Original Article

The Effect of Nursing Consultation Based on Orem's Theory of Self-care and Bandura's Concept on Infertility Stress

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ABSTRACT

Introduction: Infertility is one of the most stressful experiences in a couple's life. Several approaches have been proposed to manage infertility stress during the medically assisted technology process. **Objective:** The objective was to examine the effect of nursing consultation on the stress experienced by infertile couples before starting infertility treatment. **Materials and Methods:** This cross-sectional study was conducted from November 2017 to November 2018 among 120 infertile couples (240 patients) for whom stress was assessed. One hundred and thirteen patients of them who had a high infertility stress level were invited to participate in this randomized study (57 were assigned to the control group and 56 were included in the intervention group). The intervention group received nursing consultation based on Orem's theory and Bandura's concept in addition to the routine nursing care. Perceived Stress Scale-10 (PSS-10) and General Self-Efficacy Scale (GSES) were used before and after nursing intervention. **Statistical Analysis:** The Chi-square test followed by a paired t-test and independent t-test was used for data analysis by SPSS software (version 20). **Results and Discussion:** There were no statistically significant differences before nursing intervention between the two groups in terms of PSS-10 ($t = 1.18$, $P = 0.23$) and GSES ($t = -0.40$, $P = 0.689$) scores, but a significant difference emerged in the intervention group following the nursing intervention: a reduction of the PSS score ($t = -8.91$, $P = 0.000$) and an increase in the GSES score ($t = -5.25$, $P = 0.000$, with 95% confidence interval (CI)). **Conclusion:** Nursing consultation has been shown to be beneficial in decreasing perceived stress and increased self-efficacy for infertile couples undergoing assisted reproductive technologies.

KEYWORDS: *Assisted reproductive technologies, infertility stress, nursing consultation*

INTRODUCTION

Infertility is defined as the failure to conceive after 12 months of regular sexual intercourse without contraception.[1] It is estimated to affect approximately 72.4 million couples worldwide.[2] Several studies have found that couples classify infertility as the most upsetting and extremely stressful experience of their life.[3,4] Infertility can negatively affect couples physically, emotionally, and socially.[5] To avoid this stress and life crisis, people start searching for treatment alternatives, and most of the time, assisted reproductive technology (ART) is considered as a solution. Nevertheless, this alternative is also a source of big stress.[6,7] His daily injection, semen analysis, numerous sonography occasions, long-waiting lists, and financial costs have been repeatedly announced as factors of psychological stress by people seeking infertility treatment.[8] Hence, the diagnosis and treatment approaches make harder for infertile couples to cope,[9]

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especially for women who need more professional help and support both along the treatment process and in the treatment failure.[10] Psychological support and ideal nursing consultations such as stress management, cognitive-behavioral intervention, and self-help groups were an important way to make infertile patients ready to face this hard experience.[8] Nurses working in the field of infertility aim to help such individuals to cope with these adverse effects and increase their well-being.[11] Then, couples can manage their infertility crisis using these coping strategies since the diagnosis announce.[12] Actually, there is an international agreement that fertility centers need to have necessary counseling programs for psychological problems of infertile couples.[13] This is why it is crucial, on the one hand, to be able to determine the extent to which couples are affected by infertility stress at the beginning of the care process and, on the other hand, to develop a nursing consultation model to help them to start treatment successfully. In our country, no study has yet addressed the subject of infertility nursing consultation and its effects on couples' stress. This is the purpose of this study to evaluate the effectiveness of a nursing consultation protocol based on Orem's theory and Bandura's concept of the stress experienced by infertile couples. This model was developed by the researcher according to a scientific approach adapted to our context. The results of this study can be used to psychologically prepare infertile couples to start their treatment successfully and thus improve their therapeutic results.

