Patterns of suffering and social interactions in infertile men: 12 months after unsuccessful treatment

To cite this Article: Peronace, Laura A., Boivin, Jacky and Schmidt, Lone, 'Patterns of suffering and social interactions in infertile men: 12 months after unsuccessful treatment', Journal of Psychosomatic Obstetrics & Gynecology, 28:2, 105 - 114

To link to this article: DOI: 10.1080/01674820701410049
URL: http://dx.doi.org/10.1080/01674820701410049
Patterns of suffering and social interactions in infertile men: 12 months after unsuccessful treatment

LAURA A. PERONACE1, JACKY BOIVIN1, & LONE SCHMIDT2

1School of Psychology, Cardiff University, Cardiff, Wales, UK, and 2Institute of Public Health, University of Copenhagen, Copenhagen, Denmark

(Received 17 January 2007; accepted 6 April 2007)

Abstract
Research shows that men diagnosed with male factor infertility experience more suffering than men with infertility due to other causes, and that it is socially unfavourable to be diagnosed with male factor infertility resulting in secrecy surrounding diagnosis, sometimes to the point that women take the blame for the couples' infertility. We investigated mental and physical health, support, and psychological and social stress in men (N = 256) prior to and after 12 months of unsuccessful treatment according to their diagnosis: unexplained, female factor, male factor, or mixed. Results suggest that men do not differ by diagnosis on any of the variables tested. When treatment was not successful, all men showed increased suffering in the form of decreased mental health, increased physical stress reactions, decreased social support, and increased negative social stress over time. These findings indicate that involuntary childlessness is difficult for all men, and is not dependent on with whom the cause lies. There was also a high level of agreement between couples and medical records on the cause of the couples' fertility arguing against the idea that women take the blame for male factor infertility.

Keywords: Infertility, diagnosis, distress, stress, support, secrecy, male factor

Introduction
Male factor infertility is involved in up to 50% of all cases of infertility but there is a limited amount of research that examines the effect of a male factor diagnosis on a man’s physical and psychological well-being. The research that does exist has generated two main propositions with regards to men and male infertility. First, men with male factor infertility are proposed to suffer more compared to men with other infertility diagnoses [1–4]. Second, male factor infertility is proposed to have such a social stigma that it produces much negative social stress, and a culture of secrecy and protectiveness to the extent that women sometimes even take the blame for the couple’s childlessness [5–7].

It has been reported that men’s experience of male factor infertility was more intense then that of men with female factor infertility [3], in that the former reported higher levels of infertility distress [2], and increased anxiety over time [4]. Kedem [1] found that men with suspected male factor infertility reported increased self-blame, lower self-esteem and increased social isolation compared to men without suspected male infertility. Other studies do not find a difference according to diagnosis in male well-being. For example, Lee [2] found that distress, marital and sexual satisfaction did not differ according to diagnosis. Connolly [4] reported an increase rather than a decrease in overall physical health in men with male factor infertility. Van Balen [7] did not find any differences among diagnostic groups with respect to how their social network reacted to their diagnosis, and most infertile men reported positive reactions when they disclosed to others.

These variations in research findings may be due to methodological issues, in particular to the fact that studies tend to be cross-sectional and make assessments at different time points in the medical experience, for example at the time of diagnosis [1,8,9], during treatment [2,3,10] or at other time points [11,12] making it difficult to delineate the source of the stress. These findings highlight the need for longitudinal evaluations. Given the considerable amount of time couples now spend in treatment, it would be important to assess the effect of diagnosis on male well-being, especially in couples who are unsuccessful with treatment. Many studies have shown that couples report significant distress when treatment fails [13–17]. Van Balen [18] reported that
couples with long-term infertility, who have faced much treatment failure, report higher levels of depression, low satisfaction with their sex lives, and low levels of well being. In the present study we examined whether men with a male factor diagnosis experienced a greater increase in distress in a 12 month period of unsuccessful treatment than did men with other diagnoses.

