The Impact of Group Psychological Interventions on Distress in Infertile Women

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Infertile women express higher levels of distress than fertile women, with distress peaking between the 2nd and 3rd year. The purpose of this study was to determine whether group psychological interventions could prevent this surge. One hundred eighty-four women who had been trying to conceive between 1 and 2 years were randomized into either a cognitive-behavioral group, a support group, or a control group. All experimental participants attended a 10-session group program. Participants completed psychological questionnaires at intake and again at 6 and 12 months. Substantial attrition occurred, particularly in the control group. The cognitive-behavioral and support participants experienced significant psychological improvement at 6 and 12 months compared with the control participants, with the cognitive-behavioral participants experiencing the greatest positive change.

Key words: female infertility, group psychological interventions, support groups, cognitive-behavioral therapy, mind/body

It has been assumed since biblical times that infertility is associated with heightened levels of anxiety and depression. In the Book of Samuel, the story of Hannah illustrates the psychological impact of infertility (Schiff & Schiff, 1998). Hannah failed to conceive “year by year,” which tormented her to the point where she exhibited symptoms of a clinical depression, including constant weeping, anorexia, and overwhelming feelings of sadness.

The psychological impact of infertility has been well documented. In a prospective, longitudinal study of 59 women presenting for infertility treatment (Downey et al., 1989), 9% of the infertility patients met the criteria for a major depressive episode, in contrast to 3% of the control group. In addition, half of the infertility patients reported changes in their sexual functioning, and 75% reported changes in their mood. In a similar study of infertile women, 11% of the infertile sample met the criteria for a major depressive episode, compared with 4% of the fertile sample (Downey & McKinney, 1992). Wright, Allard, Lecours, and Sabourin (1989) reported that infertile women were significantly more distressed than control participants on the majority of psychological parameters studied. Garner, Arnold, and Gray (1984) found that depressive symptoms, as measured by the Beck Depression Inventory (BDI; Beck & Steer, 1987), were present in 34% of the women prior to an in vitro fertilization cycle (IVF) and in 64% after the cycle was determined to be unsuccessful. Freeman, Garcia, and Rickels (1983) reported that 16% of women preparing for an IVF cycle had scores of 70 or more on one or more subscales of the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1989). Bell (1981) using the Schedule for Affective Disorders and Schizophrenia (Endicott & Spitzer, 1978), found that 40% of infertile women had mild to moderate symptoms of depression and 7% had severe symptoms. When compared with women with heart disease, cancer, chronic pain, or HIV + status, infertile women reported equivalent levels of anxiety and depression to all but the chronic pain patients (Domar, Zuttermeister, & Friedman, 1993). It should be noted that findings regarding the prevalence of distress and depressive symptoms in infertile women...
are not entirely consistent (see Stanton & Danoff-Burg, 1995, for a review). However, the several studies described previously suggest that at least some women who confront infertility are at risk for heightened distress and depressive symptoms.

When depressive symptoms do occur in infertile women, they appear to peak between the second to third year of infertility (Domar, Broome, Zuttermeister, Seibel, & Friedman, 1992). Three hundred thirty-eight infertile women and 39 healthy women completed the BDI and the Center for Epidemiological Studies Depression Scale (Spitzer et al., 1992). The infertile women had significantly higher depression scores and twice the prevalence of depressive symptoms than the controls. Women with a two- to three-year history of infertility had higher depression scores than all other infertile women and significantly higher when compared with women with infertility durations of less than 1 year or more than 6 years.

Cognitive therapy is increasingly accepted as being effective in the treatment of depression with advantages over other forms of counseling, especially with infertile women (Hunt & Monach, 1997). Several studies with cancer patients combined support with cognitive–behavioral techniques, and benefits included decreased psychological distress, longer life span, and decreased mortality (Helgeson & Cohen, 1996). In a recent study with multiple sclerosis patients (Schwartz, 1999), a group intervention that emphasized coping-skills training provided greater advantages in well-being and coping than a peer telephone support group. Cognitive–behavioral approaches have been effective in reducing symptoms and decreasing health costs in patients with a wide variety of conditions (e.g., heart disease, hypertension, chronic and acute pain), including cardiac, abdominal, orthopedic, and dental surgery and invasive diagnostic procedures (Mandle, Jacobs, Arcari, & Domar, 1996).