Conceptual approach of nursing consultation

It is essential to base nursing care on an established theoretical framework to improve treatment outcomes.[14,15] In this sense, we used Orem's theory of self-care[16] and Bandura's concept[17] as a guide for developing a framework of nursing intervention to care for infertile couples. Orem's theory of self-care is based on the idea that everyone has the potential to develop their autonomy and skills and maintain their motivation to manage their health.[18] In a context of infertility, the nurse guides the person to mobilize their intellectual and especially emotional capacities to make a decision and manage stress in order to respond to their care. This refers to Orem's theory. To do this, the patient must first have a good confidence in his or her personal abilities to perform all tasks related to stress management. This second notion refers to Bandura's concept of self-efficacy. The feeling of self-efficacy corresponds to the person's judgment on his or her ability to organize and carry out actions to achieve the required level of performance.[19,20] Historically, infertility and its treatments have reduced the perception of self-efficacy in individuals and especially in women[21,22] Similarly,

Cousineau *et al*. argue that the perception of self-efficacy influences the ability of women, in particular, to adapt to infertility.[23] The nurse can help the persons to increase their perception of self-efficacy by managing their own care and emotions and making the right decisions that affect their health, a key concept of nursing.[24] Thus, in infertility context, Orem's nursing design and Bandura's concept of self-efficacy complement each other through their influence on health behaviors to help infertile patients in feeling able to manage their stress. They, therefore, form the conceptual and theoretical basis of the nursing consultation approach evaluated in this study.

MATERIALS AND METHODS

This is a quasi-experimental study conducted in the first public fertility center in our country, which is located at the reproductive health hospital, which is a national reference center for ART. This study was approved by the Ethics Committee of the Faculty of Medicine. Informed written consent was obtained from each participant after explaining the purpose of the study. The ethical principles that originated in the World Medical Association's Helsinki Declaration and all applicable local laws, rules, and regulations relating to the conduct of the study were followed.

Study participant

The study sample includes all infertile couples (120 couples, 240 patients) who visited the fertility center of the reproductive health hospital between November 2017 and November 2018 and who met all inclusion criteria. Couples aged 19–50 years who were first diagnosed in the center and who agreed to participate were included in this study. The study excluded foreign couples and couples who are under treatment for psychopathology.

Data collection

The study was conducted in two steps during the diagnostic phase and before infertility treatments began. In the first step (pre-test), before nursing consultation, 240 consenting patients were asked about relevant sociodemographic and clinical variables using a semi-structured questionnaire developed by the author, and they were assessed for the presence of high infertility stress and a perceived level of self-efficacy using two scales, respectively: the Perceived Stress Scale-10 (PSS-10) and the General Self-Efficacy Scale (GSES). The filling time takes between 3 and 7 min and can be applied individually or in the groups. After obtaining the results of the pretest evaluations of the first step, the author focused on 113 patients who experienced high infertility stress and who have been invited to participate in the second step of the study after obtaining their consent. They were randomly numbered from 1 to 113. Patients with even numbers were assigned

to the intervention group of 56 patients, and those with odd numbers were assigned to the control group of 57 patients [Figure 1].

The intervention group received a structured nursing consultation process [Table 1] in addition to the routine nursing services. In contrast, control group participants received only routine nursing services such as descriptions of medical treatment procedures and information on the costs of their therapy. Patients in the control group did not participate in the nursing consultation program. After nursing consultation, both the groups were administered posttest measures: the PSS-10 and the GSES questionnaire. The time between the pretest and posttest measures was about 12 days.

