015).

Stigma, which is a negative psychological attitude, has been associated with various adverse outcomes. According to its definition, stigma creates a negative sense of social difference that leads to individuals feeling isolated, having poor self-perception, and experiencing self-blame and self-denigration. Infertility stigma is a prevalent issue that affects two significant aspects of life, namely self and social stigma (Corrigan & Rao, 2013). A person's life may be drastically altered by infertility, which is often seen as a failure to live up to society's expectations of what it means to be a woman (McQuillan et al., 2021). In underdeveloped nations, where women are frequently blamed for their partner's infertility, this stigma is more pervasive and can cause psychological pain as well as social rejection. Therefore, it is possible that infertile women would encounter more unfavorable reactions from other people (Fu et al., 2015).

Moreover, it is detrimental to internalize family or public stigma and transform it into one's own stigma (Taebi et al., 2021). Unfortunately, it is easy for someone to internalize social stigma, resulting in feelings of inferiority, loneliness, self-blame, and self-derogation in social situations (Zhao et al., 2022). Infertile patients frequently adopt a self-closing and marginalization strategy to avoid social interactions. Additionally, the stigma surrounding infertility can cause stress in one's marital, sexual, and social relationships (Corrigan & Rao, 2013).

One of the most essential human needs is sexuality. Infertility can harm a couple's sexual life (Brown et al., 2022). In reality, there is a bidirectional relationship between sexual satisfaction and infertility; among the elements that had the most significant impact on infertile women's sexual satisfaction were lack of pleasure during intercourse, which could result from the pressure of having scheduled intercourse, and low sexual self-esteem (Czyżkowska et al., 2016). Furthermore, the fear of facing another disappointment intensifies their stress because couples dealing with infertility often worry about the possibility of not achieving a pregnancy during their attempts at sexual activity (Berg et al., 1991). Conversely, dissatisfaction with their sexual experiences can contribute to the couple's inability to

conceive and create a detrimental cycle (Kamel, 2010). In some cases, infertile women may even lose their interest in engaging in sexual activity (Shahraki et al., 2019; Sahebalzamani et al., 2018). A recent study conducted by Masoumi et al. (2017) revealed that 50-60% of couples reported significantly lower levels of sexual satisfaction during infertility treatment. Various studies have indicated that individuals in more advanced stages of infertility, as measured by the duration of infertility, tend to have lower levels of sexual satisfaction compared to those in early or intermediate stages (Berg et al., 1991).

To be a sexually satisfied person, one should have good self-esteem. Self-esteem is one of the main determinants of personality and a factor in the development of human behavior. People exhibit several attitudes and convictions that make up their sense of self-worth when interacting with others. Self-esteem estimates how much a person believes they are valued, competent, and relevant (Schmidt, 2009). According to the socio-meter theory, a person's self-esteem is a barometer for the value of their current social connections. A person's self-esteem will increase if they can live up to the expectations of their partner in a romantic relationship (for example, through sexual behavior), and the opposite is also true (Leary, 1999). Infertility has a negative impact on most married lives, especially on the wife's self-esteem, their concept of her body image, and their self-evaluation that she is inadequate or flawed, as well as unattractive and undeserving of regard by others (Zayed, El-Hadidy, 2020).

Research suggests that enhancing self-esteem can improve sexual satisfaction in intimate relationships (Shahraki et al., 2018). In addition, studies have found that self-esteem can mitigate the negative effects of infertility, such as stress, depression, and anxiety (Cui et al., 2021). Moreover, young adults who have high levels of self-esteem are less likely to be negatively affected by body-related shame and guilt, according to further research (Wang et al., 2022).

Positive psychology has become increasingly popular as a means of identifying and treating mental health problems. Therefore, exploring how self-esteem can mediate the relationships between infertility stigma and sexual satisfaction in infertile women may offer a unique approach to psychological care for infertile patients by enhancing their self-esteem. This study aimed to investigate the potential mediating role of self-esteem.

### **Research hypothesis**

- Infertile women would suffer from high level of infertility stigma, had low self-esteem, and low prevalence of sexual satisfaction.
- Self-esteem could mediate the relationship between infertility stigma and sexual satisfaction among infertile women.

### **Research design**

The study was conducted over three months using a descriptive correlational analytical research strategy. It commenced in July and concluded in October 2023.

