Reproductive Health

RESEARCH

Open Access

Preventing violence and enhancing mental health among clients of an invitro fertilization clinic in Jordan: results of a pre/post pilot test of the use of cognitive behavioral therapy

Cari Jo Clark[1*], Zaid Al-Hamdan[2], Hala Bawadi[3], Hussein Alsalem[4], Jehan Hamadneh[5], Adnan Abu Al-Haija[6], Alexandria Ree Hadd[1], Rachael A. Spencer[7], Irina Bergenfeld[1] and Rachel Hall-Clifford[8]

Abstract

Introduction Infertility increases women's risk of intimate partner violence (IPV). Cognitive behavioral therapy (CBT) is commonly used to treat mental health problems among fertility treatment seeking patients. CBT has not been tested for its potential to reduce IPV in this population. We pilot test the use of CBT to prevent IPV and improve patients' mental health in a fertility clinic in Jordan.

Methods Of 38 eligible fertility-treatment seeking couples, 16 consented and underwent up to 11 CBT sessions (average = 9) over 3 months. Interviews at baseline and 16 weeks post intervention (endline) assessed IPV, quality of life, social support, coping, and fear of spouse. Wilcoxon signed-rank and McNemar's tests were used to assess change in outcomes.

Results At baseline, women's rates of IPV, depression, and anxiety were 75%, 87.5%, and 75% respectively, whereas men's rates of depression and anxiety were each 80%. Average baseline post-traumatic stress disorder (PTSD) symptoms for men and women were 3.3 and 2.7 respectively out of 5. IPV decreased 25% after treatment, and women reported less spousal fear. For both men and women, depression, anxiety, and PTSD symptoms decreased and social support and fertility quality of life improved.

Conclusion Psychosocial support should be standard of care for the treatment of infertility given the burden of mental health problems and IPV and the utility of CBT in this patient population. Co-design with couples is needed to identify strategies to bolster participation along with population-based interventions to combat the stigma of infertility and mental health service use and enhance women's status.

Keywords Intimate partner violence, Cognitive behavioral therapy, Mental health, Prevention, Jordan

*Correspondence:
Cari Jo Clark
cari.j.clark@emory.edu
Full list of author information is available at the end of the article

Introduction

Intimate partner violence (IPV), defined by the World Health Organization as behavior within an intimate relationship that causes physical, sexual or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse and controlling behaviors" [1] is the most frequently experienced form of gender-based violence [2]. It has been shown to be elevated in women experiencing infertility [3]. Both rates of infertility and IPV are high in the Middle East, the former attributed in part to a preference for consanguineous marriages [4] and the latter to elevated rates of common risk factors for IPV, especially women's lower social status to men given the predominance of patriarchal formal and informal systems. While decreasing over time, 1 in 4 Jordanian women report exposure to IPV [5], which for many may also coincide with exposure to in-law abuse [6]. While precise estimates of infertility are lacking, among married reproductive age individuals 16% of women and 9% of men self-reported infertility [5].

The intersection of infertility and IPV are not fully elucidated, but several correlates of infertility are well-established risk factors for IPV including marital discord and dissatisfaction [7–11], poor mental and psychosocial health [7, 8, 12–15], isolation [16] and challenges to gender norms associated with infertility [4, 13, 17–22].

Infertility and undergoing fertility services are mentally, physically, and financially stressful to both men and women [7, 11, 14, 23]. This stress is compounded by personal and social pressure to have children in a pronatalist, patriarchal society [4, 24]. In Jordan, both men and women gain status and fulfill expected gender roles through parenthood [13, 19, 20]. The inability to have children challenges these personal and social expectations, exposing men, but especially women to constant reminders and inquiries about their lack of children [24], leading some to isolate themselves to avoid these repeated intrusions, or to be isolated by others out of superstitious fear of the evil eye [16]. Overall, the impact of infertility has serious social, emotional, and financial impacts on the couple, including straining marital relationships and potentially increasing men's risk of perpetrating IPV.

Cognitive behavioral therapy and life-skills training have the potential to reduce violence by improving couple psychological well-being and functioning and when done in a group format, can reduce isolation, shame and stigma [25], and provide new reference groups for gender norms change. CBT is geared toward improving problem solving around a focal issue through cognitive restructuring and behavioral activation [26] and is an evidence-based strategy for a number of IPV relevant mental health conditions, including depression, anxiety, post-traumatic stress disorder (PTSD), and distress [27]. It is among the most frequently used psychosocial therapy for fertility service-seeking patients [11, 28] and has been shown to improve infertile patients mental health and chances of conception [29].

Within the violence prevention literature, CBT has been used most frequently among male perpetrators, with small, often court mandated samples with mixed success [30]. A 2020 Cochrane Review identified only 2 psychological treatment-focused interventions among women for synthesis, with a combined sample size of only 547. An average null finding was reported, but the authors concluded that there is too little research and of variable design and quality to answer whether psychological-treatment focused interventions reduce IPV among women [31] calling for more plentiful, harmonized, and rigorous research. A recently published trial of a couples-focused cognitive behavioral intervention in Zambia showed significant reduction in women's experience of IPV and men's use of hazardous alcohol consumption [32]. It was deemed so successful that it had to be discontinued so that the intervention could be provided to the control condition couples for ethical reasons. The inclusion of both partners in the intervention and the reliance on an evidenced-based psychological treatment strategy are keys to its success. Additional analysis of mechanisms of action beyond alcohol reduction included an interplay of conflict mitigation, anger management, and improvements in trust, understanding, and communication [33]. Involving men in IPV prevention is not a new phenomenon and recent randomized trials of IPV prevention interventions highlight the importance of couples' involvement in effective violence prevention [34–36]. However, the focus of infertility and IPV research has concentrated on women's experience of IPV and recommendations of how to respond to IPV survivors, namely providing psychosocial support and referrals. While this is an essential and ethical healthcare response, a focus on violence prevention has been lacking.

Our pilot study aims to fill this gap by adapting an existing evidenced-based intervention currently available to women in Jordan, group CBT to include a couple's focus by adding a parallel group for women's spouses and subsequently applying this strategy among fertility treatment seeking couples to improve psychosocial health and couple functioning with the ultimate aim of reducing the occurrence of IPV.

Specifically, we test the following research questions:

3.1 Do women report a decrease in past year experience of IPV?

3.2 Do women and men report improvements in mental health symptoms (depression, PTSD) and fertility quality of life?

3.3 Do women report reduced fear of their spouse and do men and women report reduced marital discord and improved coping and social support?

3.4 How similar or different are those who participated in group therapy from the wider sample participating at baseline?

In addition to these research questions, the study team also sought feedback from the non-participants to understand reasons for lack of participation, from participants to understand their experience with the intervention, from therapists who administered the intervention to gain insight into perceived client benefit and challenges to implementation, and from a participating clinician to understand the implication of study findings on clinical practice to inform future studies.

Methods

Setting

The site for this study is the In Vitro Fertilization (IVF) Center at the King Abdullah University Hospital within the Jordan University of Science and Technology in Irbid which is one of approximately 25 IVF clinics in the country. Most IVF clinics in Jordan are private. The study clinic is public; however, most services are not covered by insurance. Some insurance plans cover a percentage of the diagnostic testing, but not the cost of the visits, medications, or the IVF procedures themselves. Individuals can approach the clinic for services directly or through a referral. Approximately 1500 patients use the IVF center yearly.