Intervention of the nursing consultation

This intervention provides a series of health education sessions to assist infertile patients in correcting their unhealthy habits and strengthening their feelings on self-efficacy ito reduce their stress, which is our focus in the present study. The content of this educational nursing
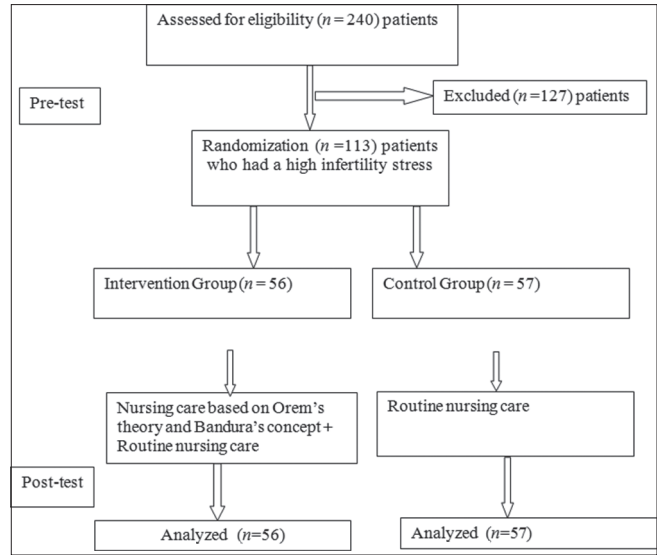

Figure 1: CONSORT diagram showing participant flow through the study: This chart illustrates the process of recruitment and attrition of research participants. 127 participants were excluded from the study because. the author is interested in participants who had a high infertility stress score, (PSS >= 31). None of the participants dropped out of the study

Table 1: The nursing consultation Process based on Orem's theory and Bandura's concept

Session	Objectives	Content	Duration	Sources of influence addressed
Session 1 (Individual session) - Establishing first contact with the patient	-To know the needs of patients -To explain the progress of the session program	-Expression of difficulties encountered, and setting of personal expectations and objectives -Program of consultation	30 min	Performance achievement
Information, Education, Communication (IEC) (Group session)	- To describe infertility -To describe Assisted Reproductive Technologies	-Infertility: Definition-types-signs - Different ART techniques -Methods of care -Questions and Answers	30 min	
Session 2 (IEC) According to the person's needs (Group session/Individual Session)	-To de scribe Stress - To manage of infertility stress	-Stress: signs, consequences on fertility -Stress management techniques, self-control -Environnemental adaptation stratégies	15 min 30 min	-Performance achievement -The vicarious experience -Verbal persuasion
	-To evaluate the achievement of the personal objectives developed at the beginning of session -To assess the ability to manage one's illness at home	-Evaluation of objectives -Self-assessment of the achievement of personal objectives	15 min	Self-assessment
Session 3 Information Education Communication (IEC)	-To know the nutriments that are beneficial to reproductive health	-List of nutriments beneficial to fertility and those that affect fertility	15 min	-Performance achievement - Verbal persuasion
	-To improve certain habits and behaviors/patient relationship	- Description of some beneficial behaviours	15 min	The vicarious experience
	-To consolidate the information obtained during the two sessions	- Summary of achievements	10 min	-Performance achievement -The vicarious experience
	-To evaluate the ability to manage one's illness at home -To evaluate patient stress	- Evaluation of the objectives achieved during these 2 sessions -Explanation of the phone call process	20 min	- Self-assessment

Table 2: Demographic characteristics of intervention group and control group			
Variables	**Intervention Group (*n*=56) *n* (%)**	**Control Group (*n*=57) *n* (%)**	***P***
Sex			0.449 (NS)
women	34 (60.71)	30 (52.63)	
men	22 (39.28)	27 (47.36)	
Age (years)			0.950 (NS)
24-32	4 (7.1)	5 (8.8)	
33-39	21 (37.5)	21 (36.8)	
>=40	31 (55.4)	31 (54.4)	
Level of education			0.878 (NS)
Primary school or less	15 (26.8)	16 (28.1)	
High school or over	41 (73.2)	41 (71.9)	
Employment status			0.791 (NS)
Employed	36 (64.3)	38 (36.7)	
Unemployed	20 (35.7)	19 (33.3)	
Perceived income level			0.557 (NS)
Middle or low income	49 (87.5)	52 (91.2)	
High income	7 (12.5)	5 (8.8)	
Smoking status			0.563 (NS)
Yes	5 (8.9)	7 (12.3)	
No	51 (91.1)	50 (87.7)	
Alcohol status			0.395(NS)
Yes	5 (8.9)	8 (14)	
No	51 (91.1)	49 (86)	
Inadequate sleep			0.629(NS)
Yes	40 (71.4)	43 (75.4)	
No	16 (28.6)	14 (24.6)	
Sport activities			0.774(NS)
Yes	11 (19.6)	10 (17.5)	
No	45 (80.4)	47 (82.5)	
Infertility Type			0.106(NS)
Primary	48 (85.7)	54 (94.7)	
Secondary	8 (14.3)	3 (5.3)	
Duration of infertility			0.678(NS)
<7 years	9 (16.1)	6 (10.5)	
Between 7 and 8 years	15 (26.8)	17 (29.8)	
More than 8 years	32 (57.1)	34 (59.6)	
Etiologies of infertility			0.764(NS)
Inexplained	12 (21.4)	13 (22.8)	
Female factors	26 (46.4)	26 (45.6)	
Male factors	15 (26.8)	17 (29.8)	
Combined factors	3 (5.4)	1 (1.8)	
High Perceived infertility stress s			1.00 (NS)
Oui	56 (100)	57 (100)	
Non	0	0	
High General self-efficacy scale			0.798(NS)
High self-efficacy	8 (14.3)	47 (82.5)	
No high self-efficacy	48 (85.7)	10 (17.5)	

