

Resilience, Distress and Hope among Infertile Women Undergoing *In vitro* Fertilization (IVF) Treatment: a Correlation Study

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Abstract: Infertility is undeniably a major life crisis for many couples. Infertile couples are therefore increasingly seeking to recover from this life crisis and often turn to *In vitro* Fertilization (IVF) as a solution. Being resilient and, having a hope are psychological resources that help the infertile women to cope with their psychological distress. This study aimed to determine the relationship between resilience, distress and hope among infertile women undergoing IVF treatment. A descriptive correlational research design was followed in this study. This study was carried out in IVF unit at Madina Women's Hospital in Alexandria Governorate, Egypt. A convenience sample of 170 infertile women who undergoing IVF and available at the time of data collection were recruited from the above mentioned setting. Four tools were used for collection of basic data namely, "A Structured interview schedule", "Infertility Distress Scale", "Connor-Davidson Resilience Scale (CD-RISC)" and "State Hope Scale (SHS)". Results revealed a statistically significant positive correlation between infertile women's hope and their resilience total score. In addition, a statistically significant negative correlation was found between infertile women's hope and their level of psychological distress. Previous IVF and previous experience of abortion or history of child's death were factors-increasing infertile women's hope. It can be concluded that infertile women psychological distress might be significantly decreased along with increasing their resilience and instilling their hope. *Recommendations* encompassed that Instillation of hope psychological counselling sessions is suggested for infertile women during treatment cycles. Nurses are advised to assess infertile women level of resilience and help them to be resilient through educating both couples how to adapt and cope with infertility problems.

Key words: Infertile Women • IVF • Hope • Resilience • Distress

INTRODUCTION

Infertility is a widespread problem that has an emotional, social and economic impact on couples and society [1]. According to the reports of the International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) [2-4], "infertility" is a couple's failure in pregnancy after 12 months of unprotected sexual intercourse and pregnancy attempts. According to the statistics; annually 60-80 million couples around the world suffer from infertility [2].

Epidemiological data indicate that infertility is estimated to involve as many as 186 million people worldwide. Although male infertility contributes to more

than half of all cases of global childlessness, infertility remains a woman's social burden. It is viewed by experts in the battlefield to be a problem that affects 15to 20% of couples [5]. In Egypt, Mohsen *et al.* [6] had reported that the prevalence of the primary and secondary infertility was 2.5% and 7.9%, respectively. They added that, the overall prevalence of infertility was 10.4%.

There are two types of infertility, primary and secondary. Primary infertility refers to couples who have never conceived a pregnancy. While secondary infertility refers to couples who have experienced difficulty in conceiving subsequent pregnancies after prior, successful conception. More couples experience secondary infertility than primary infertility. Data indicate that roughly 70% of women with infertility have had at

least one previous pregnancy and more than one-third of them experience difficulties in conceiving a second child [7].

Causes of infertility could be primary or secondary. Primary Causes include congenital defects or reproductive system diseases; hormonal disorders; genetic factors and genetic disorders. Secondary causes include: lifestyle related factors such as diet, obesity, alcohol consumption, smoking and chemical environments. Other, secondary causes are related to human infertility such as unsafe methods of childbirth and post-partum period as well as symptoms of sexually transmitted diseases [8, 9].

There are several treatment modalities for infertility in case of medical interventions, among which, is in vitro fertilization focused treatment (IVF) which enjoys a good reputation and more applications. It is a medical procedure in which a mature egg cell is taken from women and is fertilized with man's sperm outside the body and the resulting embryo is implanted in the womb of the woman or another woman to continue the normal pregnancy [10].

Infertility is considered a crisis in the couple's life. This crisis is usually accompanied by physical, psychological and social consequences, which in turn have a negative effect on the all aspects of infertile couple's life [11]. Infertile couples are therefore increasingly seeking to recover from this life crisis and often turn to in vitro fertilization (IVF) for solutions. In the beginning of the treatment, couples are hopeful that a pregnancy will occur [12]. However, success is not a given, repeated treatments may be needed before fertilization is achieved. For the presence of recurring need for treatment from couples, it is important for health professionals to evaluate how women can adapt to unsuccessful outcomes. In fact, this early assessment may be the key to prepare them to cope with feelings of failure, loss, hopelessness and regain the emotional energy to initiate retreatment. This early assessment is also necessary because there is evidence that women cannot get pregnant if they are emotionally distressed during treatment [13].