Van Balen proposed that spouses may be motivated to protect each other from the stigma of infertility and this may be particularly true when the infertility was due to a male factor [7]. One of the key features of social stigma described by Goffman [19] is a discredited moral status. Couples have reported feeling morally judged with regards to their infertility and decisions to use assisted reproductive technologies [20]. Negative comments have included such things as infertility is an act or even punishment from God [20]. In support of Goffman’s theory Carmeli [5] reported that it was common for couples to report secrecy and misdirection with regards to their infertility diagnosis. For example, women reported telling family and friends that the source of the couple’s infertility was hers when, in fact, the diagnosis was male factor. It has also been reported that men perceive infertility to be more socially acceptable for a women than for a man [6]. In addition, men reported feeling that there was social support for infertile women whereas they felt ridiculed [5]. In the present study we examined the stigma of male infertility in a number of ways. First, if couples were more motivated to protect each other, one would expect disagreements to exist between self-reported diagnosis and diagnosis indicated by the spouse but more importantly by the medical records, especially in male factor infertility. Van Balen [7] found that 38% of couples disagreed with medical records with regards to their diagnosis. Second, men with male factor infertility would be less likely to talk to other people regarding their infertility and reasons for their infertility as compared to men with any other infertility. Third, if stigma is an issue one would also expect men with male factor infertility to receive less understanding and more negative comments from those around them than men with any other infertility diagnosis.

The nature of the relationship between social environment and psychological well-being is still unclear. Although it is well accepted that they interact [21], the direction of that interaction it is less clear. Some have found that social support predicts psychological well-being and health [22] or even buffers the effects of stress on physical and mental health [23] whereas others have found the reverse in that chronic personal stress has a negative impact on the social environment [24]. To address this issue we examined to what extent personal and social stress at the start of treatment predicted mental health and perceptions of the social environment 12 months later.

The aims of the present longitudinal study were to investigate the issues of suffering and the negative social environment experienced by men with male factor infertility in a sample of men who were unsuccessful with treatment. Men were participating in the Copenhagen Multi-Centre Psychosocial Infertility (COMPI) research program, which is a longitudinal psychosocial investigation of infertile couples in Denmark (see Schmidt et al. [25] and Boivin et al. [26]). Mental health, fertility problem stress, coping and social support were assessed at the onset of treatment and 12 months later, and compared in men across four diagnostic groups. Based on the research reviewed it was hypothesized that the stigma of male factor infertility would manifest in greater reporting inaccuracies with respect to diagnosis and more suffering and social stress in men with male factor infertility compared to men with other diagnoses. Further, we predicted that pre-treatment psychological and social stress would predict these same variables at 12 months follow-up.

Methods

Sample

The final sample consisted of 256 Danish men whose partners had not become pregnant during a 12 month period of treatment and who had participated in the first (Time 1 [T1]) and 12-month follow-up assessment (Time 2 [T2]) in the COMPI research program. The sample represented 77.6% of non-pregnant couples (N = 330) in the COMPI project (N = 818), with remaining men (n = 74) from non-pregnant couples not eligible because they had not responded to the question regarding their diagnosis in the T1 questionnaire.

Men in the final sample had been infertile longer than men in pregnant couples in the COMPI sample (n = 488) (t(1,659) = 5.67 p < 0.05; M = 4.37, SD = 2.37; M = 3.97, SD = 1.86, respectively) and had attempted more treatment cycles (t(1,659) = 50.18 p < 0.001), M = 2.59, SD = 1.34; M = 1.85, SD = 1.28, respectively) in the 12 month duration of this study. No other differences were found between men in subsequently pregnant versus non-pregnant couples.