NS=No significative

consultation uses the four sources described by Bandura to influence infertile patients' sense of self-efficacy: performance achievement, vicarious experience, verbal persuasion, and self-evaluation.

The intervention will be provided by the author of the research and two experienced nurses. The content will be composed of different topics including simple messages and targeted information on basic infertility care, which allow couples to manage their stress and self-care behaviors. This program is divided into three sessions of 1 h each, 1 week apart. Active methods of teaching Arabic posters accompanied the content of these

Table 3: Pre-test and posttest Perceived stress, and General self-efficacy scores in intervention group and control group

Scales	Groups				Pre-test		Posttest	
	Intervention group (*n*=56)		Control group (*n*=57)		*t*	*P*	*t*	*P*
	Pre-test mean (SD)	Posttest mean (SD)	Pre-test mean (SD)	Posttest mean (SD)				
PSS-10	32.96 (1.819)	25.07 (6.19)	32.58 (1.625)	32.63 (1.611)	1.18	0.23	-8.91	<0.001
t and *P*	*t*=9.426, *P*<0.001		*t*=-1.764, *P*=0.083					
GSES	22.59 (5.396)	29.23 (5.743)	23 (5.48)	23.5 (5.834)	-0.40	0.689	5.25	<0.001
t and *P*	*t*=-6.888, *P*<0.001		*t*=-1.361, *P*=0.179					

educational sessions: discussions, computer-assisted presentation, and guides [Table 1].

Measures

Sociodemographic assessment

It is a form with 13 questions developed by researchers to obtain data on fertility and sociodemographic characteristics of participants.

Perceived Stress Scale assessment

This adapted scale of Cohen and Williamson is one of the most used for assessing the perception of stress level.[25] It was the subject of various translations including the classical Arabic language.[26,27] It is composed of ten items and answer choices ranging from 0 to 4 for each item. The score is obtained by first reversing the scores of the positive items which are 4, 5, 7, and 8, where 4 = 0, 3 = 1, and 2 = 2. The total score is the sum of scores obtained from 0 to 40 points. The result will be indicated by the interpretation of the obtained score. The perceived stress is normal if total score obtained ranges of 0–10 points; it is weak of 11–20 points, moderate of 21–30 points, and high of 31–40 points.

The General Self-Efficacy Scale

The General Self-Efficacy Scale (GSES) was created to assess perceived self-efficacy regarding coping and adaptation abilities in both daily activities and in stressful events. It was translated and validated in French and Arabic.[28] It includes ten statements that must be evaluated by participants on a Likert-type scale with four levels between 1 and 4, where 1 is completely false and 4 is totally true. The overall self-efficacy score is obtained, which represents a stable dimension of personality.[29] Internal validity was verified for different populations with 0.87 of mean alphas.[30] Initial results for a number of usable questionnaires of 841 showed an average score of 29.94 points, with a minimum score of 15 points and a maximum score of 40 points. The median is 30 and the standard deviation (SD) is 3.89.[31] The filling time takes between 3 and 7 min and can be applied individually or in the groups.