### **Setting**

The data was collected from the infertility clinic of EL-Shatby Maternity University Hospital in Alexandria governorate. This hospital was selected because it represents Alexandrian central maternity health agency and has a high turnover of women seeking obstetric and gynecological health care services.

### **Participants**

This study sought to determine the ideal sample size for its analysis using the G\*Power software 3.1.9.7. The aim was to achieve an effect size of 0.5, a significance threshold of 0.05, and a statistical power of 0.90. The software determined that a minimum of 196 infertile

women participants were required to meet these conditions. Then, a group of 200 infertile women who were present at the designated sites were picked according to certain inclusion criteria, such as being between the ages of 20 and 40, not having any health or psychiatric problems, and being eager to participate.

### **Tools**

Four tools were utilized in total to collect the necessary data. The following was how these instruments were used:

#### **Tool I: Socio-demographic, health-related and infertility data questionnaire**

The researcher created and employed these tools. It will comprise the following components: Part 1: The socio-demographic attributes of women (age, education level, employment, monthly income, place of residence, and family structure).

Part 2: Information on women's health and infertility, including the length of marriage, the kind, the duration, and the primary reason for infertility.

#### **Tool II: The Infertility Stigma Scale (ISS)**

Developed by Fu et al. in 2015, the Infertility Stigma Scale (ISS) is an instrument designed to measure women's internal perceptions of infertility. This measure assesses individual perspectives on stigma and their emotions related to guilt, shame, and self-worth. It has 27 items total, divided into 4 subsets: social disengagement (5 items), public stigma (9 items), familial stigma (6 items), and self-devaluation (7 items). Using a 5-point Likert scale, which goes from "strongly disagree" (1 point) to "strongly agree" (5 points), respondents rate each item. The scale's total score can range from 27 to 135. The Cronbach's alpha values for each subset were 0.86 for self-devaluation, 0.77 for social withdrawal, 0.92 for public stigma, and 0.84 for family stigma. Within the current investigation, the Cronbach's alpha coefficients for these subsets were 0.81, 0.82, 0.75, and 0.82, respectively.

#### **Tool III: Rosenberg self-esteem scale, structured interview schedule**

Originally introduced by Rosenberg in 1965, this tool will be utilized by the researcher to evaluate a single core factor that reflects overall self-esteem. Comprising 10 items, participants express their sentiments using a four-point Likert scale, ranging from "strongly disagree" (0) to "strongly agree" (3). The potential total score ranges from 0 to 30. Scores falling between 15 and 25 are considered typical, scores below 15 indicate low self-esteem, and scores above 25 signify high self-esteem. Noteworthy is that for items 3, 5, 8, 9, and 10 (which are phrased in a reverse manner), the scores on the Rosenberg self-esteem scale demonstrated acceptable reliability ( $\alpha = 0.778$ ). In the present exploration, the Cronbach's alpha coefficient for this scale was 0.88.

#### **Tool IV: Sexual Satisfaction Scale for Women (SSS-W)**

The SSS-W scale is a brief instrument that Meston & Trapnell (2005) created to assess sexual pleasure and distress. It has 30 items. Five components comprise this scale's construction: personal concern, relationship concern, communication, compatibility, and contentment. A 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), is used to evaluate each item on the scale. Higher subscale scores are associated with greater sexual pleasure and lower levels of sexual distress. The subscale scores are calculated using the scoring rules for the SSS-W provided by Meston and Trapnell (2005). Sound psychometric qualities of the scale are demonstrated, such as concept validity and internal consistency ( $\alpha = 0.904$ ). The Cronbach's alpha coefficient for the current study was 0.890.

### **Methods**

#### **Validity**

Five psychology and psychiatric nursing experts assessed the face validity of the Arabic versions of the Sexual Satisfaction Scale for Women, the Rosenberg Self-Esteem Scale, and

the Infertility Stigma Scale. The material in these tools was verified to be legitimate, with a Lawshe material Validity Ratio over 0.99.

### **Pilot study**

The instruments were thoroughly reviewed to ensure their accuracy, clarity, relevance, and suitability. A pilot study involving 20 infertile women was conducted to assess the feasibility and clarity of the research measures. The results of the pilot study indicated that no modifications were required, confirming the instruments' appropriateness.