Materials

The COMPI questionnaire booklet contains numerous questions about health, support, stress, and coping with infertility (see Schmidt et al. [25] for a more detailed description of materials). Only those questions relevant to the present study are described. All questionnaires were translated into Danish and then back translated into English unless validated Danish versions already existed. Translations were
done by two people independently, back-translated into English by two other people, and finally compared for conceptual correspondence. Differences were resolved by a third native English speaker.

In the present study, internal reliability was measured by Chronbach alpha coefficients and was above 0.70, and considered good for all measures.

Sociodemographic and medical information. These questions were used to obtain demographic (e.g., age, years married, children, social position) information. Also included focus on being a parent (e.g., ‘Having a child is very important to me’) which contained three items rated on a five-point likert-scale from ‘strongly disagree (1) to strongly agree (5)’. Medical information included diagnosis, number of years of infertility, previous treatment experience, number of treatment cycles in the last 12 months).

Fertility problem stress. The Fertility Problem Stress Inventory [27,28], was designed to assess overall disruption and stress created by fertility problems in relation to specific life domains. Subscales included ‘Personal stress’ which contained six items, ‘Social stress’ which contained four items, and ‘Marital stress’ which contained four items (see Boivin et al. [26] for a more detailed description of the subscales). Items were rated on two different likert-scales, five-point and four point respectively (i.e., either ‘strongly disagree (1) to strongly agree (5)’ or ‘none at all (1) to a great deal (4)’). For all variables, higher scores indicated greater FP stress. The range was 6–26 for the personal subscale, 4–16 for the social subscale, and 4–18 for the marital subscale.

Mental and physical health. General mental health was assessed using the nine-item mental health and energy-vitality subscale of the Short-Form-36 Inventory (SF-36:[29,30]). Participants were asked about their mental health and energy levels over the past four weeks and rated each statement (e.g., ‘Have you been a very nervous person’) on a six-point response key ranging from ‘all of the time’ (6) to ‘none of the time’ (1). The validity of the SF-36 subscales has been established in numerous medical populations [31]. Higher scores on this measure indicated better mental health (possible range 9–54).

Physical health was assessed using a nine-item ‘Physical stress reactions’ subscale of the Stress Profile questionnaire [32] and an additional two items from the Pennebaker PILL inventory [33]. Items on this subscale assessed a variety of physical reactions (e.g., ‘racing heart’, ‘muscle tension’) which could occur as a result of stressful situations. The measure has shown good psychometric properties: it has high internal reliability and can discriminate between groups experiencing high and low work stress [32]. Participants indicated how frequently they experienced each symptom in the past four weeks using a five-point response key ranging from ‘very often’ (5) to ‘never’ (1). The total score was used for analyses with higher scores indicating more physical stress reactions (possible range 1–45).

Coping. The 19-items used for this measure were adapted from the Ways of Coping (WOC) Checklist, a process-oriented measure of coping derived from Lazarus and Folkman’s transactional model of stress [34–36] (See Schmidt et al. [37] for a more detailed description). Participants were requested to rate each item according to how they coped with infertility using a four-point response key ranging ‘not used’ (1) to used a ‘great deal’ (4). Higher scores on this factor indicated more coping effort, possible range from 5–19.

Social environment. Social relations were assessed using four items from the theoretical model of support and strain derived in the Danish Longitudinal Health Behaviour Study [38]. Social relations were examined using two 4-item variables; support and understanding from those around you (i.e., spouse, family, friends), and negative reactions and comments from those around you. Both were assessed using a five point likert-scale ranging from ‘always’ (5) to ‘never’ (1) with higher scores indicating greater understanding or more negative comments.

Openness about infertility. Men’s willingness to discuss their infertility with people around them was assessed for three types of information: not being able to have children, reason’s why they could not have children, and emotional feelings. Categorical responses were scored on a three-point response key: (1) not to other people, (2) only to close people, (3) to most people I know.

Treatment cycles and outcome. At the 12-month follow-up, participants were asked to detail their treatment experiences since completing the first questionnaire. First, participants were asked to indicate the types of treatments they had received and the number of treatment cycles they had undergone. Second, participants were asked to indicate whether they had achieved a pregnancy or not and if they had, whether their partner was currently pregnant or had delivered.