The experience of having children is linked to every human life in the hope of a better, more beautiful and more productive future; it is not linked to a faceless state, mental confusion and frustration, especially among women. Experts say that women undergoing in vitro fertilization treatment are worried and often suffer from depression during treatment cycles that lead to failure [3]. Several studies had indicated that infertility is considered as a crisis that could threaten the stability of individuals and has always been associated with a variety of psychological problems, such as: anger, anxiety, stress,

depression, obsession, decrease in sexual function and ultimately, disappointment [10, 14, 15, 16].

Infertility, in addition to somatic and sexual disorders, is associated with enormous negative psychological and mental burdens for both infertile men and women [17]. The typical psychological problems caused by infertility include: anxiety, depression, low self-esteem, stress, distress and lower marital and sexual satisfaction [18, 19]. When infertility treatment takes a long time or in the event of treatment failure, infertile patients are more likely to encounter hopelessness.

Loss of hope to have a child is significant because hope is one of the master psychological needs [20]. Hope generates self-confidence and internal positive feelings toward solving an existing problem. It has been defined as the anticipation of something good to come in the future. Snyder *et al.* [21] defined hope as "a reciprocally derived sense of successful agency (goal-directed determination) and pathways (planning of ways to meet goals)". What can be deduced is that agency is the perception that one can reach his/her goals, whereas pathways is known as the perception that one can find alternatives routes to reach these goals should the need arise [22]. It is anticipated that people with high levels of hope can consider about routes to arrive their goals, properly deal with illness and create more coping strategies [23]. So that fear, anxiety and fatigue occur minimal often in those individuals [24, 25]. So, psychologists should find hope and beliefs in patients in order to ease the therapy process through a life crisis, because this is considered an significant aspect of patient therapy [25].

Hope represents another psychological variable in theory relevant to women experiencing infertility and it has been presented as a widespread topic for men and women experiencing infertility in a plenty of studies [26-29]. More specifically, the hope for pregnancy and for becoming a parent prevails the infertility experience, often with a specific meaning for women who see maternity, a significant part of their identity and self-worth [30, 31].

During treatment for infertility, these women must equilibrium their hope for children against reality of the treatment experience; they should walk a fine line between hope and imagination [30]. Two years after failed IVF treatment, a sample of Swedish couples stated that they are still feeling hopeful about attaining pregnancy even after finishing treatment [27]. Hope for pregnancy serves as an origin of motivation to go on infertility treatments and low hope has been specified as a risk factor for infertility treatment ending which lead to infertile couple's psychological distress [30].

Distress is defined as an unpleasant situation that happen, when an individual is faced with expectations over their own characteristics and in which the individual perceives environmental stimuli as threats within the process of an interaction between themselves and the environment. Coping with stress indicate to an individual's strength to a case they consider being a stressor [32]. Gourounti *et al.* [33] argue that the rising level of anxiety and infertility distress during therapy has a passive effect on pregnancy rates.

Being resilient increases the individual abilities to face distress and cope effectively. Resilience is defined as the individual psychological capability to counter and adjust to difficult life proceedings [34]. Also, it was defined as a variety of ways, including the ability to bounce back or recover from stress, to adapt to stressful circumstances, not to become-ill despite major adversity and to function above the norm despite stress or adversity, As a "dynamic process encompassing positive adaptation within the context of significant adversity" [35]. Thus it can be seen as the affirmative parallel to vulnerability. Although several definitions of resilience exist resilient individuals can be generally described as believing in one's own self-efficacy, having problem-solving skills, having self-esteem and satisfactory interpersonal relationships [34, 36] Resiliency decreases due to infertility stress. Issacson [37] states that resiliency is merely adjustment and positive coping with problems and troubles. According to this view, resilience is not only ability or a personal characteristic, but these abilities and characteristics in interaction with stressors determine whether a person has the ability to cope with stressors or not. Researches also suggested that infertility reduces the personal strength in facing with problems of life and generally infertile people hardiness and resiliency against difficulties than normal individuals [38, 39]. Therefore this study was aimed to determine the relationship between resilience, distress and hope among infertile women undergoing IVF treatment.