### **Data collection**

The research was conducted over a three-month period, specifically from July to September 2023. After obtaining the necessary official permissions, the research team met with the women experiencing infertility to thoroughly explain the goals and intentions of the study. The data was gathered during the working hours of the hospital, in accordance with the women's schedules, over five days a week. Each day, the team spent between 10 to 20 minutes interviewing each woman.

### **Data analysis**

The study data was analyzed using IBM SPSS software package version 23 (AMOS 23.0). The Pearson coefficient was used to correlate customarily distributed quantitative variables. Regression was used to predict the effect of self-esteem on infertility stigma and sexual satisfaction. Path analysis was conducted using AMOS 23.0 software to identify infertility stigma's direct and indirect impact on sexual satisfaction mediated by self-esteem. The statistical significance of the findings was evaluated at the 5% level.

### **Ethical considerations**

The Research Ethics Committee of the Faculty of nursing at Alexandria University granted ethical approval for the study in Egypt. Official approval to conduct the study was obtained by submitting an official letter from the Dean of the Faculty of nursing at Alexandria University to the responsible authorities of El-Shatby Maternity University Hospital. The title and purpose of the study were illustrated, as were the primary data items to be covered. Before data collection, women were sought for their approval, and the study's objectives were elucidated. Participants and the legal guardians of uneducated women were then asked to provide informed written consent. It was made clear to the women participating in the study that they had the right to withdraw without needing to provide a reason and would not face any negative consequences.

### **Results**

Table 1 illustrates data about the demographic characteristics of the study participants. It shows that 41% of the participants were between 20 and 30, while 59% were between 30 and 40. The mean age was 30.55 years, with a standard deviation of 3.676. Regarding education, 44.5% had a university degree, and 46.5% had a secondary education. Most participants (66.5%) were employed, and 52.5% lived in rural areas. More than half of the studied participants lived in extended families (53%) and had just enough income (54%). Also, approximately two-thirds of the infertile women in the study did not have a medical history (64%).

Table 2 presents data on infertility-related factors among the study participants. 65.5% of participants got married between the ages of 21 and 26. The mean age of marriage was 21.95 years, with a standard deviation of 2.37. Regarding the duration of marriage, more than half

of the women were married for less than 10 years (57%), and from 5 to 10 years, there was duration of infertility (52.5%). Most participants (54.5%) had primary infertility, and the most common cause was female-related (38.0%).

Table 3 provides the study variables' mean, standard deviation, and levels. The table shows that public stigma was considered the highest perceived stigma experienced by infertile women (28.33), followed by self-devaluation 24.87. 65.5% of participants also had a high level of infertility stigma, while 34.5% had a low level. Infertile women reported high sexual satisfaction in relational concern with a mean score of  $24.39 \pm 9.62$ , followed by communication ( $19.79 \pm 4.14$ ). Also, more than half of the infertile women had high levels of sexual satisfaction (56%). The infertile women reported low self-esteem with a mean score of  $22.85 \pm 3.45$ ; more than half of women suffer from low self-esteem (51.5%).

The fourth table in this study illustrates the utilization of the Pearson correlation coefficient ( $r$ ) to examine the connections between infertility stigma, sexual satisfaction, and self-esteem. The findings reveal a negative correlation of  $-0.471$  between infertility stigma and sexual satisfaction, indicating that heightened levels of infertility stigma are linked to reduced levels of sexual satisfaction, with statistical significance at  $p \leq 0.001$ . Moreover, a negative correlation of  $-0.582$  is observed between infertility stigma and self-esteem, suggesting that increased levels of infertility stigma correspond to lower levels of self-esteem, also statistically significant at  $p \leq 0.001$ . Conversely, a positive correlation of  $0.436$  is identified between sexual satisfaction and self-esteem, implying that heightened levels of sexual satisfaction are associated with increased levels of self-esteem, with statistical significance at  $p \leq 0.001$ .