Diagnostic information. Data about diagnosis was collected from three sources. First, men were asked to indicate the cause of their fertility problems by checking one or more of the following: my partner’s tube(s) is/are blocked, my partner has irregular ovulation or anovulation, I have decreased sperm quality, no cause was proven, other. Four categories
were derived from this information, and which determined to which diagnostic group the couple was assigned for the purposes of analysis. The unexplained group was assigned if only ‘no cause was proven’ was indicated, the female factor group was assigned if ‘my partner’s tube(s) is/are blocked’ and/or ‘my partner has irregular ovulation or anovulation’ was indicated, the male factor group was assigned if ‘I have decreased sperm quality’ was indicated, the mixed group was assigned if a combination of female factor and male factor were indicated. Second, diagnostic information was also obtained from the spouse who separately completed this questionnaire item. Finally, for a subset of men, \( n = 90 \), the factual diagnosis as recorded by medical doctors was extracted from patients’ medical charts.

**Procedure**

Infertility clinics were contacted to enlist their participation in the COMPI project. Interested clinics were given a presentation that detailed what would be required of clinic staff and patients. All clinics \( n = 5 \) agreed to distribute questionnaires. Clinics were provided with all necessary materials including questionnaire booklets for men and women as well as pre-addressed, stamped envelopes for the return of completed questionnaires. Couples received questionnaires approximately two weeks prior to treatment (T1) and again 12 months later (T2). Spouses were instructed to complete questionnaires separately, within 10 days of receipt and to post the completed questionnaires in the envelopes provided. Participants who did not wish to participate returned an enclosed non participating form. If the questionnaires or non participating forms were not received, participants were sent a maximum of two reminders at 10-day intervals. Data for this study were collected between January 2000 and August 2001 (T1) and between January 2001 and August 2002 (T2).

The Scientific Ethical Committee of Copenhagen and Frederiksberg Municipalities assessed the study; the study complied with ethical standards according to the Helsinki II declaration. The Danish Data Protection Agency also approved the study.

**Data analysis**

Analysis of Variance (ANOVA) was used to assess differences between diagnostic groups in age, years married, years infertile, focus on being a parent, previous treatment experience, number of treatment cycles in the 12 month study period. For the categorical or ordinal variables whether you have children or not, social position, and do you talk to other people regarding your infertility, chi-squared was computed \( \chi^2 \). To assess change over time, a 4 (Diagnosis: Unexplained, Female, Male, Mixed) \( \times 2 \) (Time: T1, T2) mixed model ANOVA was computed with time as the repeated measure. The dependent variables for these analyses were: mental health, physical stress symptoms, negative comments, understanding, coping, and personal, social and marital fertility problem stress. Regression was used to assess the relationship between mental well being (i.e., SF-36) and social environment (i.e., support and understanding, negative comments). Time 2 social environment was predicted from Time 1 mental health, after controlling for Time 1 social environment female age and years infertile. Time 2 mental health was predicted from Time 1 social environment controlling for Time 1 mental health, female age and years infertile. The alpha level was set at \( p < 0.05 \).