Sample

Figure 1 depicts how the final analytic sample was developed from eligible couples. Couples residing in Jordan who had been married at least 2 years and who were seeking services for primary infertility (having unprotected sex for at least 1 year without conception) or secondary infertility (having unprotected sex for at least 1 year subsequent to a birth or abortion) at the study clinic were eligible to participate. Names of eligible patients were provided to the research team by a physician practicing in the clinic. The research team then contacted patients and invited them to participate in the study to avoid coercion or expectations that participation would affect the treatment they received at the clinic. Psychologists administered the baseline survey individually to each member of the couples. This was deemed safer for participants, as the psychologists had professional training in dealing with distress, should it occur. Potentially eligible individuals subsequently underwent an intake evaluation by a psychologist to assess mental health needs. Thirty-eight couples were deemed in need of mental health support and therefore eligible for the intervention. These problems that the individuals presented with differed and ranged from abuse to distress. Individuals in particularly acute need were offered individual sessions prior to the start of the groups (described below). Eligible couples were recruited into group therapy by the research team. Eight couples were not able to be subsequently contacted after 3 attempts (phone disconnected, no answer), and six couples refused to participate. Of the 24 couples who agreed to participate in the group sessions, 16 attended more than 1 session. The analytic sample includes baseline and endline data on all wives and 15 husbands as 1 husband was unavailable for the endline survey.

Intervention

Eleven gender-segregated CBT sessions were delivered per group (2 groups per gender). All four groups convened simultaneously on the same day. The sessions were held once a week with each session lasting between one and a half to two hours. Session focus areas included topics in line with the hypothesized theory of change (Fig. 2): (1) group norms and goal-setting; (2) understanding psychosocial stress; (3) identification of stressors and impacts on day-to-day life; (4) the impact of self-perception of day-to-day life; (5) expression and safe management of feelings (6) overcoming obstacles to communication; (7) effective communication strategies; (8) questioning assumptions and self-perceptions about problems; (9) problem-solving and strategies for restructuring relationships; (10) development of new approaches to life by removing unfounded anxieties; and (11) highlights of prior sessions and reminders for application in day-to-day life. Prior to the group therapy, 6 participants were deemed in need of individual therapy (range of 4 to 6 sessions) before entering the group sessions. After the cessation of the intervention, 8 participants continued individual therapy for 4 additional sessions. All sessions were led by psychologists experienced in CBT and were gender-matched to the participants.

Data

Face-to-face interviews were conducted with patients at the clinic site in data collection sessions prior to and 16 weeks after the cessation of group therapy (baseline and endline assessments, respectively). Survey content at each timepoint included socio-demographics, reproductive history, mental health treatment history, and outcomes in alignment with the study's theory of change (Fig. 2), including: symptoms of depression, anxiety, and PTSD; fertility-related quality of life and norms; risk factors for and experience of IPV and in-law abuse (women only); and social support and coping. We also measured program participation (at endline) and reactions to survey participation (at both timepoints) to

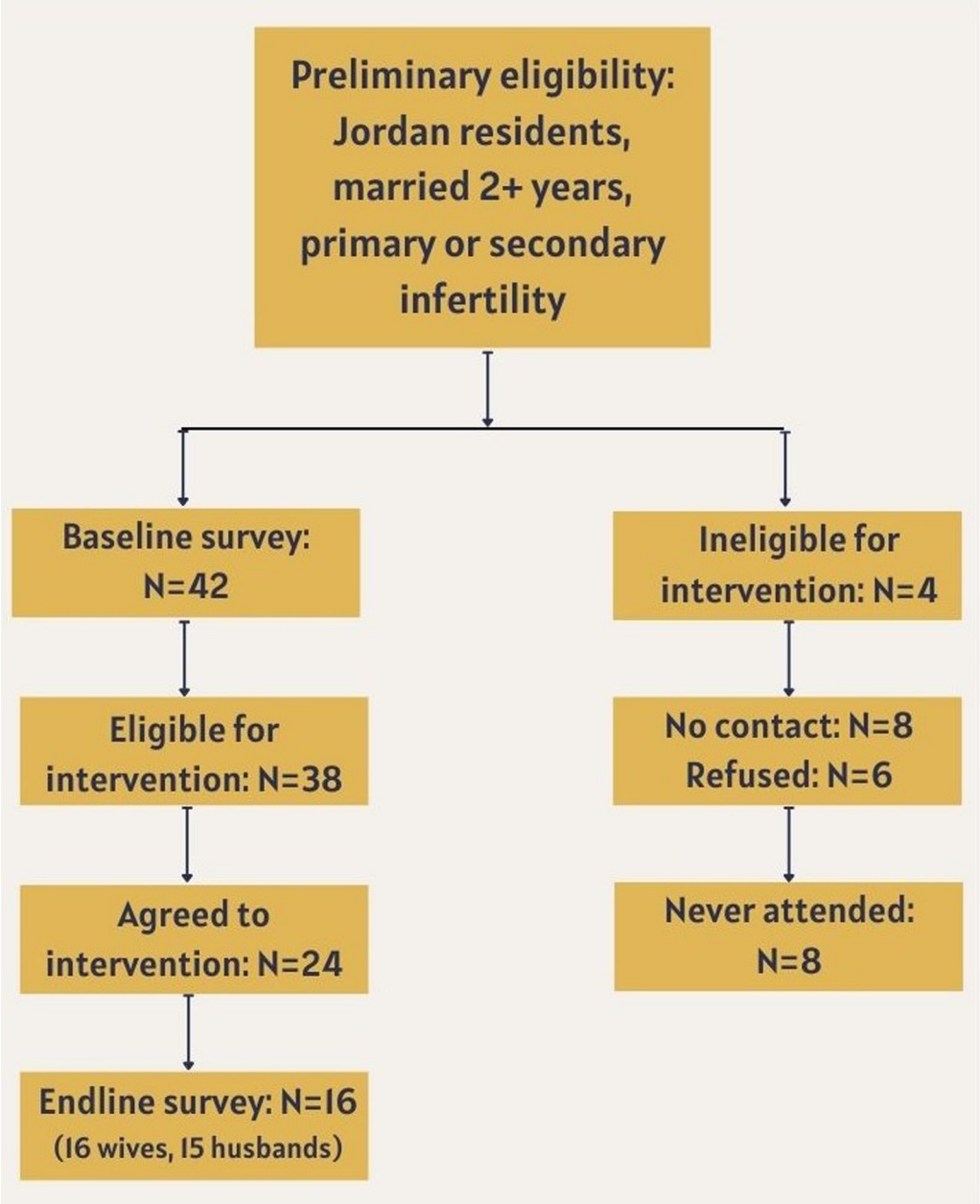

Fig. 1 Participant flow diagram

assess self-reported exposure to the program along with adherence to study ethics. Interviews were conducted in Arabic, by a therapist of the same gender and in a private space.

Primary outcomes

Intimate partner violence ever and in the past 12 months was assessed with an augmented version of the World Health Organization's Multi-Country Study on Women's Health and Domestic Violence [37] which had been used in prior research in Jordan [38]. Participants reported on their experience of 8 psychological items, 6 physical items and 2 sexual items using a 4-point Likert scale (Never/Once/A few times/Many times). Separate dichotomous variables were created for each subtype with endorsement of any experience within that subset as indicative of abuse. The Cronbach's alpha for the scale was good (0.92).