Aim of the Study: To determine the relationship between resilience, distress and hope among infertile women undergoing IVF treatment

Research Hypotheses:

- Infertile women undergoing IVF treatment have a relationship between their hope, psychological distress and resilience.
- Infertile women undergoing IVF treatment have not a relationship between their hope, psychological distress and resilience.

MATERIALS AND METHODS

Research Design: A descriptive correlational research design was utilized to conduct the current study.

Settings: The study was carried out in Al- Madina women's hospital in Alexandria, Egypt. This hospital was particularly chosen because women undergoing in vitro fertilization turnover was satisfactory for the study and Elshatby Maternity University Hospital section for in vitro fertilization was closed at the time of data collection.

Subjects: The study included a convenience sample of 170 infertile women undergoing In Vitro Fertilization in the previously mentioned settings. The program of Epi info 7 was used to estimate the subject size, the minimal sample size was estimated to be 170 infertile women based on the following; the population size was 108 per 3 months, expected frequency 50%, acceptable error 5% and confidence co-efficient 95%.

The subjects of this study met the following inclusion criteria; women who undergoing in vitro fertilization and willing to participate in the study.

Tools: Four tools were used to collect research data. These tools were:

Tool I: A Structured Interview Schedule: Was developed and used by the researchers to collect the necessary data about the study subjects. It entailed three parts:

Part I:

Basic Socio-Demographic Data: It was designed to collect data about socio-demographic characteristics of the study subjects such as age, age at marriage, level of education, occupation, family income, crowding index, family type and residence.

Part II:

Reproductive History: It was comprised: gravidity, parity, number of abortion, number of dead children and number of living children.

Part III:

Infertility Information: It was comprised: type of infertility, duration of infertility, causes of infertility and number of previous in vitro fertilization.

Tool II: Infertility Distress Scale: The Infertility Distress Scale developed by Akyüz and colleagues [40] helps describe individuals' feelings and emotions regarding

infertility. The scale includes 21 items, 16 of which are direct and five are reverse. The negative statements were number 3, 10, 13, 14 and 21 ones. Responses to statements are rated on a four-point Likert type that ranges from 1 to 4 where (1) indicates "I don't feel at all", (2) indicates "I feel sometimes", (3) indicates "I feel at many times" and (4) indicates "I always feel". Higher scores received from the scale refer to a high level of infertility distress. Cronbach's alpha: 0.93. The total score is ranging from 21 to 84.

Scores ranging from 21-41 denotes low level of infertility distress, scores from 42-62 is considered moderate level of infertility distress and scores from 63-84 reflected a high level of infertility distress after consulting statistician.

Tool III: Connor-Davidson Resilience Scale (CD-RISC):

It created to address aspects of resilience and for use in clinical practice. Resilience is considered as the capacity to overcome adversity. The CD-RISC is a 25 item scale that has been studied in a variety of populations such as, members of different ethnic groups and cultures [41]. The scoring system was developed by the statistical department in the High Institute of Public Health based on related literature. Participants were asked to choose the most appropriate rating based on how he/she felt over the past month. Responses to statements are rated on a four-point Likert type that ranges from 0 to 4 where (0) indicates "not true at all" and (4) indicates "true nearly all of the time". Total score is obtained by summing up all items. The total score ranges from 0 to 100, with higher scores indicating greater resilience.

Respondents whose total scores range from 0-19 are considered as having very low level of resilience, scores ranging from 20-40 indicate low level of resilience, scores from 41-62 mean undetermined traits, scores from 63-83 denote high level of resilience and scores from 84-100 will reflect very high level of resilience. This instrument has been used extensively with different populations, including college students and adolescents [42].

Tool IV: State Hope Scale (SHS):

State Hope Scale (SHS) was developed by Snyder *et al.* [43]. It was used to measure an individual's hope. It also called goal directed scale. It is self-report scale consisted of 6 items divided into two sub scales namely; the pathways subscale (goal planning) and the agency subscale (goal motivation), four items for each. The four agency items measure the person's sense of successful determination in relation to general goals. The four pathways items refer to the person's cognitive

appraisal of the ability to generate means for reaching goals. It is rated on 6-point Likert scale ranging from 1 to 8, because of the length of the rating scale so the tool was modified statistically from 1 to 8 to be from 1 to 4 after consulting statistician (1= definitely false, 2= false, 3= true and 4= definitely true). The total score ranging from 4 to 32.