**Results**

**Concordance about diagnosis among men, their partner and doctors**

Men were categorized into four groups based on their self-reported diagnosis on the questionnaire, as described previously. The distribution according to self-reported diagnosis was: unexplained \( n = 81 \) (31.6%); female \( n = 79 \) (30.9%); ‘male’ \( n = 75 \) (29.3%), and mixed \( n = 21 \) (8.2%). The diagnosis reported by men was not significantly different \( \chi^2(3, n = 330) = 5.71, p = 0.126 \) from the diagnosis given by their partner. Overall there was 87.9% \( n = 225 \) agreement between spouses. In the 12.1% of couples who disagreed, 2.7% disagreed about unexplained diagnosis, 3.5% disagreed about female factor diagnosis, 5.1% disagreed about male factor diagnosis, and 0.8% disagreed about mixed diagnosis. In the sub-sample where medical records could be obtained men’s self-reported diagnosis did not differ significantly from the diagnosis reported in the medical records \( \chi^2(3, n = 90) = 2.76, p = 0.430 \) with agreement in 80% of the cases. Of the 20% of men who disagreed with the medical records, 2.2% disagreed about unexplained diagnosis, 4.4% disagreed about female factor diagnosis, 5.6% disagreed about male factor diagnosis, and 7.8% disagreed about mixed diagnosis.

**Demographic and medical characteristics**

Table I shows summary statistics for sample socio-demographic and medical characteristics. Overall there were no differences between diagnostic groups on any of these variables.

Overall men were in their mid 30 s, \( M = 34.0 \) years old, \( SD = 5.0 \) years. Couples had been married almost 8 years \( M = 7.6 \) years, \( SD = 3.7 \) years,
the majority of couples had no children either together or from previous relationships (77.7%, n = 199). Most men (93.4%, n = 239) were employed and were skilled or white collar workers (60.9%, n = 156). Also, men were moderately to highly focused on being a parent (M = 12.9, SD = 2.2).

There was no significant difference between diagnostic groups according to medical information. The average duration of infertility was (M = 4.3, SD = 2.4) years, with a range of <1 year to 16 years. Prior to the start of the present study couples had had previous treatment mainly consisting of intrauterine insemination (86.7% of the treated sample, n = 222) but also in vitro fertilization/intracytoplasmic sperm injection (IVF/ICSI) (13.3% of treated sample, n = 34) or both. In the male factor infertility group, 5.3% (n = 4) had used insemination with donor sperm. In terms of treatment during the 12-month study period, the majority of couples, 91.8% (n = 275) underwent IVF or ICSI treatment. The average number of treatment cycles was (M = 2.6, SD = 1.3) and ranged from 1 to 8, and was not statistically different between diagnostic groups.

**Personal, social, and marital stress**

Figure 1 shows personal, social, and marital stress over time by diagnostic category. For personal stress there was no significant main effect of time or diagnostic category ($F(1, 245) = 0.32, p = 0.57$; $F(3, 245) = 1.02, p = 0.38$, respectively), nor was there an interaction ($F(3, 245) = 0.54, p = 0.65$). Social stress significantly increased over time ($F(1, 245) = 17.79, p = 0.006$) but diagnosis ($F(3, 245) = 1.25, p = 0.16$) and the interaction ($F(3, 245) = 0.716, p = 0.54$) were not significant. Marital stress significantly increased over time ($F(1, 245) = 20.56, p = 0.000$) but the main effect of diagnosis ($F(3, 245) = 1.18, p = 0.32$) and the interaction ($F(3, 245) = 0.42, p = 0.74$) were not significant.

**Mental health, physical stress symptoms and coping**

The results revealed that for mental health there was a main effect of time ($F(1, 247) = 16.45, p < 0.001$) where mental health decreased after 12 months of treatment failure. The main effect of diagnosis ($F(3, 247) = 0.81, p = 0.49$) and the interaction were not significant ($F(3, 247) = 0.81, p = 0.35$) for this variable (Table I).

Table I also demonstrates that after 12 months of treatment failure physical stress symptoms increased for all groups ($F(1, 248) = 10.61, p < 0.001$), with no differences among diagnostic groups ($F(3, 248) = 0.30, p = 0.83$), and no significant interaction ($F(3, 248) = 0.94, p = 0.42$).