Depression and anxiety were assessed with the Hopkins Symptoms Checklist-25 (15 items assessing depression,

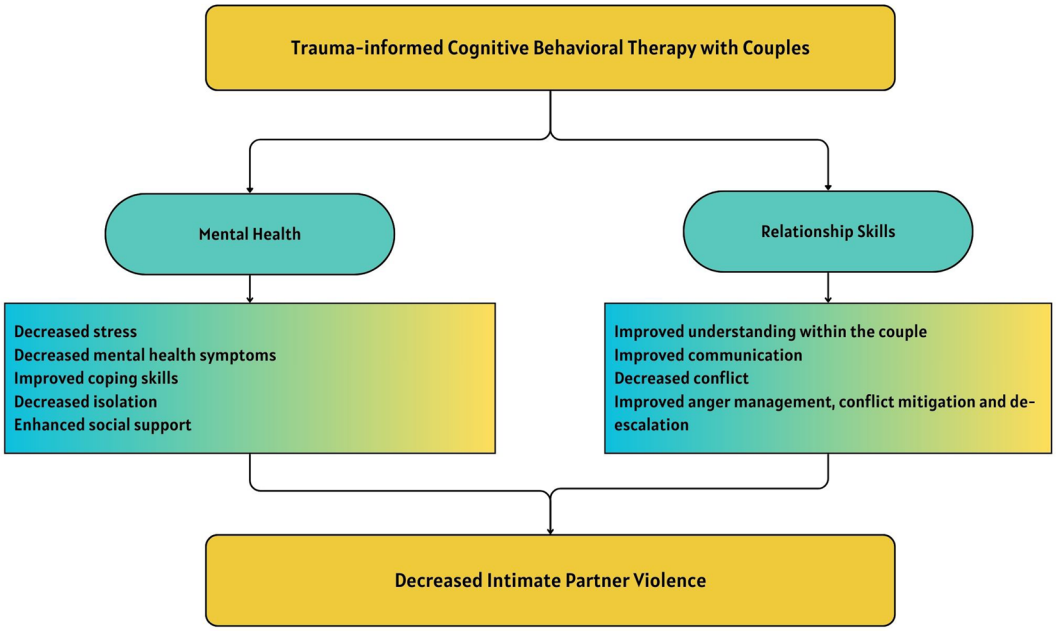

Fig. 2 Intervention theory of change

10 items assessing anxiety) which has been translated and validated in Lebanon [39, 40] and used widely in Jordan e.g. [41–43]. Items measured the frequency with which the respondent was bothered by each symptom in the past week on a 4-point Likert scale (not at all/a little/quite a bit/extremely) and then averaged together, with higher scores indicating more depression or anxiety symptoms. The scale had a good Cronbach's alpha for depression (0.86) and anxiety (0.85). We additionally assessed depression and anxiety dichotomously using the established cutoff of $M = 1.75$ [41, 43].

PTSD was measured by study team-generated items from a scale that was developed and validated (although unpublished) by the therapeutic team in Jordan based on the DSM-IV. Respondents were asked to report whether they experienced 22 symptoms using a 5-point Likert scale (never/rarely/sometimes/often/always), where higher scores represent more severe symptoms. The Cronbach's alpha for the measure was strong (0.95).

Secondary outcomes

Quality of life related to fertility was assessed with the 24 core items of the Fertility Quality of Life Scale [44, 45]. The scale includes two additional context questions assessing self-rated health and degree of satisfaction with the respondent's quality of life. Sub-scales, each with 6 items assess negative emotions (emotional: 6 items), physical symptoms or negative cognitive or behavioral disruptions (mind–body: 6 items), and the impact of infertility on the marital/partner relationship (relational: 6 items) and social interactions (social: 6 items). Each item is scored on a 5-point Likert scale with response scales differing by item; for example, some items used a "very poor" to "very good" scale whereas others used a "not at all" to "completely" scale. Items with a negative valence were reverse coded and averaged together to create the four subscales and total scores, such that higher scores indicated higher quality of life. The Cronbach's alpha was strong for the total scale (0.92) and was acceptable or good for the emotional (0.90), mind–body (0.84), relational (0.80), and social (0.75) subscales.

Social support was measured with the Arabic version of the Multidimensional Scale of Social Support (Arabic MSPSS) [46]. Respondents were asked their level of agreement on a 7-point Likert scale (very strongly disagree/strongly disagree/mildly disagree/neutral/mildly agree/strongly agree/very strongly agree) to 12 items assessing agreement about support received from family, friends and significant others, such that higher scores indicated more support. Cronbach's alpha for the scale was very good (0.97).

Coping was measured with the Brief Resilient Coping Scale [47]. Participants were asked how well each of the 4 items described their situation on a 5-point Likert scale

(Does not describe me at all/Does not describe me/Neutral/Describes me/Describes me very well). Higher scores indicated greater coping. The Cronbach's alpha of the scale was good (0.85).

Fear of spouse was measured with a study-generated single item asking respondents, "How often are you afraid of your spouse?" Response options were on a 5-point Likert scale (never, rarely, sometimes, often, always).

Other variables of interest

Socio-demographics assessed included age, date of birth, educational level, participation in paid employment, financial distress, year of marriage, whether the marriage was their first marriage, consanguinity, polygamy, and residence status categorized as nuclear or extended family residence.

The reproductive history module examined history of pregnancy (yes/no), count of total prior pregnancies, whether the respondent is currently trying to become pregnant (yes/no), duration in months of trying to become pregnant, current pregnancy status, number of children alive, type of infertility (primary/secondary), duration of infertility (years), duration of infertility treatment seeking (years), treatments received (IVF, ovulation induction, surgery, intrauterine insemination), and outcome of prior treatment (failed to produce pregnancy, pregnancy that ended in miscarriage, currently pregnant, had a baby).

History of mental health treatment was assessed with 2 items measuring discussions with persons other than family or friends about emotional or psychological issues (yes/no) ever and in the past 12 months (yes/no). If yes, the respondent was asked to identify the person from a list of 9 options (psychologist/psychiatrist/case manager, case workers or outreach worker/social worker/nurse/physician/religious leader/support group/other).

Norms about infertility were assessed with 12 items (6 individual statements about men and women) developed by the study team based on formative research. Items assessed the extent to which the participant believed that people in their community would agree with gendered statements about acceptable behaviors or beliefs regarding infertility (e.g., "It is acceptable for a [woman/man] to marry someone else if [her husband/his wife] does not give [her/him] children" and "When a couple cannot have children, blame is usually placed on the [woman/man].). Items were assessed on a 3-point Likert scale (most [people in my community] would agree/half would agree and half would disagree/most would disagree) and averaged across the six statements separately for woman- and man-referencing items, with higher scores indicating more accepting perceived infertility norms. Cronbach's alpha for this measure was adequate (0.76).

Abuse from other family members was assessed with 3-items derived from the IPV scale and used in prior research for this purpose [6]. Items assessed the occurrence (yes/no) of emotional violence, physical violence, and encouragement of the respondent's spouse to use violence against her. For each affirmative response, the respondent was asked to indicate which family member(s) perpetrated the act with 13 options across marital and natal family members.

Survey participation

Reactions to survey participation were assessed with 6 items from the Respondents Reactions to Participation Questionnaire to assess patient comfort and perceived benefit during the survey-administration process [48]. Items assessed voluntary participation, ability to stop at any time, experience of intense emotions, meaningfulness of the study to themselves and to others using a yes/no format.

Intervention participation and feedback

Degree of participation (less than half, about half, most of the session, all of the sessions) was self-reported by the participant and spouse along with reasons for less than full participation (not interested, could not miss work, too busy, financial burden, social commitment, spouse refused, and other). The number of sessions that the respondent attended was also reported by the therapist. Open-ended questions were included on the participant survey to obtain feedback on the most helpful intervention content and suggestions for improvement. Reasons provided for participation refusal was systematically documented and feedback was requested from the therapists who delivered the intervention, which was included in a post-intervention report. Finally, the results were shared with a participating clinician for feedback on their relevance to practice in Jordan.

Analysis

Descriptive statistics by gender and time period were calculated. We also examined missing data in the analytic sample due to item skipping and found no systematic skipping patterns (e.g., a particular item that several participants skipped, a particular participant that skipped several items). The highest rate of item-level missing data was 6% (two participants) on one PTSD scale item ("I avoid people associated with the traumatic event"). Whereas several scales (e.g., the Fertility Quality of Life Scale, MPSS) are typically reported with sum/total score scores, we report participants' average scores for all scales and subscales to avoid downward score bias in the total scores for the few participants missing data on individual items.

