

Depression and Anxiety Among Infertile Moroccan Women: A Cross-Sectional Study in the Reproductive Health Center in Rabat

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Rec Date: June 29, 2018; Acc Date: July 17, 2018; Pub Date: July 20, 2018

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Abstract

Objective: To determine the prevalence and severity of depression and the level of anxiety among infertile Moroccan women in relation to sociodemographic and fertility-specific characteristics.

Methods: It is a cross-sectional study including 274 infertile women attending the Assisted Reproductive Technology Unit in the Reproductive Health Center of the University Hospital Ibn Sina in Rabat between June 2017 and February 2018. Two psychological tests were applied, the Beck Depression Inventory and the Hamilton Anxiety Rating Scale. Then, the association between the test scores and age, educational level, employment status, type of infertility, duration of infertility, and causes of infertility was examined.

Results: The study showed that 55% of the women had depression and 45.6% had mild to severe anxiety. Depression and anxiety scores were low in employed women compared to unemployed women ($p=0.002$; $p=0.006$). There was no significant relationship between depression and anxiety and women's age or type of infertility. Anxiety had a significant relationship with duration of infertility ($p=0.015$), cause of infertility ($p=0.034$) and educational level ($p=0.006$) while depression had no significant relationship with these factors.

Conclusion: The study findings showed that depression and anxiety were present in infertile Moroccan women and both were significantly associated with employment status while only anxiety was associated with educational level, duration and causes of infertility.

Keywords: Infertility; Depression; Anxiety; Woman's health

Introduction

Infertility that affects 10 to 15% of couples is a psychological, social and medical problem [1]. For childless couples, it is a personal tragedy and a deeply distressing experience [2-4]. Indeed, most marriages are contracted in order to have children [5]. Therefore, the inability to fulfil that goal added to the social and parental pressure to keep the family lineage can result in major psychological disorders [2,4]. In fact, studies have shown that the psychosocial stress was equivalent to that observed in patients suffering from cancer and coronary failure [6,7].

The social consequences of infertility differ between countries, cultures and religions. However, in many communities, women are still blamed for the infertility status of the couple and face, in consequence, disdain, neglect, social isolation, and sometimes domestic violence [1,4,5,8,9]. Up to 50% of infertile women describe infertility as the most difficult experience of their lives [6].

In Morocco, despite a growing awareness of infertility causes and treatment possibilities, people might still link infertility to women. Moreover, women labelled as infertile could be suffering from social stigmatisation and marital problems leading to divorce or polygamy.

The consequence of such social and mental pressure might be the occurrence of various psychological disorders. The general emotional responses to infertility are usually distress, anxiety and depression [1,10]. Indeed, Greil et al. observed in a 10-year review of the literature that distress in infertile women was higher than in fertile women [11]. Regarding depression, studies have found increased levels of depression in infertile women compared to fertile controls [1,10,12,13], and a similar pattern was reported regarding anxiety [1,10,13-15].

Although many studies have investigated the psychological consequences of infertility among women worldwide, there is, to our knowledge, no comprehensive research on the subject in Morocco. Thereby, the objective of the present study was to determine the prevalence and severity of depression and the level of anxiety among infertile Moroccan women in relation to sociodemographic and fertility-specific characteristics, and to compare the results with data from the various published studies. The results of this study will then provide more evidence for the growing public health efforts to promote a psychological support for these patients in order to improve their adherence to infertility treatments and also their overall quality of life.

Research Methodology

This study was a cross-sectional study conducted in the Reproductive Health Center of the University Hospital Ibn Sina in Rabat. The study subjects consisted of patients attending the Assisted Reproductive Technology Unit to undergo testing and receive infertility treatment. This unit is the main referral point for infertility problems in Morocco. It provides services for not only patients from Rabat, but also patients from various regions in Morocco. Only women who had been infertile for at least one year, and who attended the Assisted Reproductive Technology Unit for the first time were included in the study. The study was conducted from June 2017 to February 2018 where a total of 274 women was recruited. The patients with a previous history of mental illness or a prior intake of a psychotropic medication were excluded.

The study was approved by the Ethics Committee of Biomedical Research of the University Mohamed V of Rabat, Morocco. The participants were given extensive explanations on the purpose and utility of the study and were ensured that information about every participant would be confidential. Then, a signed informed consent was obtained from each patient.

Collected data included sociodemographic profile, namely age, education status and employment status. Primary infertility designated, the inability to conceive despite 12 months or more of regular unprotected sexual intercourse, while secondary infertility designated when a previous pregnancy was obtained, but the couple is subsequently unable to conceive irrespective of the pregnancy outcome. Whether the infertility was primary or secondary, history of pregnancy loss, duration of infertility and causes of infertility were also recorded.