Finally, coping effort increased over time ($F(1, 249) = 57.47, p < 0.001$), but there was no

---

Table I. Summary statistics for sociodemographic, medical, mental and physical health, and coping variables by diagnostic group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unexplained</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male age (M, SD)</td>
<td>34.3 (4.74)</td>
<td>34.2 (5.09)</td>
<td>33.4 (4.52)</td>
<td>33.5 (6.72)</td>
</tr>
<tr>
<td>Years married (M, SD)</td>
<td>8.30 (4.10)</td>
<td>7.12 (3.64)</td>
<td>7.49 (3.35)</td>
<td>7.67 (3.51)</td>
</tr>
<tr>
<td>Previous children (n, % yes)</td>
<td>21 (25.93)</td>
<td>21 (26.58)</td>
<td>13 (17.33)</td>
<td>2 (9.52)</td>
</tr>
<tr>
<td>Social position (n, %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>5 (6.17)</td>
<td>4 (5.06)</td>
<td>6 (8.00)</td>
<td>2 (9.52)</td>
</tr>
<tr>
<td>Unskilled</td>
<td>13 (16.05)</td>
<td>22 (27.85)</td>
<td>16 (21.33)</td>
<td>5 (23.81)</td>
</tr>
<tr>
<td>Skilled</td>
<td>56 (69.14)</td>
<td>45 (56.96)</td>
<td>43 (57.33)</td>
<td>12 (57.14)</td>
</tr>
<tr>
<td>Professional-Executive</td>
<td>7 (8.64)</td>
<td>8 (10.13)</td>
<td>10 (13.33)</td>
<td>2 (9.52)</td>
</tr>
<tr>
<td><strong>Medical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years infertile (M, SD)</td>
<td>4.46 (1.95)</td>
<td>4.31 (3.22)</td>
<td>4.01 (2.54)</td>
<td>5.48 (3.16)</td>
</tr>
<tr>
<td>Treatment experience prior to the study (n, %)</td>
<td>74 (91.36)</td>
<td>68 (86.08)</td>
<td>62 (82.67)</td>
<td>18 (85.71)</td>
</tr>
<tr>
<td>Treatment cycles in the 12 month study period (n, %)</td>
<td>7 (8.64)</td>
<td>11 (13.92)</td>
<td>13 (17.33)</td>
<td>3 (14.29)</td>
</tr>
<tr>
<td><strong>Psychological and Physical Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Health (M, SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>13.00 (3.92)</td>
<td>13.11 (4.30)</td>
<td>13.47 (4.42)</td>
<td>13.90 (4.56)</td>
</tr>
<tr>
<td>T2</td>
<td>14.20 (5.77)</td>
<td>13.37 (5.12)</td>
<td>14.58 (5.29)</td>
<td>13.62 (4.44)</td>
</tr>
<tr>
<td>Mental Health (M, SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>43.96 (6.76)</td>
<td>44.83 (6.41)</td>
<td>43.80 (5.86)</td>
<td>43.33 (10.02)</td>
</tr>
<tr>
<td>T2</td>
<td>41.25 (8.77)</td>
<td>43.46 (6.94)</td>
<td>42.27 (7.83)</td>
<td>43.43 (7.90)</td>
</tr>
<tr>
<td>Coping effort (M, SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>10.27 (1.46)</td>
<td>10.27 (2.07)</td>
<td>10.77 (1.48)</td>
<td>10.75 (1.91)</td>
</tr>
<tr>
<td>T2</td>
<td>11.11 (1.81)</td>
<td>11.23 (1.72)</td>
<td>11.39 (1.74)</td>
<td>11.04 (1.77)</td>
</tr>
<tr>
<td>Focused on being a parent (M, SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>12.8 (2.11)</td>
<td>12.9 (2.39)</td>
<td>13 (2.08)</td>
<td>12.9 (2.12)</td>
</tr>
</tbody>
</table>

SD, standard deviation; T1, time 1; T2, time 2; M, Mean.
Figure 1. Mean scores (± SE) for personal, social, and marital stress at Time 1 (T1) and after 12 months of treatment (Time 2, T2) by infertility diagnosis. Asterisk denotes a statistical significant difference between T1 and T2 across all diagnostic groups (*p < 0.01; **p < 0.001).
significant main effect of diagnostic category \(F(3, 249) = 1.62, \ p = 0.29\), or interaction \(F(3, 249) = 1.03, \ p = 0.38\) (Table I).