To address research question 3.4, independent-samples *t* tests and Fisher's exact tests were conducted to determine similarities at baseline between the full sample (those who provided data at baseline but may or may not have provided data at endline) and analytic sample (those who provided data at endline as well as baseline). Tests were stratified by gender and reported with descriptive statistics in Table 1. To address research questions 3.1–3.3, changes between baseline and endline for primary and secondary outcomes were examined using Wilcoxon signed-rank tests and McNemar's tests and are reported with descriptive statistics in Table 2. The Wilcoxon signed-rank test is a nonparametric alternative to a paired-samples *t* test appropriate for small samples, and McNemar's test is a similar nonparametric test appropriate for paired, dichotomous outcomes. Textual responses to the open-ended survey questions, feedback from the therapists administering the intervention and from the clinician providing the fertility services was summarized thematically to provide insight to improve future administration of the intervention.

Ethics

The study was approved by the Institutional Review Boards at Jordan University of Science and Technology (6/141/2021, 6/1/2021) and Emory University (0000321, 9/3/2021). All participants provided written informed consent and the study followed international standards on research involving violence against women, including offering immediate professional assistance for violence or distress [49]. In addition, a special hotline was established by the institute delivering the CBT to support participants and set up a WhatsApp group for ongoing group support which continues to function to this day.

Results

Table 1 reported the baseline demographic and outcome variables for the full and analytic samples.

Similarity between full and analytic samples

The follow-up rate was below 50% (42% for women, 39% for men), with most respondents reporting a lack of time to participate. Despite relatively high attrition, there were many similarities between the full sample ($N=76$) and the analytic sample ($N=31$) at baseline. There were no significant differences in age, education, employment status, marriage duration, infertility or infertility characteristics, or reactions to participation between the full and analytic sample at baseline. Participants attrited at endline were more likely to have missing data on sensitive outcomes (such mental health or IPV items) at baseline. Additionally, men in the analytic sample tended to have worse scores for fertility quality of life, depression, and social support and better PTSD scores at baseline than men in the full sample. Conversely, women in the analytic sample only significantly differed from women in the full sample at baseline in social support; women in the analytic sample had significantly worse social support at baseline.

Intervention participation

Table 2 reports endline outcomes for the analytic sample, including intervention participation and the change in primary and secondary outcomes from baseline to endline. On average, both men and women attended nine of eleven sessions (range 6–10) according to the therapist attendance records. Most participants self-reported attending most of the sessions (60% for both men and women). Whereas men reported the reason they missed sessions was because they could not miss work (9; 60%), women reporting missing sessions because they were too busy (4; 25%), they had a social commitment (2; 12.5%), or other reasons (3; 18.8%). No participants reported lack of interest, financial burden, or husband refusal as a reason for missing sessions.

Change over time

Fertility quality of life

Both men and women in the analytic sample showed significant improvement in fertility quality of life from baseline to endline. This improvement was observed for the total scale and all four subscales. Improvements were larger for men (1.3–1.8 points on the 5-point scale) than for women (0.8–1.3 points); this gender difference in fertility quality of life improvement is driven by men having slightly lower fertility quality of life than women at baseline and having slightly higher fertility quality of life than women at endline.

Mental health

Participants reported significantly lower depression and anxiety scores at endline relative to baseline, with both men and women reporting an average reduction of one point on the 4-point scales. PTSD symptoms significantly decreased at endline for both men and women, with women reporting larger decreases in PTSD. This gender difference is driven by women reporting higher PTSD scores at baseline than men; at endline, men and women reported similar levels of PTSD. Conversely, both men and women reported significantly higher levels of social support at endline compared to baseline, with men reporting substantially more improvement in social support than women. This gender difference reflects men's lower social support scores at baseline compared to women; at endline, women still reported more social support than men, but the gender difference at endline

Table 1 Baseline descriptive statistics for the full and analytic samples

Outcome (range)	Full Sample (*N* = 76)		Analytic Sample (*N* = 31)	
	Wife (*N* = 38) *M* (*SD*) *n* (%)	Husband (*N* = 38) *M* (*SD*) *n* (%)	Wife (*N* = 16) *M* (*SD*) *n* (%)	Husband (*N* = 15) *M* (*SD*) *n* (%)
Sociodemographics				
Age (23–53)	31.9 (5.6)	37.0 (5.6)	31.6 (6.2)	36.7 (5.4)
Education				
Primary	2 (5.3%)	3 (7.9%)	1 (6.3%)	2 (13.3%)
Secondary	13 (34.2%)	17 (44.7%)	8 (50.0%)	6 (40.0%)
Tertiary	23 (60.5%)	18 (47.4%)	7 (43.8%)	7 (46.7%)
Paid employment	12 (31.6%)	36 (94.7%)	5 (31.3%)	14 (93.3%)
Financial stress	25 (65.8%)	25 (65.8%)	9 (56.3%)	12 (80.0%)
Years married (2–19)	7.9 (4.5)		8.5 (4.7)	
First marriage	70 (92.1%)		28 (90.3%)	
Polygamous marriage	2 (2.6%)		0 (0.0%)	
Consanguineous marriage	26 (34.2%)		12 (38.7%)	
Living situation				
Nuclear	58 (76.3%)		21 (67.7%)	
Other	18 (23.7%)		10 (32.3%)	
Reproductive history				
Ever been pregnant*	23 (62.2%)		9 (56.3%)	
Trying for pregnancy*	36 (97.3%)		15 (93.8%)	
Trying for over a year*	25 (67.6%)		11 (68.8%)	
Currently pregnant ‡	2 (8.7%)		1 (11.1%)	
# of Children alive (0–4)	1.0 (1.1)		0.9 (1.0)	
Infertility type*				
Primary	28 (75.7%)		13 (81.3%)	
Secondary	9 (24.3%)		3 (18.8%)	
Infertility duration* (1–22 years)	7.3 (5.6)		8.4 (5.6)	
Tx duration (0–18 years)	6.1 (4.8)		6.4 (5.2)	
Infertility Tx received*				
IVF	23 (62.2%)		10 (62.5%)	
Ovulation induction	10 (27.0%)		2 (12.5%)	
Surgery	0 (0.0%)		0 (0.0%)	
IUIb	16 (43.2%)		7 (43.8%)	
Prior Tx resulted in birth				
IVF	9 (24.3%)		3 (18.8%)	
Ovulation induction	0 (0.0%)		0 (0.0%)	
IUI	1 (2.7%)		1 (6.3%)	
Infertility norms				
Male	2.5 (0.5)	2.2 (0.6)	2.5 (0.6)	2.0 (0.7)
Female	1.5 (0.5)	1.4 (0.5)	1.5 (0.5)	1.3 (0.4)
Fertility quality of life				
Total (1–5)	2.8 (0.6)	**2.9 (0.9)**	2.6 (0.6)	**2.4 (0.9)**
Mind–body (1–5)	2.5 (0.9)	**2.8 (1.1)**	2.4 (0.9)	**2.2 (1.0)**
Emotional (1–5)	2.5 (0.7)	**2.8 (0.9)**	2.3 (0.6)	**2.3 (0.8)**
Relational (1–5)	3.5 (0.8)	3.4 (0.7)	3.4 (0.9)	3.2 (0.5)
Social (1–5)	3.0 (0.8)	**3.1 (0.8)**	3.0 (1.0)	**2.6 (0.6)**
Mental health				
Sought support				
Ever	9 (23.7%)	9 (23.7%)	4 (25.0%)	3 (20.0%)

Table 1 (continued)