Samples size and statistical analysis

Anticipating the prevalence of infertility stress in infertile couples as 50%, the minimum number of participants required for this study using the formula developed by Schwartz[32] was observed to be 96 patients for a relative precision of 10% and 95% confidence level. The sample included all infertile couples attending the fertility center, which is 120 couples (240 patients) during the study period. Data were collected, and the analysis was performed using SPSS (SPSS Statistics for Windows, Version 20.0, Released 2011, IBM Corp, Armonk, NY, USA). We determined statistical methods after assessing the shape of the data distribution. The Kolmogorov–Smirnov test confirmed that the data were not normally distributed. Relations between the groups and the categorical variables were analyzed by the Chi-square test. Pre- and posttest values of the scales were compared by the paired samples *t*-test. Differences between the groups were analyzed using the independent samples *t*-test. $P \leq 0.05$ was considered statistically significant.

RESULTS

Among the 113 stressed patients, we have 49 (43.4%) men and 64 (56.6%) women. After randomization, we compared the groups on sex, age, level of education, employment status, perceived income level, smoking status, alcohol status, inadequate sleep, sports activities, infertility type, etiologies of infertility and duration of infertility, high perceived infertility stress, and high general self-efficacy to confirm homogeneity. The Kolmogorov–Smirnov test confirmed that the data were not normally distributed; therefore, Chi-squared tests showed that patients in the intervention and control groups were statistically similar ($P > 0.05$) and homogenous [Table 2].

Findings on infertility Perceived Stress Scale

The intervention group showed a significant decrease ($t = 9.426$ $P < 0 001$) in PSS-10 scores between pretest (mean = 32.96, SD = 1.819) and posttest (mean = 25.07, SD = 6.19). In the control group, differences between PSS pretest (mean = 32.58, SD = 1.625) and posttest (mean = 32.63, SD = 1.611) scores were not significant ($t = -1.764$, $P = 0.083$). PSS scores were similar between the two groups prior to the intervention of nursing consultation ($t = 1.18$, $P = 0.23$) but significantly differed after this intervention ($t = -8.91$, $P < 0 001$) [Table 3].

Findings on General Self-Efficacy Scale

The intervention group exhibited a statistically significant difference ($t = -6.888$, $P < 0.001$) in the mean of GSES scores between pretest (mean = 22.59, SD = 5.396) and posttest (mean = 29.23, SD = 5.743). In the control group, the difference between GSES mean in pretest (mean = 23, SD = 5.48) and posttest scores (mean = 23.51, SD = 5.834) was not found to be significant ($t = -1.361$, $P = 0.179$). There was no difference between the groups in terms of GSES mean scores prior to the intervention of nursing consultation ($t = -0.40$, $P = 0.689$), but a significant difference emerged following this intervention ($t = 5.25$, $P < 0 001$) [Table 3].

DISCUSSION

In our country, having children is very important for the stability of any couple. The expectations of society, family, and friends put the couple, especially the woman, in a very embarrassing situation. This finding was demonstrated by our results. The prevalence of high infertility stress indicated that women were more stressed than men at the time of diagnosis of infertility. This result is consistent with studies conducted by Allan and Cousineau and Domar in 2007,[33,34] Luk and Loke,[35] Dooley *et al*.,[36] and El Kissi *et al*.[37] which had also shown that women are more stressed than men. Indeed, nurses are in an ideal position to address this problem by providing personalized care, advice, and referrals to support services for infertile couples.[38] They play an important role in helping couples who wish to start ART techniques to improve their physical, psychological, and social well-being and improve treatment outcomes. One of the characteristics of effective nursing care is the ability to provide compassionate, comprehensive, and evidence-based health care[39] that has demonstrated that nurses play an essential role in the reproductive health of infertile couples.