Scores ranging from 8-15 denoted low level of hope, scores from 16-23 considered moderate level of hope and scores from 24-32 reflected a high level of hope. The hope scale has demonstrated acceptable internal consistency using test-retest from the range of 0.74 – 0.78, from the total scale [44].

Method: Then the study was executed according to the following steps:

Approvals:

- An official letter from the Faculty of Nursing, University of Damhour was directed to the responsible authorities to obtain their permission to conduct the study after explaining its purpose.

Tools:

- Tool I was developed by the researchers after extensive review of recent and relevant literature.
- Tools II, III, IV were adopted, translated into Arabic language and tested for content validity by a jury of five experts in the field.

Tool's Reliability: Tools reliability was tested using Cronbach's Alpha test (internal consistency). Their results were 0.93 and 0.74 – 0.78 (tools II, III & IV) respectively which indicates a satisfactory and accepted reliability of the tool.

Consent: Each woman was individually interviewed and informed about the aim of the study in order to obtain her informed consent to participate in the study. Again, each of those who agreed to take part in the study was assured about confidentiality, privacy and right to withdraw at any time.

Pilot Study: A pilot study was carried out on 20 women (who were excluded from the main study sample).

The main purposes of the pilot study were to:

- Ascertain clarity, relevance and the applicability of the tools.

- Detect any problem peculiar to the statements as a sequence and clarity that might interfere with the process of data collection.
- Estimate the time needed to complete the sheet.

Results of the Pilot Study:

- The tools were clear, relevant and applicable and no changes were made.
- No problem that interfered with the process of data collection was detected.
- Each interview took approximately fifteen to twenty minutes.

Field of Work: Collection of data covered a period of 4 months (March 2018 and continued until the end of June 2018). Each infertile woman fulfilling the study criteria was interviewed individually once to collect the required information related to the four tools and each interview lasts between 30-45 minutes.

Ethical Considerations: For each recruited subject the following issues were considered: Securing the subject's informed consent, keeping the subject's privacy, assuring the subjects data confidentiality and the right to withdraw at any time.

Statistical Analysis: Statistical analysis was done by the researcher after collection of data by using statistical package for social science (SPSS) version 16 program. The collected data was categorized, coded, computerized, tabulated and analyzed. A descriptive and analytical statistics were used as frequency distribution tables, percentage, means and standard deviations. Chi-square-test, Fisher Exact test at 0.05 levels and Pearson correlation test at 0.01 levels were used to find out the statistical significant difference of the results.

RESULTS

Table 1 shows the number and percent distribution of infertile women according to their socio-demographic data. *Age* clarifies that almost two-thirds (65.88%) of infertile women were 20 to less than 35 years old, while slightly more than one-third (34.12%) of them were 35- 47 years old. *Age at marriage* was also 20 to less than 35 years among a sizeable proportion of infertile women (71.76%), while it was 14 to less than 20 years among 24.12% of them. However, *duration of marriage* was 5 to less than 10 years among 41.77% of infertile women, while it was 1 to less than 5 years among 28.82% of them.

Table 1: Number and percent distribution of infertile women according to their-socio-demographic data

Socio-demographic data	No (170)	%
Age (years):		
20-	112	65.88
35-47	58	34.12
Age at marriage:		
14-	41	24.12
20-	122	71.76
35-45	7	04.12
Duration of marriage:		
1-	49	28.82
5-	71	41.77
10-	28	16.47
15-27	22	12.94
Level of education:		
- Illiterate/read & write	21	12.35
- Basic	14	8.24
- Secondary or its equivalent	69	40.59
- University & more	66	38.82
Occupation:		
- Housewife	124	72.94
- Working	46	27.06
Type of work: (n=46)		
- Employee	23	50.00
- Professional	21	45.65
- Worker	2	04.35
Residence:		
- Urban	105	61.76
- Rural	65	38.24
Type of family:		
- Nuclear	150	88.24
- Extended	20	11.76
Crowding index:		
- Un-crowded (<2)	167	98.24
- Crowded (>2)	3	01.76
Family income/month:		
- More than enough	42	24.71
- Just enough	121	71.18
- Less than enough	7	04.11

In addition, *level of education* displays that 40.59% & 38.82% of infertile women had secondary or its equivalent and university or more respectively, while 12.35% & 8.24% of them were illiterate and had basic level respectively. Moreover, *occupation* manifests that about three-quarters (72.94%) of infertile women were housewives, while almost one-quarter (27.06%) of them were working. However, *type of work* manifests that one-half (50%) of working infertile women was employees, while less than one-half (45.65%) of them was professionals.