Furthermore, table 5 presents outcomes from the linear regression analysis, indicating significant relationships between self-esteem and infertility stigma. The analysis indicates that self-esteem negatively predicts infertility stigma ( $B = -0.804$ ,  $Beta = -0.582$ ,  $p < 0.001$ ), indicating that enhanced self-esteem is connected to reduced levels of infertility stigma. The model accounts for 33.8% of the variance in infertility stigma ( $R^2 = 0.338$ ), with the overall model being highly significant ( $F = 101.306$ ,  $p < 0.001$ ). Additionally, there is a positive prediction of self-esteem on sexual satisfaction ( $B = 0.575$ ,  $Beta = 0.437$ ,  $p < 0.001$ ), meaning that elevated levels of self-esteem are linked to higher levels of sexual satisfaction. The model explains 19.1% of the variance in sexual satisfaction ( $R^2 = 0.191$ ), with the overall model being statistically significant ( $F = 46.716$ ,  $p < 0.001$ ). These results suggest that self-esteem plays a significant role in influencing infertility stigma and sexual satisfaction. Individuals with higher self-esteem levels tend to experience lower levels of infertility-related stigma and report increased sexual satisfaction. These findings emphasize the importance of addressing self-esteem in interventions aimed at reducing infertility stigma and enhancing sexual well-being among individuals facing infertility challenges.

Additionally, the table 6 and Figure 1 in the paper display the direct and indirect impacts of infertility stigma, self-esteem, and sexual satisfaction. The data demonstrates a direct effect of infertility stigma on sexual satisfaction ( $-0.311$ ), indicating that heightened levels of infertility stigma are associated with reduced sexual satisfaction levels ( $p < 0.001$ ). Similarly, there is a direct effect between infertility stigma and self-esteem ( $-0.41$ , statistically significant at  $p < 0.001$ ). Furthermore, the direct effect between self-esteem and sexual satisfaction is  $0.325$ , statistically significant at  $p = 0.001$ . The mediation analysis indicates that self-esteem partially mediates the relationship between infertility stigma and sexual satisfaction (indirect effect =  $-0.137$ ,  $p < 0.001$ ). The model fit parameters, including the

Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), were also provided to assess the overall fit of the model to the data. The results suggest that the model fits well in this case, as indicated by an RMSEA of 0.061.

**Table (1): Distribution of the studied sample according to their demographic data (n= 200).**

Demographic data	No	%
<b>Age</b>		
20-<30	82	41.0
30-40	118	59.0
<b>Mean± SD</b>	<b>30.55±3.676</b>	
<b>Education</b>		
Illiterate /read and write	1	.5
Primary/ preparatory	11	5.5
Secondary	93	46.5
University	89	44.5
Postgraduate	6	3.0
<b>Occupation</b>		
Housewife	67	33.5
Work	133	66.5
<b>Type of work</b>		
Professional	41	20.5
Employee	65	32.5
Worker	6	3.0
Free work	20	10.0
Farmer	1	.5
<b>Place of residence</b>		
Rural	105	52.5
Urban	95	47.5
<b>Family type</b>		
Nuclear	94	47.0
Extended	106	53.0
<b>Income</b>		
Enough and saving	57	28.5
Just enough	108	54.0
No enough	35	17.5
<b>Health history</b>		
Yes	72	36.0
No	128	64.0
<b>Disease history</b>		
No	128	64.0
HTN	16	8.0
DM	26	13.0
Cardiac diseases	9	4.5
Pulmonary diseases	11	5.5
Thyroid dysfunction	10	5.0

**Table (2): Distribution of the studied sample according to their infertility data (n= 200).**

Demographic data	No	%
<b>Age of marriage</b>		
16-<21	65	32.5
21-<26	131	65.5
26-<30	4	2.0
<b>Mean± SD</b>	<b>21.95±2.37</b>	
<b>Duration of marriage</b>		
<10	114	57.0
10-<20	84	42.0
20-<30	2	1.0
<b>Mean± SD</b>	<b>8.61±3.74</b>	
<b>Duration of infertility</b>		
<5	37	18.5
5-<10	105	52.5
10-<15	53	26.5
15-<20	5	2.5
<b>Mean± SD</b>	<b>7.81±3.31</b>	
<b>Type of infertility</b>		
1ry	109	54.5
2ry	91	45.5
<b>Causes of infertility</b>		
Male	23	11.5
Female	76	38.0
Both male and female	48	24.0
Unknown	53	26.5

**Table (3): Mean, standard deviation, and levels of Infertility Stigma Scale, sexual satisfaction and self-esteem (n= 200).**