Outcome (range)	Full Sample (*N* = 76)		Analytic Sample (*N* = 31)	
	Wife (*N* = 38) *M* (*SD*) *n* (%)	Husband (*N* = 38) *M* (*SD*) *n* (%)	Wife (*N* = 16) *M* (*SD*) *n* (%)	Husband (*N* = 15) *M* (*SD*) *n* (%)
In Past Year	8 (21.1%)	9 (23.7%)	4 (25.0%)	2 (13.3%)
Depression (1–4)	2.6 (0.6)	**2.1 (0.6)**	2.5 (0.6)	**2.5 (0.7)**
At or above level	36 (94.7%)	27 (71.1%)	14 (87.5%)	12 (80.0%)
Anxiety (1–4)	2.4 (0.8)	2.1 (0.6)	2.4 (0.7)	2.3 (0.7)
At or above level	30 (79.0%)	27 (71.1%)	12 (75.0%)	12 (80.0%)
PTSD (1–5)	3.3 (0.7)	**3.3 (1.3)**	3.3 (0.8)	**2.7 (1.3)**
Social support (1–7)	**5.1 (1.6)**	**4.5 (2.0)**	**5.8 (1.3)**	**3.5 (2.1)**
Coping (1–5)	3.7 (0.9)	3.9 (0.8)	3.8 (0.9)	3.8 (0.8)
Fear of spouse (1–5)*	2.4 (1.3)		2.6 (1.6)	
Partner and family violence in past 12 months				
Any IPV*				
Yes	28 (73.7%)		12 (75.0%)	
Missing	7 (18.4%)		2 (12.5%)	
Psychological				
Yes	27 (71.1%)		12 (75.0%)	
Missing	8 (21.0%)		2 (12.5%)	
Physical				
Yes	14 (36.8%)		7 (43.8%)	
Missing	3 (7.9%)		0 (0.0%)	
Sexual				
Yes	7 (18.4%)		1 (6.3%)	
Missing	3 (7.9%)		1 (6.3%)	
Reaction to survey participation				
Participated freely				
Yes	37 (97.4%)	35 (92.1%)	15 (93.8%)	13 (86.7%)
Missing	1 (2.6%)	2 (5.3%)	1 (6.3%)	2 (13.3%)
Could stop any time				
Yes	12 (31.6%)	13 (24.2%)	55 (31.3%)	7 (46.7%)
Missing	1 (2.6%)	2 (5.3%)	1 (6.3%)	2 (13.3%)
Intense emotions				
Yes	18 (47.4%)	16 (42.1%)	6 (37.5%)	6 (40.0%)
Missing	1 (2.6%)	2 (5.3%)	1 (6.3%)	2 (13.3%)
Felt meaningful				
Yes	5 (13.2%)	6 (15.8%)	2 (12.5%)	3 (20.0%)
Missing	2 (5.3%)	2 (5.3%)	2 (12.5%)	2 (13.3%)
Results will be useful				
Yes	37 (97.4%)	36 (94.7%)	15 (93.8%)	13 (86.7%)
Missing	1 (2.6%)	2 (5.3%)	1 (6.3%)	2 (13.3%)
Would participate again				
Yes	37 (97.4%)	36 (94.7%)	15 (93.8%)	12 (80.0%)
Missing	1 (2.6%)	2 (5.3%)	1 (6.3%)	2 (13.3%)

IVF invitro fertilization, *IUI* intrauterine insemination, *PTSD* post-traumatic stress disorder, *Tx* treatment, *IPV* intimate partner violence

Bold values indicate a significant difference ($p < 0.05$) between the full and analytic samples at baseline using either an independent-samples *t* test (for quantitative outcomes) or a Fisher's exact test (for categorical outcomes)

* One participant is missing data in the full sample

‡ Only asked of ever-pregnant women

Table 2 Endline descriptive statistics for analytic sample ($N = 31$)

Outcomes (Range)	Endline score		Change from baseline	
	Wife *M* (*SD*) *n* (%)	Husband *M* (*SD*) *n* (%)	Wife *M* (*SD*) *n* (%)	Husband *M* (*SD*) *n* (%)
Fertility quality of life				
Total (0–5)	3.8 (0.5)	4.2 (0.5)	**1.2 (0.6)**	**1.8 (0.9)**
Mind–body (1–5)	3.7 (0.8)	4.0 (0.8)	**1.3 (1.1)**	**1.8 (1.2)**
Emotional (1–5)	3.6 (0.7)	3.9 (0.7)	**1.3 (0.7)**	**1.6 (0.9)**
Relational (1–5)	4.2 (0.5)	4.5 (0.4)	**0.8 (0.7)**	**1.3 (0.7)**
Social (1–5)	3.7 (0.6)	4.2 (0.5)	**0.8 (0.8)**	**1.7 (0.7)**
Mental health				
Depression (1–4)	1.5 (0.3)	1.4 (0.4)	**−1.0 (0.4)**	**−1.1 (0.8)**
At or above level	5 (31.3%)	4 (26.7%)	**Δ_+: 9 (56.3%)**	**Δ_+: 8 (53.3%)**
Anxiety (1–4)	1.6 (0.4)	1.4 (0.3)	**−0.8 (0.3)**	**−1.0 (0.7)**
At or above level	6 (37.5%)	1 (6.7%)	**Δ_+: 6 (37.5%)**	**Δ_+: 11 (73.3%)**
PTSD (1–5)	1.7 (0.5)	1.6 (0.6)	**−1.7 (1.3)**	**−1.1 (1.5)**
Social support (1–7)	6.5 (0.5)	5.8 (1.2)	**0.8 (1.2)**	**2.2 (0.6)**
Coping (1–5)	4.4 (0.4)	3.9 (0.9)	0.7 (1.1)	0.2 (0.9)
Fear of spouse (1–5)	1.5 (0.7)		**−1.0 (1.2)**	
Partner and family violence				
Any IPV (Past Year)	Yes: 8 (50.0%) Missing: 1 (6.3%)	N/A	Δ_+: 5 (31.3%) Δ_-: 1 (6.3%)	N/A
Psychological (Past Year)	Yes: 8 (50.0%) Missing: 1 (6.3%)	N/A	Δ_+: 5 (31.3%) Δ_-: 1 (6.3%)	N/A
Physical (Past Year)	Yes: 3 (18.8%) Missing: 1 (6.3%)	N/A	Δ_+: 4 (25.0%) Δ_-: 1 (6.3%)	N/A
Sexual (Past Year)	Yes: 1 (6.3%) Missing: 1 (6.3%)	N/A	Δ_+: 0 (0.0%) Δ_-: 0 (0.0%)	N/A
Intervention participation				
Self-reported			N/A	N/A
Attended most sessions	9 (60.0%)	9 (60.0%)		
Attended all sessions	7 (46.7%)	6 (40.0%)		
Therapist-reported (6–10)	9.0 (1.2)	8.9 (1.3)	N/A	N/A

PTSD post-traumatic stress disorder, *IPV* intimate partner violence

Bold change scores indicate statistically significant differences ($p < 0.05$) between baseline and endline for the analytic sample using the Wilcoxon signed-rank test (for quantitative outcomes) and McNemar's test (for categorical outcomes). For categorical outcomes, the number of participants whose score changed value are shown, with Δ + indicating a positive change (e.g., experience of depression at baseline but not at endline) and Δ− indicating a negative change

was not as pronounced. Both men and women reported relatively high average coping scores at endline, but the change in coping scores from baseline to endline was not significant for either gender. Women also reported significantly less fear of their spouses at endline compared to baseline.