Table 2: Number and percent distribution of infertile women according to their reproductive history

Reproductive history	No (170)	%
Gravidity:		
0	99	58.23
1-3	65	38.24
4	6	03.53
Abortion:		
0	129	75.88
1-6	41	24.12
Parity:		
0	123	72.35
1-3	46	27.06
4	1	00.59
Living children:		
0	136	80.00
1-3	33	19.41
4	1	00.59
Dead children:		
0	165	97.06
1	5	02.94

Table 3: Number and percent distribution of infertile women according to their infertility data

Infertility data	No (170)	%
Type of infertility:		
- Primary	125	73.53
- Secondary	45	26.47
Duration of infertility:		
1-	64	37.65
5-	74	43.53
10-	21	12.35
15- 26	11	06.47
Causes of infertility:		
- Female factor	28	16.47
- Male factor	75	44.12
- Female & Male factor	28	16.47
- Unexplained	39	22.94
Previous IVF:		
- Done	84	49.41
- Not done	86	50.59
Number of previous IVF: (n=84)		
1-	76	90.48
4-6	8	09.52

The table also presents that *residence* was urban among slightly more than three-fifths (61.76%) of infertile women, while it was rural among almost two-fifths (38.24%) of them. *Type of family* also elucidates that the vast majority of infertile women (88.24%) had nuclear family, while a minority of them (11.76 %) had extended one. In addition, *crowding index* exhibits that almost all of infertile women (98.24%) live in un-crowded houses. Finally *Family income/month* expounds that a sizeable proportion of infertile women (71.18%) had just enough family income, while only (24.71%) of them had more than enough one.

Table (2) illustrates the reproductive history of infertile women. *Gravidity* makes clear that approximately three-fifths (58.23%) of infertile women were nulligravidae, while about two-fifths (38.24%) of them had 1-3 pregnancies. However, almost three-quarters (75.88%) of infertile women had no abortion, while about one-quarter (24.12%) of them had 1-6 abortions.

Parity also brings to light that about three-quarters (72.35%) of infertile women were nulliparae, while almost one-quarter (27.06%) of them had 1-3 deliveries. However, the majority of infertile women (80%) had no *living children*, while a minority of them (19.41 %) had 1-3 ones. Finally, almost all of infertile women (97.06%) had no dead children.

Table (3) demonstrates the infertility data of infertile women. *Primary infertility* was reported by approximately three-quarters (73.53%) of infertile women, while, secondary one was reported by almost one-quarter (26.47%) of them. *Duration of infertility* was 5 to less than 10 years among more than two -fifths (43.53%) of infertile women, while it was 1 to less than 5 years among less than two -fifths (37.65%) of them. In addition, *causes of infertility* clarifies that male factor was almost double folded an unexplained cause (44.12& 22.94%) respectively, while female and female/male factors represented 16.47%. Finally, *IFV* was done once for the vast majority of infertile women (90.48%), while it was done 4-6 times for a minority of them (9.52%).

Figure (1) sheds light upon the infertile women's total score of resilience level. High score was obtained by 42.35% of infertile women followed by undetermined traits (40%). Only (4.71%) of them obtained very high score.

Figure (2) elucidates the infertile women's total score of infertility distress. Moderate score was obtained by the vast majority of infertile women (94%), while high score was obtained by a minority of them (6%).

Figure (3) displays the infertile women's total score of hope. High score was obtained by more than one-half (52.35%) of infertile women, while moderate score was obtained by less than one half (43.53%) of them.

Table (4) displays the relationship between infertile women's socio-demographic data and their total scores of Resilience level, Infertility distress and Hope. Total score of Resilience level was statistically significant with age (P=0.010), duration of marriage (P=0.029), level of education (P=0.001), type of family (P=0.001) and family income/month (P=0.031).