Although support groups are the most common psychological intervention offered to infertile women in this country, there is a paucity of research on their efficacy. However, evidence suggests that the application of cognitive–behavior therapy (CBT) to infertile women in group format contributes to significant psychological improvement. In three separate nonrandomized, uncontrolled studies (Domar, Seibel, & Benson, 1990; Domar, Zuttermeister, Seibel, & Benson, 1992; Domar, Zuttermeister, & Friedman, 1999), infertile women who attended a 10-session CBT program experienced significant improvement pre- to postprogram on all assessments of distress, including depressive symptoms, anxiety, and anger. Published randomized, controlled, prospective studies are needed to determine the efficacy of psychological interventions in decreasing distress. In addition, there have been no attempts to intervene with infertile women early in the treatment process, to try to prevent the development of depression and other symptoms as treatment progresses. The following study is part of a preventive intervention trial to determine the impact of group psychological interventions on several factors, including viable pregnancy rates and psychological status. The viable pregnancy data have been reported elsewhere (Domar et al., 2000).

The goal of this study was to determine if group psychological interventions could prevent the anticipated increase in psychological distress as duration of infertility increases. Because the two most common group interventions currently offered to infertile women are support groups or cognitive–behavioral groups (also known as mind/body; Domar et al., 1990; Domar, Zuttermeister, et al., 1992), these were the two interventions chosen to investigate. It was hypothesized that women who participated in a cognitive–behavioral group would experience the least amount of psychological distress during the study period, followed by women who participated in a support group, followed by the control participants.

**Method**

**Participants**

Women who had been trying to conceive for between 1 and 2 years were recruited for this study from a variety of sources. Brochures were placed in the waiting rooms of infertility specialists’ offices, and mailings were sent to appropriate patients from collaborating physicians’ practices. In addition, public service announcements, paid advertisements, and local television stories were used to enhance recruitment.

Eligible participants met the following criteria: English-speaking, not currently practicing any relaxation technique, not participating in any individual or group psychological treatment, not currently taking psychotropic medication, and not being clinically depressed. The absence of clinical depression was a condition of the funding agency and the Beth Israel Deaconess Medical Center internal review board. Women who were clinically depressed prior to randomization were referred for appropriate psychiatric care rather than facing the possibility of being randomized to the control group.

This study was approved by the ethics review board at the Beth Israel Deaconess Medical Center. All participants who came in for the Time 1 interview read and signed the informed consent form.

Over 2,000 women responded to the recruiting effort, but more than 90% had been trying to conceive for more than 2 years. They were referred to the clinical infertility mind/body program; the local chapter of Resolve, a national educational and support organization, for information on support groups; and/or to individual psychotherapists specializing in infertility.

Of the 212 women who came in for the Time 1 visit, 28 met our criteria for potential clinical depression: a score above 15 on the BDI, a score above 11 on the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967) or criteria for clinical depression on the Structured Clinical Interview for the DSM-III-R (SCID; Spitzer, Williams, Gibbon, & First, 1992). These women were referred to the Department of Psychiatry for assessment.

One hundred eighty-four women were randomized, according to a computer-generated random-numbers table, into one of three groups: cognitive–behavioral (CB), support (S), or a routine-care control group (C). There were two randomization procedures. When recruitment was active, participants were randomized into one of the three groups. However, when fewer participants were enrolling, participants were randomized into the C group versus the intervention group, with the intervention group randomly alternating between CB and S to initiate intervention groups of adequate size. Thus, during active recruitment, after approximately 36 participants were recruited, there were enough participants so that the intervention groups could begin (approximately 12 participants in each group). By randomizing to control versus intervention, only approximately 24 participants had to be recruited prior to proceeding. Ninety-nine percent of the study participants were Caucasian women. Information regarding the income status of the study participants was not gathered.