IPV

Women reported lower overall IPV in the last year at endline versus baseline. Of the 12 women who reported any form of IPV at baseline, four reported no IPV by endline, and one participant who reported no IPV at baseline reported experiencing IPV by endline. However, the change between baseline and endline was not significant, likely due to low power. Consistent with baseline, the most common and least common forms of IPV at endline were psychological IPV and sexual IPV respectively.

Open-ended responses and feedback

Perceptions about change noted by the therapists confirm many of these changes. From the therapists' perspective, participants were interested in the intervention and its content, were appreciative of the therapists' ability to connect the intervention to their real-life circumstances, inspired to find purpose in their circumstance and persevere through their challenges. The therapists reported that the participants established trust with one another through sharing personal experiences and their

life situations and achieved greater awareness of the source of their stressors, the impact of stress on their life, and their feelings. Therapists reported that participants demonstrated enhanced comfort in communication, problem-solving, and ability to apply these skills outside of the group setting along with the identification and use of social support.

Of the 9 men and 16 women who answered the open-ended questions on the survey, the most commonly reported responses to what was most helpful included everything, breathing exercises, problem solving, dealing with stress, and controlling emotions. A female respondent reported that the sessions felt like a rest for her. When asked what they would change about the sessions (6 men, 9 women) most said that they wouldn't change anything. Some had minor instructional suggestions, and one suggested more content on infertility itself along with one call for extending the sessions.

In addition to the participants' feedback on the intervention, the therapists and the clinician made several recommendations to improve the intervention and address the ongoing need for psychosocial services. First it was suggested that a guide should be produced for the participants so that they could follow the therapeutic process better and practice at home. Second, the findings of poor mental health, social support and violence were not unknown to the clinician; however, while many clinicians would provide whatever support they could, the stigma of mental health service seeking limited referral options. Both the therapists and the clinician recommended that the psychosocial sessions be offered on an ongoing basis, starting early in the fertility-service seeking journey and if possible, being located within the fertility clinic setting since husbands and wives often attend clinic appointments together and have to wait for some time prior to seeing the doctor. Third, while group-work was intentionally provided to reduce isolation, the therapists suggested that many couples would have preferred couple's counseling instead of gender-separate group work. Finally, the therapists noted a few logistical challenges including a lack of accessibility of the intervention site to disabled individuals, the challenge to participation in conducting the therapy sessions in the mornings on a workday, and the need to account for the likely occurrence of emotionally challenging events during therapy as two women suffered miscarriages which affected the members of the group and had to be addressed therapeutically.

Discussion

We tested the efficacy of a group CBT intervention to improve mental health and reduce IPV for couples experiencing infertility. Our results showed overall reductions in IPV, although the result was not statistically significant (research question 3.1). We observed significant improvements in fertility quality of life, depression, anxiety, and PTSD symptoms (research question 3.2) for both women and men. In terms of relationship quality (research question 3.3), wives reported significantly reduced spousal fear, and both spouses reported significantly improved social support. Those who participated in the intervention were broadly similar to those deemed eligible at baseline (research question 3.4), with men retained through endline tending to have worse mental health and both genders having worse social support scores than the full baseline sample.

This novel study, while pilot, confirms that fertility service seeking populations are at both high risk of IPV and poor mental health and that psychosocial services are well-tolerated and beneficial to patient mental well-being and improved couple functioning, especially a reduction in IPV. There is little evidence of effective IPV prevention interventions in the Middle East, and findings, when replicated against a control condition and among a larger sample of participants, could eventually be used to develop adjunctive psychosocial services and trauma-informed, IPV prevention-focused fertility services.

The prevalence estimates of IPV in the past 12 months among fertility treatment-seeking women was high. According to the most recent Jordan Population and Family Health Survey [5], 20.4% reported psychological, physical or sexual IPV in the prior 12 months compared to 73.7% among the reproductive age women in the study suggesting considerable need, especially for secondary and tertiary prevention. While comparable data are lacking for mental health, 71.1% of the men in the full baseline sample had symptoms suggestive of depression and anxiety, whereas 94.7% and 79% of women had depression and anxiety symptoms. While different methods were used, a broad comparison to data from the Institute of Health Metrics and Evaluation (IHME) shows that the sample population had very elevated rates. According to IHME statistics, 3.2% and 4.2% of men had depression and anxiety, respectively in 2019 while the prevalence estimates of depression and anxiety for women were 5.3% and 6.7%, respectively [50]. While the effectiveness of addressing these mental health conditions among the general population and fertility treatment-seeking population using CBT has been established [51–53] including in the Middle East [54–56], this use of this intervention modality among this population to treat both mental health and IPV is novel.

Potential keys to success of this intervention, in addition to an evidence-based modality, is the involvement of both partners. Involving men in IPV prevention is not a new phenomenon and recent randomized trials of IPV prevention interventions highlight the importance

of couples' involvement in effective violence prevention [34–36]. However, the research focus of infertility and IPV research has concentrated on women's experience of IPV and recommendations of how to respond to IPV survivors, namely providing psychosocial support and referrals. While this is an essential and ethical healthcare response, a focus on violence prevention has been lacking. In this study, we adapted an evidenced-based intervention to include couples, which simultaneously enhanced our violence prevention efforts, as well as improving both men's and women's psychosocial well-being which is both instrumental to violence reduction and a noteworthy outcome in itself.

The suggestion by both therapists and the clinician that psychosocial services continue to be provided and the positive response of the participants to the intervention is aligned with researchers, clinicians, and professional associations which recommend that psychosocial support be standard of care for infertility treatment [57, 58]. This is not the case in most lower- and middle-income settings, including Jordan and much of the Middle East regardless of income level. Offering mental health services in Jordan is challenged by limited mental health options and stigma associated with mental health service-seeking in addition to limited additional time for mental health services noted in this study as the predominant reason for non-participation. One option is the co-location of mental health professionals in the fertility clinic who could provide mental health treatment and psychoeducation during waiting time, which can be considerable. Tele-mental health might also be considered for ongoing psychosocial support. Telemedicine is nascent in Jordan, but growing in availability and found to be feasible [59]. It can be discreetly used avoiding the stigma associated with mental health treatment. Co-adaptation of the intervention with both men and women would help to identify the intervention modality that would be most responsive to patient needs and compatible with their daily lives. Regardless of the therapeutic mode, however, there is a need to reduce the stigma of both infertility and mental health treatment to support effective interventions alongside continued improvement in women's status to prevent IPV.

Limitations

Sample attrition at endline and differences between the analytic and full samples on a few key sociodemographic variables limit the generalizability of our findings. While not excessive, the presence of missing data reduces the amount of information available. To make full use of existing data, the study computed averages instead of sums to avoid the downward bias of summing across items in the presence of a missing response, although average scores are no longer comparable to prior studies reporting sums for these scales. The sample contained individuals who received individual therapy before and / or after group therapy, which obfuscates the benefit of group therapy alone. The eligibility criteria need to be re-assessed to exclude individuals needing individual therapy prior to group therapy and the sample size needs to be large enough to enable sub-group analyses between those who did and did not receive individual therapy after the cessation of group therapy as it would be unethical to deny needed post-group therapy because of the trial. Our results best generalize to married couples who not only are seeking infertility treatment, but also those who are more likely to attend weekly CBT sessions and, particularly for men, have higher rates of depression and anxiety and less social support. In addition to sample characteristics that may have driven attrition at endline, data collection feedback indicated that some survey administrators skipped sensitive items at endline. Endline survey items regarding IPV in the past three months (the duration of the intervention) were planned but dropped due to lack of response or administration; however, the primary outcome measure, IPV in the past 12 months was not affected, but does overlap with the time period of the baseline assessment. For the safety of the participant, the psychologists administered the surveys. The use of well-trained professional enumerators would more consistently have assessed IPV. Additionally, IPV-related items were only assessed on women; men were not assessed on IPV perpetration or norms. Hesitancy to ask or answer IPV questions and limiting IPV data to women only are not unique limitations to the current study, but such conditions prevent more robust study of how the intervention impacted IPV outcomes. Finally, the PTSD scale used in this study had been validated by the therapeutic team, but the validation was not published; therefore, future research would benefit from the use a formally validated PTSD instrument.