Study variables	Mean	SD	Low (< mean)		High (≥ mean)	
			No	%	No	%
<b>Infertility Stigma Scale</b>	89.99	12.81	69	34.5	131	65.5
Self-devaluation	24.87	4.83	95	47.5	105	52.5
Social withdrawal	17.88	3.04	103	51.5	97	48.5
Public stigma	28.33	4.64	74	37.0	126	63.0
Family stigma	19.80	2.91	81	40.5	119	59.5
<b>Sexual satisfaction</b>	76.58	13.98	88	44.0	112	56.0
Contentment	17.62	2.61	67	33.5	133	66.5
Communication	19.79	4.14	142	71.0	58	29.0
Compatibility	14.11	4.79	95	47.5	105	52.5
Relational Concern	24.39	9.62	107	53.5	93	46.5
Personal Concern	17.62	2.61	103	51.5	97	48.5
<b>Self esteem</b>	22.85	3.45	69	34.5	131	65.5

The more mean score; the more feeling of infertility stigma, greater satisfaction, and higher self-esteem.



**Table (4): Correlation matrix between Infertility Stigma, Sexual satisfaction, and Self-esteem (n = 200)**

		Infertility Stigma	Sexual satisfaction
Infertility Stigma	r		
	p		
Sexual satisfaction	r	-0.471*	
	p	<0.001*	
Self esteem	r	-0.582*	0.436*
	p	<0.001*	<0.001*

r: Pearson coefficient

\*Statistically significant at  $p \leq 0.05$ **Table (5): Linear Regression Analysis for Self-esteem predicting infertility stigma and sexual satisfaction (n = 200)**

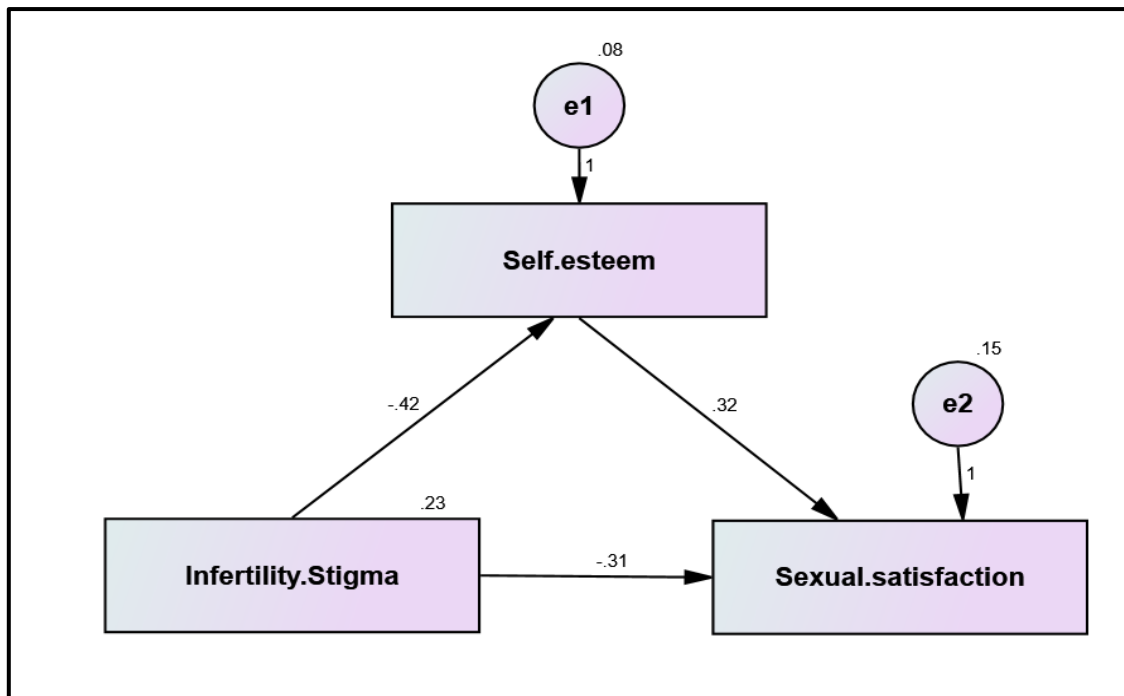
	B	Beta	t	p	95% CI	
					LL	UL
Self-esteem predicting infertility stigma	-0.804	-0.582	10.065*	<0.001*	-0.961	-0.646
<b><math>R^2 = 0.338</math>, <math>F = 101.306</math>, <math>p &lt; 0.001</math>*</b>						
Self-esteem predicting and sexual satisfaction	0.575	0.437	6.835*	<0.001*	0.409	0.741
<b><math>R^2 = 0.191</math>, <math>F = 46.716</math>, <math>p &lt; 0.001</math>*</b>						