During the second year of the study, the randomization procedure again had to be altered because of the difficulty in recruiting appropriate participants. To commence intervention groups in a timely fashion, there were 15 participants who were randomized to one of the two intervention groups but were switched to the other intervention before that group began. The reason for this alteration was that each group intervention required 8 to 12 participants per group. Thus, it was possible that several women were randomized to a particular group but the other members needed to begin...
that group had not yet been enrolled. Rather than have participants wait 6
or more months for their group to start and risk having them discontinue
participation, participants were switched. A total of 10 S and 5 CB
participants were moved to the other intervention group after randomiza-
tion, but prior to the beginning of the group. There were never any
participants switched between intervention and control groups. Because
participants were aware of their original group assignment, all statistical
analyses were conducted with participants' original assignment (intent-to-
treat analysis).

Of the 184 participants, 63 were randomized into the C group; 65 to the
S group; and 56 to the CB group. Thirty-eight of the C participants
discontinued participation during the first year because of dissatisfaction
with group assignment. Fourteen joined a clinical CB program, 6 joined a
Resolve group, 2 entered psychotherapy, 3 did biofeedback therapy, 3 did
not like being part of a clinical trial, and 12 provided no reason for their
withdrawal. Seventeen of the S participants did not participate in the
study, because of dissatisfaction with group assignment or disliking being part
of a clinical trial. Nine CB participants discontinued from the study, because
of various reasons, including low interest in being in a group intervention.

All participants were informed that they would come in every 6 months
for psychological testing until they achieved a pregnancy or until they
reached an infertility duration of 4 years. In addition, participants were told
that if they joined any external psychological intervention (individual,
couples, or group), began taking psychotropic medication or stopped trying
to conceive, they would no longer be followed for the study. In addition,
S and C participants were advised that participation in any type of relax-
ation practice would render them ineligible for continuation. Although this
may have sounded coercive, participants were reassured that should they
feel the need to pursue outside treatment, they would be encouraged to do
so. The subsequent attrition rates demonstrate that participants, especially
the controls, did indeed feel free to discontinue participation.

A total of 63 C, 55 CB, and 65 S participants completed the Time 1
psychological assessment. For an undetermined reason, psychological data
from 1 CB participant is missing. Because of the exceptionally high
pregnancy rates, especially in the intervention participants (as well as the
above-mentioned dropouts and discontinuation criteria), 14 C, 20 CB,
and 29 S participants completed the Time 2 assessment 6 months later, and
only 2 C, 7 CB, and 11 S participants completed the Time 3 visit 12 months
after recruitment. All cited group assignments reflect the original assign-
ment, not actual group attendance.

Psychological Measures

Each psychological testing session was conducted by one of two clinical
psychologists who remained blind to participant assignment and included
the completion of six psychological scales and two psychiatric interviews.
Measures included the Profile of Mood Scale (POMS; McNair, 1971), the
State–Trait Anxiety Inventory (STAI; Spielberger, 1988), the BDI, the
HRSD, the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1972), the
Marital Distress Scale (MDS; Pearlin & Schooler, 1978), the Health-
Promoting Lifestyle Profile (HPLP; Walker, Sechrist, & Pender, 1987),
and the SCID. In addition, each participant completed an information form
at the Time 1 visit, which included questions on demographics, duration of
infertility, and current medical treatment.

Chosen to assess general psychological functioning, the POMS was
designed to assess affective states within the past week and yields six mood
scales and a total mood disturbance score. In a normative sample, the alpha
coefficients for internal consistency range from .84 to .95, and the test-
retest reliability is somewhat lower, ranging from .65 to .74, which is
expected because the test was designed to assess fluctuating mood states.
Content, factorial, predictive, and construct validity have all been supported.

The STAI is a 40-item self-report scale consisting of 20 state and 20 trait
statements. As expected, the test–retest reliability is higher for the Trait
scale, ranging from .65 to .86, and for the State scale it is .16 to .62
(Spielberger, 1988).