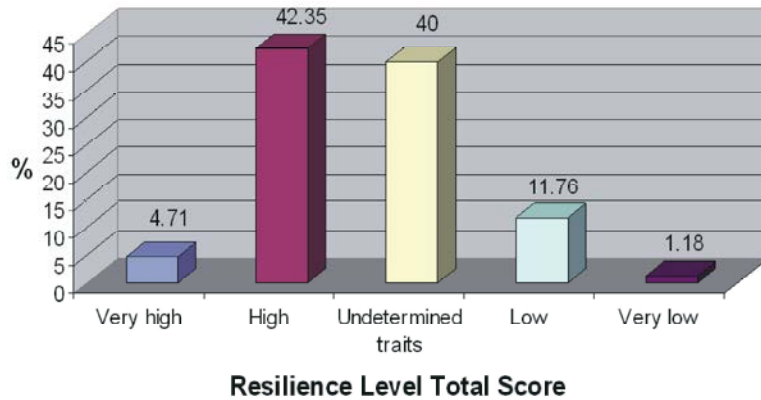


Fig. 1: Percent distribution of infertile women according to their total score of Resilience level

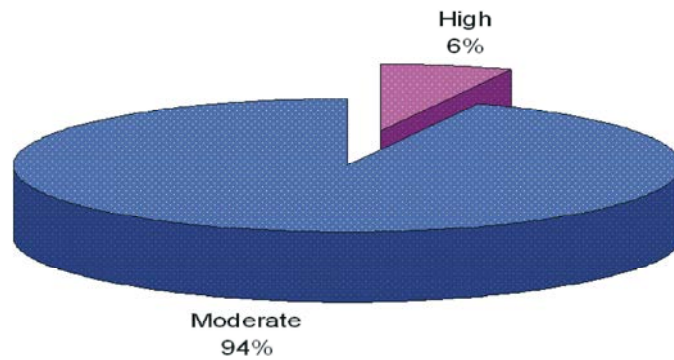


Fig. 2: Percent distribution of infertile women according to their total score of Infertility distress

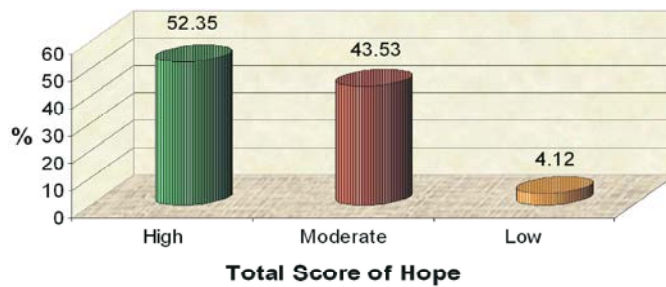


Fig. 3: Percent distribution of infertile women according to their total score of Hope

Total score of Infertility distress was also statistically significant with duration of marriage ($P=0.049$), level of education ($P=0.000$) and occupation ($P=0.037$). In addition, total scores of hope was statistically significant with level of education ($P=0.000$) and type of family ($P=0.031$).

Table (5) exhibits the relationship between infertile women's reproductive history and their total scores of resilience, infertility distress and hope. Total score of Resilience level was statistically significant with gravidity ($P=0.000$), while total scores of hope was statistically significant with abortion ($P=0.053$) and dead children ($P=0.035$).

Table (6) elucidates the relationship between infertile women's infertility data and their total scores of Resilience level, Infertility distress and Hope. Total scores of Infertility distress was statistically significant with duration of infertility ($P=0.001$) and previous IVF ($P=0.026$).

Table (7) presents the correlation between infertile women's total score of resilience, infertility distress and hope. It was found that total score of hope was positively correlated with total score of resilience ($r=0.527$), while it was negatively correlated with total score of infertility distress ($r=-0.303$).

Table 4: Relationship between infertile women's socio-demographic data and their total scores of Resilience level, Infertility distress and Hope