F, p: f and p values for the model.  $R^2$ : Coefficient of determination. B: Unstandardized Coefficients  
 Beta: Standardized Coefficients. t: t-test of significance. LL: Lower limit. UL: Upper Limit.

\*: Statistically significant at  $p \leq 0.05$ **Table (6): Direct and Indirect Effect between Infertility, Self-esteem, and sexual satisfaction (n = 200)**

Variable 1		Variable 2	Direct effect	Indirect effect	S.E	C.R	p-value
Self esteem	←	Infertility Stigma	-0.421	0.0	0.042	-10.091*	<0.001*
Sexual satisfaction	←	Infertility Stigma	-0.311	-0.137	0.071	-4.363*	<0001*
Sexual satisfaction	←	Self esteem	0.325	0.0	0.099	3.295*	<0.001*

Model fit parameters (comparative fit index = 1.000; incremental fit index = 1.000; Tucker Lewis Index = 1.000; root mean square error of approximation = 0.061, Model  $\chi^2$ ; significance 47.521\* (<0.001\*))



**Figure (1) Path analysis of direct and Indirect Effect between Infertility, Self-esteem, and sexual satisfaction (n = 200)**

### Discussion

Prior research emphasizes the significance of addressing the psychological components of infertility. This study analyzes the impact on women who struggle with inferiority feelings. The study's findings showed that the infertility stigma levels were high among participants. This indicates that infertility is a highly stigmatizing issue. According to a previous study, (ineffective) infertility therapy raises the likelihood of negative emotions, including feelings of stigma and guilt (Keskin and Babacan Güm, 2014). This could be applied in this study as more than half of the women had from 5 to 10 years of infertility. Also, they were between the ages of 30 and 40 years. Moreover, most participants had primary infertility, aggravating negative evaluation and feelings.

More precisely, the results of this study showed that women who were infertile experienced severe societal shame. This might be explained by the fact that the study was carried out in a traditional setting where it is expected of women to have children and that infertility can lead to shame and feelings of inadequacy. Furthermore, more than half of the sample lived in rural areas with big extended families. Mental health may suffer if this stigma is internalized as self-stigma. Public stigma was shown to be highly prevalent in our study, followed by self-devaluation. According to Corrigan & Rao (2013), infertile people only have negative impacts on their mental health when they associate with others who reinforce stigma and internalize it as a kind of self-stigma.

According to the research, almost half of women who are unable to conceive suffer from lower levels of sexual satisfaction. The reason behind this could be the belief among many women in Arabic and Egyptian countries that sexual activity is insignificant if they cannot get pregnant, which leads to a decrease in their interest in sex and overall satisfaction. This finding is consistent with a recent study conducted by Wischmann et al. (2014), which highlighted that infertile women tend to experience a loss of spontaneous sexuality and a decline in their sexual self-esteem. It has also been suggested that stress-related changes in

the hypothalamic-pituitary-gonadal axis can affect sexual behavior and gonadotrophin levels, which may explain the link between infertility and sexuality.

According to recent studies, more than half of infertile women also have poor self-esteem. This could be the result of the inferiority and incompleteness complex that many women go through when they are unable to conceive. The study also discovered that women who had infertility that was not explained or that was due to variables associated with women encountered additional difficulties. For example, a loving spouse of an infertile wife could still need to marry someone else to become a parent. For women, all these infertility-related issues can be extremely stressful and lower their self-esteem. This result aligns with earlier research that produced comparable findings (Behboodi-Moghadam et al., 2013).

Contrary to the study's expected low self-esteem among women with infertility, the average score for self-esteem based on RSES may be because over half of the subjects had a university degree, followed by a secondary education. Instead of limiting themselves to parenthood and concentrating on this life goal, women with higher levels of education may seek other social or professional options or alternate life roles. This is consistent with earlier research, which showed a favorable relationship between educational attainment and self-esteem (Mishra & Dubey, 2014).