Three measures assessed depressive symptoms. The BDI has been used
both for detecting possible depression in the general population and for
assessing the intensity of depression in psychiatric patients. Alpha coeffi-
cients for internal consistency range from .79 to .90 (Beck & Steer, 1987).
Assessments of the validity of the BDI demonstrate satisfactory content,
discriminant, construct, and concurrent validity. The HRSD is a structured
assessment of depressive symptoms designed to be administered by a
trained professional. It is not designed for diagnostic purposes but instead
for assessing the severity of a patient's condition. It has been recommended
that both depression scales be used when multiple outcome measures are
needed (Lambert, Christensen, & DeJuliis, 1983). The SCID was chosen as
the clinically based interview because it is widely used in studies on
depression and anxiety. This study included two skilled interviewers and one
specific patient population. For this study, the SCID was used to clarify
the status of high scores on the BDI and HRSD and was administered at the
first testing session to screen out any participants with preexisting depres-
sive symptoms.

The RSES, a measure of self-esteem, is a widely used instrument with both
adult and adolescent populations. The test–retest reliability is .93
(Rosenberg, 1972). Positively and negatively worded statements are pre-
sented alternatively.

Marital distress was assessed because the impact of psychological in-
terventions on this construct have never been assessed in infertile samples.
The MDS is a nine-item self-report questionnaire with item factor loadings
ranging from .66 to .83 (Pearlin & Schooler, 1978).

The HPLP is designed to measure patterns and determinants of health-
promoting behaviors, as well as the effects of interventions on these
behaviors. The seven subscales are Self-Actualization ("am enthusiastic
and optimistic about life"), Health Responsibility ("report any unusual
signs or symptoms to a physician"), Exercise ("exercise vigorously for
20–30 minutes at least 3 times per week"), Nutrition ("choose foods
without preservatives or other additives"), Interpersonal Support ("discuss
personal problems and concerns with persons close to me"), Stress Man-
agement ("am aware of the sources of stress in my life"), and Overall
Health-Promoting Style (the mean of all the other scores). Alpha reliability
coefficients are .92 for the total score and a range of .70 to .90 for the
subscales (Walker, Sechrist, & Pender, 1987).

Psychological Interventions

Participants randomized into either of the two intervention groups met
on an individual basis with the group leader prior to the group starting. The
participant's medical and psychosocial history were reviewed during this
session. In addition, the schedule and format of the group were presented.
Alice D. Domar and Diane Clapp alternated leading both types of groups
to eliminate the possibility of leader bias. Because Alice D. Domar had
experience leading cognitive–behavioral groups and Diane Clapp was
experienced in leading support groups, each leader was thoroughly trained
by the other in the skills needed to run the other type of group. The control
participants received no psychological intervention.

Intervention groups met for 2 hr on a weekly basis for 10 weeks on a
weekend day. All sessions were tape-recorded, and a random sample
of 5% was reviewed by an experienced clinical psychologist to ensure that
the group leaders maintained the integrity of the intervention contents (for
example, that stress-management strategies were not introduced in the
support group). Group leaders were scored on a 7-point scale ranging from
1 (complete deviance from the session content) to 7 (strict adherence
to session content). Compliance with session content was 100%, reflecting
the fact that the group leaders maintained program integrity during all
monitored sessions.

The CB group was modeled after the group mind/body programs that
have been offered in the Division of Behavioral Medicine at Beth Israel
Deaconess Medical Center since 1987 (Domar et al., 1990; Domar, Zuttermeister, et al., 1992). Participants in the CB group were introduced to a wide variety of techniques, including relaxation-response training, cognitive restructuring, emotional expression, and nutrition and exercise information relevant to infertility. The cognitive–behavioral intervention was modified from the clinical model for this study so that the format of the two groups were identical and only the actual content of the sessions themselves differed. Thus, components offered in the clinical program (Domar et al., 1999), such as sharing and/or support time, husbands attending three of the sessions, and guest speakers, were omitted for this research study.

The support groups were modeled after groups offered through Resolve, an organization that offers standardized support groups in every state. The support group was designed to be representative of groups offered throughout the United States, not a minimal-treatment or quasicontrol group. Support group participants spent the Ist hr of each session "checking in" with each other on infertility treatments or issues that may have arisen since the previous week. The 2nd hr was spent on a different topic each week, including the impact of infertility on self-esteem, their marriage, family and friends, spirituality, and job.