Conclusion

Study findings support current recommendations for the provision of psychosocial support as standard of case for the treatment of infertility given the excess burden of mental health problems and IPV in this patient population and the utility of CBT to address these problems. Co-design with couples is needed to identify the mode of intervention delivery that is most acceptable and responsive to their needs and competing demands on their time, including comparing the acceptability and benefits of group work versus couple's counseling, the creative use of clinic waiting time to offer couple or group mental health services and psychoeducation, and the potential future use of tele-mental health. Primary population-based prevention

interventions are warranted to combat the stigma of infertility and mental health service use and enhance women's status.

Abbreviations

CBT	Cognitive behavioral therapy
IHME	Institute of Health Metrics and Evaluation
IPV	Intimate partner violence
PTSD	Post-traumatic stress disorder

Acknowledgements
Not applicable.

Author contributions
CJC: conceptualization; methodology; software; analysis; writing-original draft; writing-review and editing; supervision; project administration; funding acquisition. ZAH: conceptualization; methodology; investigation; resources; writing-review and editing; supervision; project administration; funding acquisition. HB: conceptualization; methodology; investigation; resources; writing-review and editing; supervision; funding acquisition. HA: methodology; investigation; writing-review and editing; supervision; project administration. JH: conceptualization; methodology; investigation; writing-review and editing; supervision. AAA: conceptualization; investigation; writing-review and editing; supervision; project administration; funding Acquisition. ARH: methodology; software; analysis; data curation; writing-original draft; writing-review and editing; visualization. RAS: methodology; software; writing-review and editing. IB: methodology; software; analysis; data curation; writing-review and editing. RHC: conceptualization; writing-review and editing.

Funding
Funding for this study came from the Sexual Violence Research Initiative. The funders had no role in the analysis or reporting of study findings.

Availability of data and materials
The datasets used during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The study was approved by the Institutional Review Boards at Jordan University of Science and Technology (6/141/2021, 6/1/2021) and Emory University (0000321, 9/3/2021).

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

Author details
[1]Rollins School of Public Health, Emory University, Atlanta, GA, USA. [2]Faculty of Nursing/WHO Collaborating Center, Jordan University of Science and Technology, Irbid, Jordan. [3]Maternal and Child Health Nursing Department, the University of Jordan, Amman, Jordan. [4]Psychosocial Department, Institute for Family Health, King Hussein Foundation, Amman, Jordan. [5]Consultant of Reproductive Endocrinology and IVFHead of Obstetrics and Gynecology DepartmentDirector of IVF Center/ KAUH, Jordan University of Science and Technology (JUST), King Abdullah University Hospital (KAUH), Irbid, Jordan. [6]Institute for Family Health, King Hussein Foundation, Amman, Jordan. [7]IREX, Washington, DC, USA. [8]Center for the Study of Human Health and Department of Sociology, Emory University, Atlanta, GA, USA.

Received: 18 October 2023 Accepted: 5 August 2024
Published online: 11 August 2024

References

1. World Health Organization. Intimate partner violence. Geneva: World Health Organization; 2022.
2. Devries KM, Mak JY, Garcia-Moreno C, Petzold M, Child JC, Falder G, et al. The global prevalence of intimate partner violence against women. Science. 2013;340(6140):1527–8.
3. Stellar C, Garcia-Moreno C, Temmerman M, van der Poel S. A systematic review and narrative report of the relationship between infertility, subfertility, and intimate partner violence. Int J Gynaecol Obstet. 2016;133(1):3–8.
4. Lawrenz B, Coughlan C, Melado L, Fatemi HM. Ethnical and sociocultural differences causing infertility are poorly understood—insights from the Arabian perspective. J Assist Reprod Genet. 2019;36(4):661–5.
5. Department of Statistics (DOS) [Jordan], ICF. Jordan Population and Family and Health Survey 2017–18. Amman, Jordan and Rockville, Maryland, USA: DOS and ICF; 2019.
6. Clark CJ, Silverman JG, Shahrouri M, Everson-Rose S, Groce N. The role of the extended family in women's risk of intimate partner violence in Jordan. Soc Sci Med. 2010;70(1):144–51.
7. Bhat A, Byatt N. Infertility and perinatal loss: when the bough breaks. Curr Psychiatry Rep. 2016;18(3):31.
8. Luk BH-K, Loke AY. The impact of infertility on the psychological well-being, marital relationships, sexual relationships, and quality of life of couples: a systematic review. J Sex Marital Ther. 2015;41(6):610–25.
9. Luk BH, Loke AY. Sexual satisfaction, intimacy and relationship of couples undergoing infertility treatment. J Reprod Infant Psychol. 2019;37(2):108–22.
10. Mahadeen A, Mansour A, Al Halabi J, Al Habashneh S, Bani KA. Psychosocial wellbeing of infertile couples in Jordan. EMHJ-East Mediterr Health J. 2018;24(02):169–76.
11. Greil AL, Schmidt L, Peterson BD. Understanding and treating the psychosocial consequences of infertility. Oxford: Oxford Academic; 2016.
12. Douki S, Zineb SB, Nacef F, Halbreich U. Women's mental health in the Muslim world: cultural, religious, and social issues. J Affect Disord. 2007;102(1–3):177–89.
13. Fido A, Zahid MA. Coping with infertility among Kuwaiti women: cultural perspectives. Int J Soc Psychiatry. 2004;50(4):294–300.
14. Greil AL. Infertility and psychological distress: a critical review of the literature. Soc Sci Med. 1997;45(11):1679–704.
15. Verma P, Rastogi R, Sachdeva S, Gandhi R, Kapoor R, Sachdeva S. Psychiatric morbidity in infertility patients in a tertiary care setup. J Clin Diagn Res. 2015;9(9):01.
16. Bawadi H, Al-Hamdan ZM, Clark CJ, Hall-Clifford R, Hamadneh JM, Al-Sharu EE. Infertile Jordanian women's selfperception about societal violence: an interpretative phenomenological study. Int J Women's Health. 2024;16:593–603. https://doi.org/10.2147/IJWH.S451950
17. Obeidat HM, Hamlan AM, Callister LC. Missing motherhood: Jordanian Women's experiences with infertility. Adv Psychiatry. 2014;2014:7.
18. Serour GI. Medical and socio-cultural aspects of infertility in the Middle East. Hum Reprod. 2008;2008(1):34–41.
19. Inhorn MC, Fakih MH. Arab Americans, African Americans, and infertility: barriers to reproduction and medical care. Fertil Steril. 2006;85(4):844–52.
20. Inhorn MC, Birenbaum-Carmeli D, Tremayne S, Gürtin ZB. Assisted reproduction and Middle East kinship: a regional and religious comparison. Reprod Biomed Soc Online. 2017;4:41–51.
21. Inhorn MC. Middle Eastern masculinities in the age of new reproductive technologies: male infertility and stigma in Egypt and Lebanon. Med Anthropol Q. 2004;18(2):162–82.
22. Reaves SN, Hauck FR. Infertility in Muslim refugees: a review of the literature. J Refugee Glob Health. 2019;2(2):9.
23. Fisher JR, Hammarberg K. Psychological and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and future research. Asian J Androl. 2012;14(1):121.
24. Obeisat S, Gharaibeh MK, Oweis A, Gharaibeh H. Adversities of being infertile: the experience of Jordanian women. Fertil Steril. 2012;98(2):444–9.
25. Deblinger E, Pollio E, Dorsey S. Applying trauma-focused cognitive–behavioral therapy in group format. Child Maltreat. 2016;21(1):59–73.
26. Wenzel A. Basic strategies of cognitive behavioral therapy. Psychiatr Clin. 2017;40(4):597–609.