Sexual satisfaction and the shame associated with infertility are negatively correlated. This outcome is predicted since, for women of reproductive age, being diagnosed with infertility is a stressful life experience that can result in stigma and lingering unpleasant emotions, including social isolation, sadness, and worry. Then, to varied degrees of intensity and frequency, these negative feelings have an adverse effect on partner interactions, leading to a rise in marital disputes and a drop in sexual pleasure.

The study showed a negative relationship between infertility stigma and self-esteem, which may be related to our culture's emphasis on parental responsibilities like having children above personal interests, and remarks about their infertility could exacerbate feelings of inferiority. This is consistent with earlier research indicating that women may define themselves adversely after learning they are infertile, feel inferior, useless, imperfect, self-blame, and ashamed for not living up to cultural and familial standards (Ergin et al., 2018).

According to the study, there is a link between sexual satisfaction and self-esteem, suggesting that poor self-esteem might result in unpleasant emotional experiences that have an adverse effect on sexual satisfaction. The idea is that a person's interpersonal relationships are reflected in their self-esteem, linked to greater acceptability and likeability by others. On the other hand, interpersonal connection problems can cause a decline in self-esteem, which can cause unfavorable emotional reactions and a decline in the quality of relationships. This result agrees with Türkben et al. (2021), who found a link between sexual quality of life and self-esteem.

The outcomes of the linear regression analysis concerning the prediction of infertility stigma indicated a negative relationship between self-esteem and infertility stigma. The model accounted for 33.8% of the variability in infertility stigma, and the overall model demonstrated high significance. This implies more of a causal relationship than just an association. Strong negative feelings may be experienced by persons who are stigmatized for their infertility, but those who have high levels of optimism, self-efficacy, and self-esteem can use their problem-solving abilities to combat stigma. Conversely, those with a high sense of their own worth are immune to emotional suffering (Fang et al., 2021).

Also, regression analysis showed that self-esteem positively predicted sexual satisfaction. Self-esteem was independently associated with sexual satisfaction, indicating a causal link. Reasonably, infertile people who had strong self-esteem also reported having high levels of sexual pleasure because they were able to bounce back fast from hardships in both daily life and medical problems. This aligns with a recent Sakaluk et al. (2020) study, which reported that sex and self-esteem were significantly related.

According to the study's hypothesis, women who deal with infertility and report feeling more stigmatized by it are also more likely to be low on the self-esteem scale. Therefore, a drop in sexual pleasure was predicted to result from this reduced self-esteem. According to the study's findings, there is a strong indirect link between sexual pleasure and the stigma associated with infertility. Further investigation showed that the relationship between sexual pleasure and the stigma associated with infertility was largely mediated by self-esteem. Our results are in line with a study conducted by Wang et al. (2022), which highlighted the significance of resilience and perceived stress in determining the quality of life for those who are facing infertility.

Therefore, the study suggests that having high self-esteem among infertile women is linked to lower levels of infertility stigma and greater sexual satisfaction, even in the presence of substantial infertility-related stigma. This highlights the importance of improving patients' self-esteem as a positive and strategic approach to treatment, leading to improved long-term sexual satisfaction.

### **Limitations**

Our study has shed important light on the mediation function of positive self-esteem in the relationship between infertility stigma and sexual satisfaction. There are, however, a few drawbacks to be aware of. It is essential to use caution when extrapolating the results from the unique group of infertile women. These results' applications may be impacted by cultural and contextual variables. Furthermore, our study ignored the potential significance of undiscovered variables by focusing primarily on self-esteem as a mediating component. Nevertheless, our study highlights the essential need to evaluate the psychological health of infertile women.

### **Conclusion and recommendations**

In conclusion, this study affirms that infertility in women within Egyptian culture is associated with a high level of stigma, leading to lower self-esteem and sexual satisfaction. However, women with higher self-esteem are better equipped to maintain sexual satisfaction despite elevated infertility stigma. Therefore, supporting and assisting these women in mitigating the psychological consequences of infertility is crucial. Additionally, interventions should not solely focus on reducing infertility stigma but should also aim to enhance the inner positive resources of infertile women, such as self-esteem, for long-term improvements in sexual satisfaction.