Data regarding the psychological impact of infertility were collected using the Beck Depression Inventory and the Hamilton Anxiety Rating Scale.

The Beck Depression Inventory is a 21-item scale largely used to measure the intensity of depression [16]. In this study, the psychometric evaluation of depression was performed using the validated Arabic version of Beck's Depression Inventory [17,18]. It consists of 21 items, each describes a specific behavioural manifestation of depression. Scores on each item can range from 0, indicating no depressive symptomatology, to 3 indicating a severe level of symptomatology. Total scale scores can thus range from 0 to 63. Scores of 10 or above indicates a clinically significant depression with scores of 0 to 9 suggesting the absence of depression, 10 to 15 mild depression, 16 to 23 moderate depression, 24 to 36 severe depression and 37 or above extreme depression.

The Hamilton Anxiety Rating Scale is a widely used measure of the severity of anxiety symptoms [19]. The test used in the study was the validated Arabic version of the Hamilton Anxiety Rating Scale [20]. It consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety). Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0 to 56 with scores from 14 to 17 suggesting mild anxiety, 18 to 24 mild to moderate anxiety, 25 to 30 moderate to severe anxiety, and >30 severe anxiety.

The test results were statistically analyzed in order to investigate the association between test scores and age, educational level, employment status, type of infertility, duration of infertility, and causes of infertility.

The relationship between depression and anxiety scores and age and duration of infertility were determined using the Pearson correlation coefficient. The unpaired t-test was used to assess differences between employment status. Differences in educational level, type of infertility and causes of infertility were analyzed using one-way analysis of variance (ANOVA), followed by Bonferroni post hoc analysis. In all statistical tests, a value of $p < 0.05$ was considered significant. Data were analyzed using the Statistical Package for the Social Sciences version 13.0.

Results

Characteristics	n	%
Age		
<25	10	3.6
25-30	63	23
31-34	80	29.2
35-40	104	38
>40	17	6.2
Educational level		
No education	41	15
Primary	47	17.2
Secondary	110	40.1
University	76	27.7
Employment status		
Employed	80	29.2
Unemployed	194	70.8
Duration of infertility		
01-Mar	44	16.1
04-Jun	88	32.1
07-Sep	63	23
>9	79	28.8
Type of infertility		
Never conceived	218	79.6
Pregnancy loss	36	13.1
Live birth	20	7.3
Causes of infertility		
Female	81	29.6
Male	107	39.1
Both	28	10.2
Unexplained	58	21.2

Table 1: Characteristics of the study population.

Two hundred seventy-four women were assessed in this study. The mean age was 33.55 ± 4.8 years (range, 21-43 years). The infertility was primary in 218 (79.6%) cases and secondary in 56 (20.4%) cases. The mean duration of infertility at the time of the first medical consultation in the infertility unit was 7.65 ± 4.3 years (range, 1-21 years). Table 1 shows the characteristics of the study population.

The results of the Beck Depression Inventory showed that 55% of the women had depression symptoms while 45% had none. Among these patients, 22.6% had mild depression and 22.6% had moderate depression. Severe and extreme depression was found in 8% and 1.8% of the patients respectively. The level of severity of anxiety was measured by the Hamilton rating scale revealing that women had mild anxiety in 14.2% of cases, mild to moderate anxiety in 17.5% of cases

and moderate to severe anxiety in 7.3% of cases. Severe anxiety was found in 6.6% of women. The correlation between Beck and Hamilton scores based on Pearson's Rho was 0.702 ($p < 0.001$), which shows a significant positive relation between depression and anxiety scores. Regarding the women's age, there was no significant correlation between the age of the respondents and the depression and the anxiety scores.

On the other hand, the correlation coefficient between Beck and Hamilton scores with the duration of infertility showed a significant positive correlation between duration of infertility and Hamilton anxiety score while there was no relation between duration of infertility and Beck depression score (Table 2).

Variables	Beck Depression Inventory score		Hamilton Anxiety Rating Scale score	
	Pearson's Rho	p-value	Pearson's Rho	p-value
Women's age	-0.094	0.12	-0.057	0.344
Duration of infertility	0.068	0.259	0.147	0.015

Table 2: Correlation between depression and anxiety scores and duration of infertility and women's age.

The unpaired t-test showed a significant difference between depression scores and anxiety scores of employed and unemployed women.

The mean score of depression by educational level showed that women with no formal education tended to be more depressed than those who at least had some form of education with the level of depression decreasing with higher education, even though this trend was not statistically significant as shown in Table 3.