Statistical Analysis

The following characteristics were compared between the three groups: age, highest level of education, months of attempted conception, current medical treatment, and type of current medical treatment. The three groups were compared on demographic and background characteristics (i.e., age, education, months of attempted conception, current use of medical treatment, type of medical treatment) using analysis of variance (ANOVA) or chi-square tests. Baseline psychological tests were compared by ANOVAs between patients who remained in the study at 6 months and those who left the study because of pregnancy or loss to follow-up. A 3 × 2 ANOVA of study group (C, S, CB) by attrition (retained, attrited) was performed on baseline assessments on each of the psychological scales. The group comparisons of psychological outcomes at 6 and 12 months were performed using analyses of covariance, adjusting for each baseline psychological measure. The results are presented for each group as adjusted mean changes from baseline.

Results

Sample Characteristics

The demographic characteristics of the study sample are summarized in Table 1. There were no statistically significant differences in age, education, months of infertility, whether or not participants were receiving medical treatment or type of medical treatment at the time of randomization. Table 2 shows that there were also no significant differences on any of the baseline psychological questionnaires.

Of the initial 55 CB participants, 20 became pregnant by 6 months and thus did not return for the Time 2 interview and 15 CB participants declined to come in for the interview. Similarly, 12 of the 65 S participants became pregnant by 6 months and 24 dropped from the study. Of the 63 C participants, 5 became pregnant and 44 dropped from the study. The analyses below are based on the remaining 63 participants who completed the 6-month interview. At baseline, these 63 participants were less depressed, as rated by the POMS (M = 7.9, SD = 4.6), F(1, 177) = 5.27, p = .02, and by the BDI (M = 10.5), F(1, 178) = 5.18, p = .02, than the patients who left the study (HRSD: M = 9.7, SD = 5.0; POMS Depression: M = 14.0, SD = 11.1). The patients who remained in the study also had less fatigue as rated by the POMS (M = 7.3, SD = 5.5), F(1, 179) = 6.06, p = .01, lower overall POMS Total Mood Disturbance (M = 21.4, SD = 34.2), F(1, 178) = 4.02, p = .045, and lower Marital Distress scores (M = 16.6, SD = 6.0), F(1, 175) = 4.27, p = .04, than those who left the study (Marital Distress: M = 18.3, SD = 5.8). POMS Fatigue: M = 9.5, SD = 6.4; Total Mood Disturbance: M = 31.0, SD = 35.3). In the 20 baseline psychological measures, there was only one instance, POMS anxiety, where the impact of attrition was different in the three study arms, F(2, 176) = 3.31, p = .04. In the C group (M = 3.7, SD = 3.5) and S group (M = 5.1, SD = 6.4), the participants who remained in the study had lower anxiety at baseline than the participants who left the study (M = 7.3, SD = 6.6, and M = 8.7, SD = 7.5, respectively), whereas in the CB group, the participants who remained in the study (M = 8.1, SD = 7.4) had higher levels of anxiety at baseline than those who stopped participation (M = 6.0, SD = 5.9).

Psychological Improvement at 6 Months

Table 3 shows that significant between-group differences emerged on the following variables: HPLP subscales of Stress-Management Skills and Style, STAI State Anxiety, Marital Distress, and the POMS subscales of Anxiety, Vigor, Confusion, and Total Mood Disturbance. For all significant analyses, inspections of adjusted mean change scores revealed an improvement for CB and S group participants and a deterioration for C participants in Stress Management Skills, Style, Anxiety (STAI State subscale and POMS), Marital Distress, Vigor, Confusion, and POMS Total Mood Disturbance. When the two intervention groups were compared, the CB participants had significantly better, or psychologically healthier, scores on the HPLP Stress-Management Skills, F(1, 46) = 19.90, p = .0001, and Style, F(1, 46) = 7.10, p = .011, the POMS Vigor subscale, F(1, 46) = 6.60, p = .014, the BDI, F(1, 46) = 4.10, p = .049, and RSES, F(1, 46) = 4.78, p = .034.

When the data analysis was performed on actual group attendance, rather than using the intent-to-treat design, the results did not change (see Table 3). All between-group significant differences remained, with several differences being stronger. Actual attendance included a total of 24 CB and 25 S participants.