### **Implications in nursing practices**

Nurses can play a pivotal role in offering psychological support to infertile women. This support should address feelings of inferiority, loneliness, self-blame, and social isolation. Providing a safe and empathetic environment for women to express their emotions can be valuable. Nurses can educate infertile women about the potential impact of infertility on sexual satisfaction. It's essential to provide information and resources to help them navigate these challenges and explore ways to maintain a healthy sexual relationship. Understanding cultural norms and expectations is vital, especially in societies where a woman's social status is tied to childbearing. Nurses should tailor their care and interventions to respect cultural beliefs while providing support. Recognizing the positive correlation between self-esteem

and sexual satisfaction, nurses should work with patients to boost their self-esteem. Encouraging self-worth and self-acceptance can be a valuable part of the care plan.

### **Acknowledgments**

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### **Ethics approval and consent to participate**

All methods were carried out according to the relevant guidelines and regulations of the Declaration of Helsinki (DoH-Oct2008). The Research Ethics Committee of the Faculty of Nursing at Alexandria University granted ethical approval for the study in Egypt with reference number (IRB00013620/88/AU-20-5-99) at 26/7/2023. Each participant in this study gave informed written consent after being told of it's the study objectives.

### **Author contributions**

**Ayman Mohamed El-Ashry:** Conceptualization, preparation and collecting data of the study, preparation, data statistical analysis data curation, writing-original draft, writing-review & editing. **Eslam Abdelfattah Abdelhamid:** preparation and collecting data of the study, methodology, investigation, writing-review & editing. **Neama Saad Mahmoud Shoukhba:** Conceptualization, methodology, investigation, writing-original draft, writing-review & editing. All authors review and agreed to this copy of manuscript.

### **Competing Interests**

The authors declare that there is no conflict of interest.

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### **Availability of Data and Materials**

Data will be available from the corresponding author upon reasonable request.

### **Consent for Publication**

Not applicable.

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## الملخص العربي

### وساطة تقدير الذات في العلاقة بين وصمة العقم والرضا الجنسي لدى النساء المصابات بالعقم: دراسة منظور تمريضي

**المقدمة:** أولئك الذين يعانون من العقم يظهرون في كثير من الأحيان مستويات منخفضة من تقدير الذات وقد يواجهون صعوبات في قدرتهم الجنسية.

**الهدف من الدراسة:** التحقق من مدى تأثير تقدير الذات على العلاقة بين وصمة العقم ودرجة المتعة الجنسية لدى المرأة المصابة بالعقم.

**تصميم البحث:** تم إجراء تحليل ارتباطي وصفي متوافق مع STROBE.

**المنهجية وادوات البحث:** وبشكل ملائم، تم اختيار عينة مكونة من 200 امرأة تعاني من العقم على مدار ثلاثة أشهر، من يوليو إلى سبتمبر 2023. تم استخدام مقياس الرضا الجنسي، ومقياس روزنبرغ لتقدير الذات، ومقياس وصمة العار للعقم في الدراسة.

**النتائج:** كشف البحث عن وجود علاقة عكسية كبيرة بين وصمة العقم والرضا الجنسي. بالإضافة إلى ذلك، لوحظ وجود علاقة سلبية بين وصمة العقم واحترام الذات. وعلى العكس من ذلك، تم تحديد وجود علاقة إيجابية بين تقدير الذات والرضا الجنسي. كانت المستويات العالية من احترام الذات تنبئ بزيادة الرضا الجنسي، في حين كان انخفاض احترام الذات ينبئ بوصمة العقم. وعلاوة على ذلك، تم تحديد احترام الذات كوسيط جزئي في العلاقة بين وصمة العار والرضا الجنسي.

**الخلاصة:** ترتبط وصمة العقم بتقليل الرضا الجنسي وانخفاض احترام الذات. وجد أن تقدير الذات يلعب دوراً وسيطاً جزئياً في العلاقة بين وصمة العقم والرضا الجنسي.

**التوصيات:** تلعب الممرضات دوراً محورياً في تقديم الدعم للأفراد الذين يعانون من العقم من خلال التدخلات التي تهدف إلى تعزيز احترام الذات، وبالتالي تعزيز رفاههم العام والرضا الجنسي.