27. Hofmann SG, Asnaani A, Vonk IJ, Sawyer AT, Fang A. The efficacy of cognitive behavioral therapy: a review of meta-analyses. Cogn Ther Res. 2012;36(5):427–40.
28. Gorayeb R, Borsari AC, Rosa-e-Silva ACJ, Ferriani RA. Brief cognitive behavioral intervention in groups in a Brazilian assisted reproduction program. Behav Med. 2012;38(2):29–35.
29. Frederiksen Y, Farver-Vestergaard I, Skovgård NG, Ingerslev HJ, Zachariae R. Efficacy of psychosocial interventions for psychological and pregnancy outcomes in infertile women and men: a systematic review and meta-analysis. BMJ Open. 2015;5(1):e006592.
30. Condino V, Tanzilli A, Speranza AM, Lingiardi V. Therapeutic interventions in intimate partner violence: an overview. Res Psychother Psychopathol Process Outcome. 2016. https://doi.org/10.4081/ripppo.2016.241.
31. Hameed M, O'Doherty L, Gilchrist G, Tirado-Muñoz J, Taft A, Chondros P, et al. Psychological therapies for women who experience intimate partner violence. Cochrane Database Syst Rev. 2020. https://doi.org/10.1002/14651858.CD013017.pub2.
32. Murray LK, Kane JC, Glass N, van Wyk SS, Melendez F, Paul R, et al. Effectiveness of the Common Elements Treatment Approach (CETA) in reducing intimate partner violence and hazardous alcohol use in Zambia (VATU): a randomized controlled trial. PLoS Med. 2020;17(4):e1003056.
33. Murray SM, Van Wyk SS, Metz K, Mulemba SM, Mwenge MM, Kane JC, et al. A qualitative exploration of mechanisms of intimate partner violence reduction for Zambian couples receiving the Common Elements Treatment Approach (CETA) intervention. Soc Sci Med. 2021;268:113458.
34. McGhee S, Shrestha B, Ferguson G, Shrestha PN, Bergenfeld I, Clark CJ. "Change really does need to start from home": impact of an intimate partner violence prevention strategy among married couples in Nepal. J Interpers Violence. 2019. https://doi.org/10.1177/0886260519839422.
35. McLean L, Heise LL, Stern EA. Shifting and transforming gender-inequitable beliefs, behaviours and norms in intimate partnerships: the Indashyikirwa couples programme in Rwanda. Cult Health Sex. 2019. https://doi.org/10.1080/13691058.2019.1679394.
36. Stern E, Heise L. Sexual coercion, consent and negotiation: processes of change amongst couples participating in the Indashyikirwa programme in Rwanda. Cult Health Sex. 2019;21(8):867–82.
37. Garcia-Moreno C, Jansen H, Ellsberg M, Heise L, Watts C. WHO multi-country study on women's health and domestic violence against women: initial results on prevalence, health outcomes and women's responses. Geneva: World Health Organization; 2005.
38. Clark CJ, Bloom D, Hill A, Silverman J. A prevalence estimate of intimate partner violence in Jordan. East Mediterr Health J. 2009;15(4):880–9.
39. Fares S, Dirani J, Darwish H. Arabic validation of the hopkins symptom checklist-25 (HSCL) in a Lebanese sample of adults and older adults. Curr Psychol. 2021;40(6):2980–7.
40. Mahfoud Z, Kobeissi L, Peters T, Araya R, Ghantous Z, Khoury B. The Arabic validation of the hopkins symptoms checklist-25 against MINI in a disadvantaged suburb of Beirut, Lebanon. Int J Educ Psychol Assess. 2013;13(1):17–33.
41. Kibler JL, Toukhly O. Trauma experiences, posttraumatic stress disorder symptoms, and psychological well-being of Syrian refugees in Jordan and the United States. Traumatology. 2023. https://doi.org/10.1037/trm0000479.
42. Alhalaiqa FN, Khalifeh AH, Al Omari O, Yehia DB, Khalil MMH. Psychological problems in a sample of Jordanian healthcare workers involved in caring for patients with COVID-19: a cross-sectional study. Front Psychol. 2021;12:679785.
43. Bryant RA, Bawaneh A, Awwad M, Al-Hayek H, Giardinelli L, Whitney C, et al. Effectiveness of a brief group behavioral intervention for common mental disorders in Syrian refugees in Jordan: a randomized controlled trial. PLoS Med. 2022;19(3):e1003949.
44. Boivin J, Takefman J, Braverman A. Development and preliminary validation of the fertility quality of life (FertiQoL) tool. Hum Reprod. 2011;26(8):2084–91.
45. Boivin J, Takefman J, Braverman A. The fertility quality of life (FertiQoL) tool: development and general psychometric properties. Hum Reprod. 2011;26(8):2084–91.
46. Merhi R, Kazarian SS. Validation of the Arabic translation of the Multidensional Scale of Social Support (Arabic MSPSS) in a Lebanese community sample. Arab J Psychiatry. 2012;23:159–68.
47. Sinclair VG, Wallston KA. The development and psychometric evaluation of the Brief Resilient Coping Scale. Assessment. 2004;11(1):94–101.
48. Newman E, Willard T, Sinclair R, Kaloupek D. Empirically supported ethical research practice: the costs and benefits of research from the participants' view. Account Res. 2001;8(4):309–29.
49. World Health Organization. Putting Women First: Ethical and Safety Recommendations for Research on Domestic Violence Against Women. Geneva: WHO; 2001. Contract No.: WHO/FCH/GWH/01.1.
50. Institute of Health Metrics and Evaluation. Global Health Data Exchange. 2019.
51. Aiyenigba AO, Weeks AD, Rahman A. Managing psychological trauma of infertility. Afr J Reprod Health. 2019;23(2):76–91.
52. Sherratt K, Lunn S. Evaluation of a group programme of mindfulness-based cognitive therapy for women with fertility problems. J Obstet Gynaecol. 2013;33(5):499–501.
53. Rooney KL, Domar AD. The relationship between stress and infertility. Dialogues Clin Neurosci. 2018;20(1):41.
54. Mosalanejad L, Koolaee AK, Jamali S. Effect of cognitive behavioral therapy in mental health and hardiness of infertile women receiving assisted reproductive therapy (ART). Iran J Reprod Med. 2012;10(5):483.
55. Shargh NA, Bakhshani NM, Mohebbi MD, Mahmudian K, Ahovan M, Mokhtari M, et al. The effectiveness of mindfulness-based cognitive group therapy on marital satisfaction and general health in woman with infertility. Global J Health Sci. 2016;8(3):230.
56. Mosalanejad L, Koolaee AK, Behbahani BM. Looking out for the secret wound: the effect of E-cognitive group therapy with emotional disclosure on the status of mental health in infertile women. Int J Fertil Steril. 2012;6(2):87.
57. Gameiro S, Boivin J, Dancet E, de Klerk C, Emery M, Lewis-Jones C, et al. ESHRE guideline: routine psychosocial care in infertility and medically assisted reproduction—a guide for fertility staff. Hum Reprod. 2015;30(11):2476–85.
58. Boivin J, Appleton T, Baetens P, Baron J, Bitzer J, Corrigan E, et al. Guidelines for counselling in infertility: outline version. Hum Reprod. 2001;16(6):1301–4.
59. Obeidat AZ, El-Salem K. A national telemedicine program in the Kingdom of Jordan-Editorial. Ann Med Surg (London). 2021;62:145–9.

Publisher's Note