### Table 1
Demographic Characteristics for All Randomized Participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cognitive-behavioral (n = 56)</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>M = 33.96, SD = 4.32</td>
</tr>
<tr>
<td>Years of education</td>
<td>M = 16.91, SD = 2.02</td>
</tr>
<tr>
<td>Months of infertility</td>
<td>M = 18.68, SD = 3.66</td>
</tr>
<tr>
<td>Receiving medical treatment</td>
<td>50%</td>
</tr>
</tbody>
</table>

Note. df = 2 and 181 for age, education, and infertility duration. Chi-square analyses were performed on 184 participants.
Table 2  
**Psychological Measures at Baseline**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Study group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CB (n = 55)</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>BDI</td>
<td>8.1</td>
</tr>
<tr>
<td>HRSID</td>
<td>9.3</td>
</tr>
<tr>
<td>Self-Act</td>
<td>3.0</td>
</tr>
<tr>
<td>Health Res</td>
<td>2.3</td>
</tr>
<tr>
<td>Exercise</td>
<td>2.2</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3.0</td>
</tr>
<tr>
<td>IS</td>
<td>3.2</td>
</tr>
<tr>
<td>SMS</td>
<td>2.1</td>
</tr>
<tr>
<td>Style</td>
<td>2.7</td>
</tr>
<tr>
<td>STAI</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>40.5</td>
</tr>
<tr>
<td>Trait</td>
<td>39.6</td>
</tr>
<tr>
<td>RSES</td>
<td>33.5</td>
</tr>
<tr>
<td>MDS</td>
<td>18.4</td>
</tr>
<tr>
<td>POMS</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>6.7</td>
</tr>
<tr>
<td>Depression</td>
<td>13.2</td>
</tr>
<tr>
<td>Anger</td>
<td>9.4</td>
</tr>
<tr>
<td>Vigor</td>
<td>12.9</td>
</tr>
<tr>
<td>Fatigue</td>
<td>9.2</td>
</tr>
<tr>
<td>Confusion</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>29.1</td>
</tr>
</tbody>
</table>

Note.  BDI = Beck Depression Inventory; HRSID = Hamilton Rating Scale for Depression; HPLP = Health-Promoting Lifestyle Profile; Self-Act = Self-Actualization; Health Res = Health Responsibility; IS = Interpersonal Support; SMS = Stress-Management Skills; STAI = State Trait Anxiety Inventory; RSES = Rosenberg Self-Esteem Scale; MDS = Marital Distress Scale; POMS = Profile of Mood Scale.

**Psychological Improvement at 12 months**

Very few participants remained in the study at 12 months, because of pregnancy or dropping out. There were a total of 7 CB participants, 11 S participants, and 2 C participants. However, four significant differences emerged. The CB participants (M = 1.4, SD = 1.4) and C participants (M = 5.0, SD = 5.7) had significantly lower scores on the HRSID than did the support group (M = 8.4, SD = 5.0), F(2, 16) = 6.13, p = .011. The CB participants had higher scores on the HPLP subscales of Stress-Management Skills (M = 2.9, SD = 0.6), F(2, 16) = 4.20, p = .034, Interpersonal Support (M = 2.9, SD = 0.3), F(2, 16) = 4.64, p = .026, and Style (M = 3.4, SD = 0.4), F(2, 16) = 5.04, p = .02, than did the C participants (Stress-Management Skills: M = 1.9, SD = 0.7; Interpersonal Support: M = 2.9, SD = 0.2; Style: M = 2.3, SD = 0.5) and S participants (Stress-Management Skills: M = 2.4, SD = 0.3; Interpersonal Support: M = 3.3, SD = 0.4; Style: M = 2.8, SD = 0.2).

**Discussion**

Women who participated in one of two group psychological interventions experienced significant improvements on a number of psychological measures as they continued to attempt conception. These differences were not due to any initial group differences on demographic or medical treatment parameters.

The C participants, as expected, showed increases in psychological distress over time. This is consistent with research showing that distress reported by infertile women increases over time (Berg & Wilson, 1991). The intervention participants in contrast, not only did not get worse over time but actually showed improvements on several psychological parameters. Thus, the hypothesis that it is possible to prevent worsening of distress through psychological interventions was supported.