Socio-demographic data	Total score of Resilience level F / χ^2 (P)	Total score of Infertility distress F / χ^2 (P)	Total score of Hope F / χ^2 (P)
Age (years):			
20-35-47	13.21 (0.010)*	0.264 (0.871)	1.665(0.435)
Age at marriage:			
14-20-35-45	12.928 (0.114)	1.32 (0.516)	3.275(0.513)
Duration of marriage:			
1-5-10-15-27	22.82 (0.0293)*	7.85 (0.049)*	5.196(0.519)
Level of education:			
- Illiterate/read & write - Basic - Secondary or its equivalent - University & more	33.497 (0.001)*	39.805 (0.000)*	28.627(0.000)*
Occupation:			
- Housewife - Working	8.328 (0.080)	4.363 (0.037)*	5.699(0.058)
Type of work:			
- Employee - Professional - Worker	7.878 (0.445)	0.000 (1.000)	1.278(0.528)
Residence:			
- Urban - Rural	6.182 (0.186)	0.017 (0.89)	0.142 (0.931)
Type of family:			
- Nuclear - Extended	17.804 (0.001)*	2.725 (0.099)	6.931(0.031)*
Crowding index:			
- Not crowded (<2) - Crowded (>2)	1.14 (0.888)	0.211 (0.646)	0.318(0.853)
Family income/month:			
- More than enough - Just enough - Less than enough	16.899 (0.031)*	4.255 (0.119)	6.057(0.195)

χ^2 (P): Chi-Square Test & P for χ^2 Test
 F (P): Fisher Exact test & P for F Test
 *: Significant at P \leq 0.05

Table 5: Relationship between infertile women's reproductive history and their total scores of Resilience, Infertility distress and Hope

Reproductive history	Resilience level total score F / χ^2 (P)	Infertility distress total score F / χ^2 (P)	Hope total score F / χ^2 (P)
Gravidity:			
0 1-3 4	31.892 (0.000)*	0.603 (0.740)	1.296(0.862)
Abortion:			
0 1-6	2.25 (0.690)	2.936 (0.087)	5.87(0.053)*
Parity:			
0 1-3 4	8.241 (0.410)	0.557 (0.757)	2.288(0.683)
Dead children:			
0 1	1.723 (0.787)	0.356 (0.551)	6.683(0.035)*
Living children:			
0 1-3 4	6.48 (0.594)	0.083 (0.959)	1.104(0.894)

χ^2 (P): Chi-Square Test & P for χ^2 Test
 F (P): Fisher Exact test & P for F Test
 *: Significant at P \leq 0.05

Table 6: Relationship between infertile women's infertility data and their total scores of Resilience level, Infertility distress and Hope

Infertility data	Resilience level total score F / χ^2 (P)	Infertility distress total score F / χ^2 (P)	Hope total score F / χ^2 (P)
Type of infertility:			
- Primary	5.239 (0.264)	0.415(0.519)	1.078(0.583)
- Secondary			
Duration of infertility:			
1-	18.131 (0.112)	16.895(0.001)*	7.172 (0.305)
5-			
10-			
15- 26			
Causes of infertility:			
- Female factor	10.241 (0.595)	7.098(0.069)	12.31(0.055)
- Male factor			
- Female & Male factor			
- Unexplained			
Previous IVF:			
- Done	2.44 (0.655)	8.941(0.026)*	3.524(0.172)
- Not done			
Number of previous IVF:			
1-	2.44 (0.655)	0.029(0.864)	2.266(0.322)
4-6			

χ^2 (P): Chi-Square Test & P for χ^2 Test

F (P): Fisher Exact test & P for F Test

*: Significant at $P \leq 0.05$

Table 7: Correlation between total Resilience score, total infertility distress score and total hope score of studied infertile women

Score	Resilience score r(p)	Infertility distress score r(p)	Hope score r(p)
Resilience score	1	- 0.034 (0.657)	0.527 (0.000)*
Infertility distress score	- 0.034 (0.657)	1	- 0.303 (0.000)*
Hope score	0.527 (0.000)*	- 0.303 (0.000)*	1

r (P) Pearson correlation test & P for r test

*: Significant at P 0.01

DISCUSSION

Infertility is undeniably a major life crisis for many couples. The distress of infertility and its medical treatment affects different aspects of the life of each partner [45]. It can completely upgrade the lives of affected individuals; one's self-esteem, dream for the future and relationship with others, may all get affected in addition to the traumatic feeling of the couples for being labeled as infertile [46]. Also, it has physical, emotional and social burden in addition to its effect on the couples' quality of life [47].

Infertile couples restore to various types of treatments such as IVF to be fertile. It helps them to cope with their problems and increases their resilience. It may let them to have a relatively high psychological stress tolerance. One of the mature defense mechanisms that

help the infertile couples to be resilient is the hope. Having hope helps infertile couples to accept their situation and face the stigma of being infertile [48].