In contrast, there was a statistically significant difference between the mean score of anxiety by educational level. The Bonferroni post

hoc test revealed that patients with no education had higher anxiety scores than did patients with secondary education ($p = 0.004$).

The comparison of the mean score of depression in the different groups of infertility causes found no statistically significant difference between the four groups whereas, a statistically significant difference was noted between the mean score of anxiety by infertility causes. The Bonferroni post hoc test revealed that patients with a female cause of infertility had higher anxiety scores than did patients with unexplained infertility ($p = 0.03$) (Table 3).

Variables	Beck Depression Inventory score		Hamilton Anxiety Rating Scale score	
	Mean \pm SD	p-value	Mean \pm SD	p-value
Employment status				
Present	9.5 \pm 7.73	0.002†	11.03 \pm 8.833	0.006†
Absent	13.19 \pm 9.468		14.56 \pm 9.907	
Educational level				
No education	14.88 \pm 9.621	0.053*	17.85 \pm 10.843	0.006*
Primary	13.26 \pm 9.741		14.55 \pm 9.906	
Secondary	11.85 \pm 9.473		11.85 \pm 8.937	
University	10.28 \pm 7.575		12.99 \pm 9.483	
Type of infertility				
Never conceived	11.81 \pm 9.267	0.525*	13.09 \pm 9.186	0.167*
Pregnancy loss	13.61 \pm 9.091		16.39 \pm 12.922	
Live birth	12.7 \pm 7.801		13.2 \pm 8.339	

Causes of infertility				
Female	13.49 ± 11.108	0.057*	15.63 ± 11.170	0.034*
Male	12.19 ± 8.161		13.02 ± 9.029	
Both	13.39 ± 8.284		14.75 ± 10.215	
Unexplained	9.41 ± 7.705		10.95 ± 7.904	
Test p-value using t-test† or ANOVA*				

Table 3: Relation between depression and anxiety scores and the population characteristics.

Discussion

In the present study, we explored the hypothesis that Moroccan infertile women suffer from depression and anxiety like women in other countries and that these psychological disorders increase with the duration of infertility. We also explored the hypothesis that employment status and educational level have a protective effect on depression and anxiety in infertile women. In addition, the relationship between the cause of infertility and depression and anxiety was investigated. This study showed that depression and anxiety were expressed by infertile Moroccan women and both were significantly associated with employment status while only anxiety was associated with educational level, duration and causes of infertility.

The prevalence of depression in the present study was 55%, which is comparable to the prevalence found in studies conducted in India and Saudi Arabia with depression rates of 56.4% and 53.8% respectively [7,21]. However, other studies reported higher levels of depression in infertile women with a rate of 67% in China and 62% in Ghana [4,7]. In contrast, the rates of depression were 40.8% in infertile women in Iran and 35.44% in infertile women in Poland [3,22]. These findings were low as compared to our study. The severity of depression in infertile women has also been investigated in several studies. For instance, Jones et al. reported 28.3% of mild to moderate depression, 7.2% of moderate to severe depression and 1.2% of severe depression [3,21]. Whereas, in this study, 22.6% of women had mild depression and 22.6% had moderate depression. Severe and extreme depression were found in 8% and 1.8% of the patients respectively.

In a study conducted by Guerra et al., 67% of infertile women had anxiety symptoms [23]. A Chinese study assessing anxiety in infertile women found different levels of mental pressure in 83.8% of infertile women, and moderate or severe types in 25% [3]. In our study, women had mild anxiety in 14.2% of cases, mild to moderate anxiety in 17.5% of cases, moderate to severe anxiety in 7.3% of cases and severe anxiety in 6.6% of cases.

In the Moroccan society, having a child is highly valued, therefore infertility is accompanied by negative attitudes toward the childless women. Isolation, stigmatization, verbal and physical abuse, and marital instability (divorce or polygamy) can lead to psychological problems in infertile women. This could explain the relatively high prevalence of depression and anxiety found in the present study.

After the age of 35 years female fertility decreases in an accelerated downward trend [4]. The awareness of this negative impact of age on their fertility might add more pressure on infertile women and thereby could result in psychological manifestations. However, in this study no relationship was found between women's age and depression and/or

anxiety. Results from other studies were different. Some studies have shown that age was not associated with depression and/or anxiety while others have found a significant relationship between them [1,3,4,9,10,13,21]. In Maroufizadeh's study, age was negatively associated with anxiety while there was no significant relationship between depression and age [24].

Many studies reported a protective effect of education on depression and anxiety [7]. Indeed, studies have found a negative correlation between anxiety and/or depression and educational level [3,7,24]. These findings are similar to our results concerning anxiety. In contrast, no significant relationship was found between depression and educational level in the present study even though women with higher educational levels had lower depression scores. Similar results were found in studies conducted in Turkey and Saudi Arabia [1,21].