**Social environment**

Figure 2 shows the mean values (± SE) for negative comments where the main effect of time \(F(1, 231) = 21.53, \ p < 0.001\), diagnosis \(F(3, 231) = 3.1, \ p < 0.05\) and the interaction \(F(3, 231) = 2.93, \ p < 0.05\) were significant. Follow-up tests revealed that the ‘unexplained’ group received more negative comments over time then did the ‘female’ and ‘male’ factor groups (\(p < 0.05\)).

Figure 2 also shows the mean values (± SE) for understanding experienced by the men where there was a main effect of time \(F(1, 231) = 205.8, \ p < 0.001\). Men reported less understanding over time but there was no significant main effect of diagnostic category \(F(3, 231) = 1.18, \ p = 0.32\) or interaction \(F(3, 231) = 1.57, \ p = 0.20\).

Chi-square revealed that there were no differences between groups on the willingness of men to talk to people around them; the majority of men preferred to talk only to close people about not being able to have children (\(n = 147, 57.4\%\)), reason’s why they could not have children (\(n = 154, 60.2\%\)), and emotional feelings (\(n = 133, 52\%\)).

**Relationship between social environment and mental health**

Results of the regressions revealed that poorer mental health at Time 1 (\(\beta = -0.177 \ t(227) = -1.93, \ p < 0.05\)) predicted more negative comments at Time 2 after controlling for age, years infertile and negative comments at Time 1 \(F(4, 230) = 12.66, \ p < 0.01\). Poorer mental health at Time 1 also marginally predicted less understanding at Time 2 after controlling for age, years infertile and understanding at Time 1 \(F(4, 230) = 2.09, \ p = 0.083\). The regressions analysis predicting Time 2 mental health from Time 1 social environment were not significant.

**Discussion**

Three principal findings emerged from this investigation. First, there was no evidence to support the idea that there was more stigma or protectiveness among men with male factor infertility. Second, men with male factor infertility did not suffer more than men with other diagnoses, and all men showed increased suffering over time when treatment was not successful. These findings indicate that infertility and failed treatment are a challenge and emotionally demanding for most men.

One main finding was that most men were open about their fertility problems. Past research has shown poor agreement between husbands and wives report of infertility medical information [7,39] particularly for recall of information related to male factor infertility [5]. One cause of this discrepancy may be the desire of couples to protect the man from the stigma of infertility [7]. In the present investigation agreement was high between spouses and between men and physicians reports, in the 20% or so of cases where disagreement existed there was no evidence of greater dispute in the group of men with male factor infertility. We also found that men across diagnostic groups reported equal levels of talking to other people (e.g., close friends, family) about their

![Figure 2](image-url). Men’s mean scores of support variables, negative comments and understanding at Time 1 and after 12 months of treatment at Time 2 by infertility diagnosis. Asterisk demotes a statistical significance between T1 and T2 across all groups (\(p < .001\)). Cross denotes statistical significance between unexplained group, and male and female groups (\(p < .05\)).
infertility, its causes and its emotional impact on their lives at Time 1 when social environments were reported as being supportive. Together these results would suggest that most men, including those with male factor infertility, were open about their fertility problems.

These findings diverge from those of previous research, and this may be due to several factors. First, a discrepancy between spouses or between patient and medical records may be due to miscommunication rather than to secrecy. For example, Van Balen [7] found that 38% of couples could not recall the correct diagnosis after speaking with their physicians. Today couples may be more informed about fertility issues compared to a decade ago, for example through greater use of the internet to access fertility information therefore leading to more accurate knowledge among patients [40]. Second, if the possible use of donor sperm and the subsequent withholding of that information from potential offspring was the reason for secrecy in past work [41], then the low incidence of treatment with donor sperm in our study (i.e., 5%) may explain why there is more openness about diagnostic information in our work compared to before the use of ICSI became conventional.