The present study revealed that hope played a great role with infertile women as it increased the infertile women resilience and decreased their stress. It is clear in the study results that there is significant relationship between infertile women hope total score and their resilience total score. This result is consistent with a study done by Shadbad and Vafa [49] who reported that a significant relationship between infertile women's hope and their psychological well-being. Another study done in Iran-had reported that hope enhances coping abilities of the infertile women to adapt with their problems [50].

Infertility is usually associated with increased level of distress. Adapting well and using personal resources help people to be resilient, tolerate stress and increase their

positive emotion [51]. A study showed that hope therapy decreased the score of stress of infertile women as hope helps them to adapt with their situation and also increasing their self-confidence [50]. In the same direction; the results of the present study indicating a negative relationship between infertile women resilience and their distress level without significance of this relationship as nearly half of infertile women 42.35% had a high level of resilience and the majority 94% of them with moderate level of distress. These results are supported by a study done by Herrmann et al. in Germany [52] as they reported that high resilience of infertile women was correlated to low level of their psychological distress. This was explained by the studied women as they verbalizing that sharing stress with their spouses and their trial to support each other was the main factor that help them to adapt with their situation.

In the present study a significant negative relationship between infertile women's total hope score and their total score level of distress was evident. This already is consistent with a study done by Samani *et al.* [53] in Iran who reported that hope is important in reducing psychological symptoms and psychological adjustment in those exposed to infertility and infertile couples who have high levels of hope had a low level of psychological tensions.

Presence of hope and spiritual faith act as energizer to do and cope with infertility stress and increasing the infertile women resilience [54]. In the current study although the infertile women were hoping that they will be able to be fertile, yet they were facing other challenges as uncertainty of the IVF outcome and surrounded peoples' negative comments that put them under stress all the time at home, work or even with relatives. Being an infertile Egyptian woman is definitely disadvantageous compared to the males despite that they are not usually the responsible for infertility alone. This is confirmed in the present study where there is a significant relationship between studied women distress total score and their previous IVF ($p = 0.026$) and only 16.47% of the women were the responsible for infertility compared to 44.12% is related to husband's problem. This is in the same line of a study done in Yemen that reported that male factors of infertility are more than female factors [55] while another study in Poland reported that the inability to conceive occurs equally in men and women [56]. Infertile women usually strive for being pregnant for achievement of their feminine identity as well as achieving their husband's satisfaction; so, having previous pregnancy even ended with abortion or dead child give the infertile women the

sense of hope and increase their resilience. In the present study there is a statistically significant relationship between infertile women hope and their experience with abortion or history of dead children, also, a significant relationship between their resilience level and being pregnant. This is may be explained as that presence of previous experiences of pregnancy increase those woman level of hope that they will have a completed pregnancy as the infertile woman in the present study expressed that they may have child because they were pregnant but were abortive and this is better than not pregnant at all.

Being infertile for long period acts as a main factor in increasing the infertile women distress [57]. In the present study, there is a statistically significant relationship between infertile women distress total score and their duration of infertility form 5 to less than 10 years. This is consistent with a study done by Wiwoko B *et al.* [57] in Indonesia which revealed a significant relationship between level of stress of infertile women and their duration of infertility.

In fertility is a sensitive issue for married couples. Childlessness is usually a tragedy and can cause marital disturbance as well as personal unhappiness and ill health. So, infertile women usually in need for increasing their resilience to help them to overcome the psychological pain and stigma of infertility which can be achieved by using hope as a mature defense and a protective factor against stress.

CONCLUSIONS

Based on the findings of this study, it could be concluded that more than half of infertile women undergoing IVF obtained high total score of hope and nearly half of them have high total score of resilience level, while the vast majority of infertile women obtained moderate total score of infertility distress. In addition, it was found that the total score of hope was positively correlated with total score of resilience, while it was negatively correlated with total score of infertility distress. Also, having a dead child or being abortive is main factor that affecting infertile women hope level.

Recommendations: In the light of the results of this study, the following recommendations are suggested:

- Instillation of hope Psychological counseling sessions should be carried out for infertile women during treatment cycles.

- Nurses should assess infertile women level of resilience and help them to be resilient through educating both couples how to adapt and cope with infertility problems.
- Training educational programs should be carried out for nurses to be aware with essential information regarding infertility coping strategies and counseling infertile women.

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