This study had a number of methodological limitations. The first was the high level of attrition in all groups (mostly due to pregnancy in CB and S participants), and the disproportionate number of dropouts in the control group. Most of the C participants dropped out at the beginning of the study because of dissatisfaction with group assignment, and several dropped later because of a need to pursue some psychological intervention. Numerous C participants reported to the research assistant that as the study progressed, they felt unable to cope without some sort of psychological support. Because the S and CB participants were receiving help, high levels of distress were not noted as reasons for discontinuing participation. However, if the most distressed C participants dropped out of the study, this would indicate that controls who remained were less distressed. The fact that a number of significant differences remained between the intervention and control groups at Time 2 suggests a powerful treatment effect.
The second issue was the problem with randomization. The randomization schedule was altered midstudy from a three-group randomization to a two-group randomization. In addition, 15 intervention participants were switched from one group to another before the intervention group began. This issue does not affect the significant differences between the two intervention groups and the C group but it does interfere with the interpretation of data comparing the two intervention groups. It was hypothesized that the CB participants would experience significant improvement when compared with the S participants. Using the conservative but appropriate intent-to-treat analysis, on several measures the CB participants did indeed experience significant improvements over the S participants. However, this issue does interfere with recommendations for clinical applications.

Finally, although experimental participants were treated in therapy groups, statistical analyses were carried out assuming independent responses from all participants. If the shared experience of a therapy group influenced the responses of group members in a common way, then this may have led to inflated Type I error rates. Many studies have suggested that infertile women report heightened levels of negative psychological symptoms. In addition to the discomfort caused by psychological distress, there is increasing evidence that distress, most frequently identified as depressive symptoms, may actually impair conception. Lapane et al. (1995) showed that women with a history of depressive symptoms were twice as likely to experience infertility than women without such a history. Two recent studies on women undergoing IVF showed that depressed women are significantly less likely to conceive than women who are not depressed (Demyttenaere et al., 1998; Thiering et al., 1993). A third study indicated that depression hampers conception; depressed women who attended a CB program specifically designed to treat depression and anxiety subsequently experienced a 60% conception rate, in contrast to a 24% rate in women who were not depressed (Domar & Dreher, 1997). The pregnancy data from the current study supported this hypothesis; participants from either intervention group experienced significantly increased viable pregnancy rates when compared with the C participants (p < .0044; Domar et al., 2000).

Increasing evidence suggests that cognitive-behavioral approaches lead to symptom reduction. Over the past two decades, this approach had been supported in research on cardiovascular disease, smoking cessation, weight loss, eating disorders, and chronic pain (Domar & Dreher, 1997). The use of CBT with women's health conditions is more recent, yet there is now research to support the efficacy of this approach in reducing both physical and psychological symptoms in premenstrual syndrome...
menopausal symptoms (Irvin, Domar, Clark, Zuttermeister, & Friedman, 1996; Freedman & Woodward, 1992), ovarian cancer (LeKander, Furst, Rotstein, Hursti, & Fredrikson, 1997), and breast cancer (Domar, Irvin, & Mills, 1997; Spiegel, Bloom, Kraemer, & Gottheil, 1989). Findings of the present study add to this growing literature, although it should be noted that CBT was not uniformly superior to the support group.

The limitations of this study preclude making definitive recommendations regarding psychological treatment for infertility patients. However, the preventive intervention model appears to be supported by this study. Participants who received group interventions prior to exhibiting significant psychological distress showed improvement over time, in contrast to the C participants, who worsened. The CB participants experienced the greatest improvement.

Future research is needed to determine at which point during the infertility process psychological interventions are most effective; what kind of psychological intervention is most effective in treating, rather than preventing, distress; which specific component of CB is the most effective with infertile women; and finally, whether the successful treatment of distress is associated with increased pregnancy rates.

In summary, the results from this study provide preliminary evidence that it is possible to prevent psychological distress with group psychological interventions and that a cognitive-behavioral group intervention appears to be the most efficacious. Although definitive recommendations for psychological interventions for infertile women should be delayed until the results can be replicated, because of the noninvasive and inexpensive nature of these interventions, women in the early stages of infertility treatment should be advised that group interventions may lead to both improved psychological state as well as increased pregnancy rates.

References


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