In this study, we used Orem's theory of self-care (1991) and Bandura's concept (1997) to develop this nursing intervention care framework. Orem's theory (1991) is based on the idea that everyone has the potential to develop self-care and to maintain motivation to manage their health.[18] In this respect, the infertile patient must have a good confidence in his personal abilities and acquire all the necessary techniques to adapt to his environment and manage his stress. Stress self-management is a field of self-care for infertile patients; this notion refers to Bandura's (1997) concept of self-efficacy.

The result of our study showed that the perceived stress level in post-test decreased in the intervention group who received education and stress management sessions during the nursing consultation. However, this perceived stress level in post-test did not decreased in the control group who didn't receive these sessions. This result is in line with Terzioglu's finding in 2001,[40] which showed that education has much helped stressed couples to adapt to the treatment and reduce their stress.

Our study also supports evidence of the impact of cognitive-behavioral intervention which is another form of education and information for behavior change that reduces high perceived infertility stress levels.[41]

In this sense, another study conducted by Hampton *et al*. in 2012 showed that the lack of fertility information and education among most women seeking help with health reproductive procedures can be a contributing cause of infertility and a predictor of stress due to poor fertility knowledge.[42] Although the perception of self-efficacy was similar in both the groups prior to the educational counseling sessions, a significant difference in the perceived self-efficacy score was found in the intervention group compared to the control group ($t = 5.25$, $P < 0.001$) confirming the positive effect of the nursing consultation intervention based on the Orem's theory and the Bandura's psychosocial concept on infertile patients.

Furthermore, the results of this study showed that when the PSS-10 score decreases, the self-efficacy score increases, and thus people with a high level of self-efficacy are less vulnerable to stress. The same result was confirmed in a study conducted by Bandura who showed the interrelationship between self-efficacy and emotions. Furthermore, this finding is consistent with Fida's study which has shown that believing in self-efficacy can reduce the influence of stressful conditions and mediate between stressors and negative emotions.[43] Furthermore, in another context, Gallagher demonstrated in his study that the effect of cognitive-behavioral therapy on panic is also attributed to self-efficacy to some extent,[44] and this affirms the very positive effect of our nursing consultation intervention based on the Orem's approach and the Bandura's concept. On the other hand, our results were also demonstrated by Cousineau's study *et al*. in 2006 which showed that individuals' confidence in their own effectiveness in coping with and managing the difficulties associated with their infertility treatment would have very positive results in reducing their perceived stress.[23] This finding may be due to the fact that people with high self-efficacy exhibit a more positive emotional state and healthier behavior than people with low self-efficacy.[45] This result may explain why a strong sense of self-efficacy improves personal achievement and encourages people to have high

aspirations and a strong commitment to achieving their goals.[46] To our knowledge, no researcher has reported the results of an intervention aimed at reducing stress in infertile patients according to Orem's self-care theory and Bandura's concept.

CONCLUSION

The results of this study indicate that the infertility nursing consultation based on the Orem's theory and the Bandura's concept plays an important role in the proper preparation of infertile couples to begin infertility treatment. It facilitates the effective management of negative feelings by reducing the perceived level of infertility stress while increasing the overall level of self-efficacy. Therefore, the nursing consultation should be scheduled from the beginning of infertility treatment and continue until the end of the pregnancy, whether or not the pregnancy is successful.

Implications of the results of this study

This research provides important results in the field of nursing care based on Orem's theory of self-management of health and Bandura's concept of self-efficacy for the benefit of infertile patients who wish to begin assisted reproductive technologies.

It has reduced the stress associated with infertility and increased the perception of self-efficacy for better adaptation to the disease. Thus, these results must be used to influence policy, practice, research, and education through nurses. Nurses should consider using Orem's theory and Bandura's concept to better treat couples and prepare them for infertility treatments. They should also increase their knowledge of stress management and disease adaptation techniques and generalize this model in ART centers. Future research should explore the experience of patients receiving nursing care according to this model throughout the ART management process.

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Conflicts of interest
There are no conflicts of interest.

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