Another protective factor is employment. In many societies, childbearing is still considered the major role of a woman. Therefore, the inability to conceive might be perceived by women as a failure to achieve their main purpose in life and thereby lead them to a feeling of uselessness, low self-esteem and lack of confidence. Having a job may give women other purposes in their lives and therefore be the gate to joyful aspects of their lives other than maternity [4,25]. This may explain why employed women had less signs of depression and anxiety than unemployed participants, in the present study. These findings were similar to other reports who have found a similar trend [3,7].

The present study showed a significant positive correlation between duration of infertility and anxiety while there was no relation between duration of infertility and depression. These findings are different from those observed in other countries. Indeed, many studies have investigated the duration of infertility and its relation to depression and/or anxiety leading to conflicting results. Several studies have shown that anxiety and/or depression increases with the duration of infertility whereas, others have found that anxiety and/or depression symptoms decrease with the duration of infertility [1,3,4,7,13]. In Domar's study, depression scores were the highest during the third year and then slowly decrease to reach normal levels after the sixth year [26]. Moreover, studies conducted in Japan, Turkey and Iran have found no significant association between duration of infertility and anxiety and/or depression [1,9,24,25]. This discrepancy in results is probably due to cultural, social, and religious differences between countries. In Morocco, the psychological burden of infertile women increases with the duration of infertility because as time goes by expectations and hope for a positive outcome after treatment begin to fade while the social pressure continues to rise [4]. The reduction of the psychological stress noted in other studies might be explained by the fact that women, after a length of time, will start thinking about other alternatives such as adoption or "Childfree" living [26]. In our

society, adoption is not well accepted neither by the infertile couple who wants to have their own biological child, nor by the extended family who view children as a mean to maintain the family lineage [4].

The relationship between the occurrence of depression and/or anxiety symptoms and the type of infertility was also investigated in this study. However, although women with a history of pregnancy loss had higher scores of depression and anxiety, no statistically significant difference was found. This finding was consistent with the results found by Domar et al. [26]. In contrast, in Alhassan's study, women with primary infertility had more psychological signs of depression [4].

In this study, depression scores were the lowest when the cause of infertility remained unexplained. However, this result was not statistically significant. Similar results were reported by Maroufizadeh et al. who found no significant relationship between depression and the cause of infertility [24]. On the other hand, our study found a significant association between anxiety and the cause of infertility with the lowest mean score found in unexplained infertility and the highest in female infertility. In many societies, women are held responsible for the couple's infertility, therefore when the male partner is infertile, the women's psychological stress diminishes [25]. Indeed, a Japanese study has reported that women who were aware of their male partner's infertility had decreased anxiety scores compared to those who did not know [25]. In addition, in another study a known cause of infertility was associated with a significant elevation of depression scores compared to unexplained infertility [26]. For infertile patients, having a definite diagnosis leaves no place for speculation while in the case of unexplained infertility an optimistic prognosis is still possible. This might explain the low scores of depressions found in the cases of unexplained infertility [26].

The main limitation of the study is the fact that it is a cross-sectional study conducted in a single fertility center. Therefore, the findings cannot be extrapolated to the general population, even though the center is the first public fertility center in Morocco and the patients came from various regions across the country. In addition, the study included women who came to the center seeking medical care; therefore, women who did not or could not seek medical care were not evaluated in this study and might have different levels of depression and anxiety than the study group. Moreover, the majority of the patients were referred to the center to have an *in vitro* fertilization treatment. It is, therefore difficult to distinguish between the psychological distress due to infertility and the one due to the apprehension of the *in vitro* fertilization treatment.

Conclusion

The social and mental pressure associated with infertility can be responsible for various psychological disorders mostly anxiety and depression. This study showed that these conditions were expressed by infertile Moroccan women and both were significantly associated with employment status while only anxiety was associated with educational level, duration and causes of infertility. However, additional studies are required to investigate each factor and its relation to psychological disorders in infertile Moroccan women allowing, in consequence, a more accurate identification of potential patients in need of psychosocial interventions. In addition, the study findings highlighted the necessity of a combined management of women attending infertility clinics associating professional psychological assistance with infertility treatments. Therefore, establishing psychological services, which are presently not available in infertility centers, will improve the

accessibility to these interventions and the psychological health of these patients.

Acknowledgements

The authors are grateful to the staff and patients of the Assisted Reproductive Technology Unit in the Reproductive Health Center of the University Hospital Ibn Sina for their support and participation in the study.

Disclosures

Authors have no conflict of interests, and the work had no financial support.

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