A second main finding of the study was evidence that men's social network became more negative and less supportive over time, with greater overall social stress. It has previously been found that depending on the social group investigated (family and close friends) social support is overall positive [7]. This study finds evidence in line with these findings however, due to the longitudinal nature of this design we also demonstrated that social support was not stable and in fact deteriorated over time for all men, particularly men with unexplained infertility. It has previously been reported that personality, social behaviour, and anxiety levels change in men with unexplained infertility [42], and that women with unexplained infertility are more depressed and more anxious than controls [43]. However, other studies report no differences between unexplained infertility versus other infertility diagnosis in couples [44,45], which is more consistent with the majority or results found here. Overall our results show that men perceive their social environment to be less supportive over time.

A third main finding was that across all diagnostic groups, suffering increased over time when treatment was not successful indicating that suffering was not specific to male factor diagnosis or disproportionate for this group. Suffering included psychological deterioration as evidenced by increased general mental anguish (e.g., despondency, irritation) and physical stress reactions (e.g., muscle weakness, chest pain) and a concomitant increase in the coping effort required to manage fertility problems. This pattern of results indicates that it is persistent involuntary childlessness that is taxing and leads to suffering and not simply the self-blame of being the cause of the couples’ infertility, as would be suggested if men with male factor infertility suffered more then men with other diagnoses.

An important issue to address, given the parallel deterioration in psychological suffering and social environment is to what extent these two life aspects impact on each other. The link between psychological and social suffering is likely to be bi-directional. DeLongis [21] found people with unsupportive social environments were more likely to experience somatic problems. Also, Cohen and Wills [23] found that social support attenuated or ‘buffered’ the effects of stressful events and others have found that support was predictive of well-being [22]. However, Thoits [46] reported that some stressful events could result in a loss of social support. Specifically chronic stress (e.g., depressive symptoms, death of a close family member) can lead to increased cost for the social network eventually leading to reduced social support. In the present study, it was found that the causal path was stronger for the influence of mental health on perceptions of the surrounding environment (e.g., negative comments and understanding). A persistent lack of treatment success and the increased emotional suffering which it causes may act as a chronic stressor that places a great burden on social networks. This burden may cause a breakdown in social support eventually contributing to further increased stress over time.

In conclusion our findings contribute to the much needed research on men’s reaction to infertility and infertility diagnosis. Our results showed that men with male factor infertility do not suffer more then men with infertility due to other causes. When treatment is not successful men’s physical and mental health deteriorates, as well as, their supportive environments. Also, we did not find evidence to suggest that secrecy exists with regard to diagnosis. It is important that men’s suffering regardless of diagnosis be recognised and dealt with. This research combined with the findings that increased stress can predict treatment outcomes [26] suggest that it is important to conduct further investigation regarding interventions on suffering which may then lead to increase in treatment success.

Acknowledgement
The Infertility Cohort is a part of The Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme initiated by Dr L.Schmidt, University of Copenhagen, 2000. The programme is a collaboration between the public Fertility Clinics at Brædstrup Hospital; Herlev University Hospital; The Juliane Marie Centre, Rigshospitalet; Odense
University Hospital. This study has received support from the Danish Health Insurance Fund (Jnr. 11/097–97), the Else and Mogens Wedell-Wedellsborgs Fund, the manager E. Danielsens and Wife’s Fund, the merchant L. F. Fights Fund, and the Jacob Madsen and Wife Olga Madsens Fund. We would also like to thank Cardiff University and Serono International for their contributions.

References


**Current knowledge on this subject**

- Some research has suggested that men with male factor infertility suffer more than men with other diagnoses and that there is much social stigma associated with male factor infertility.
- A culture of secrecy exists with regards to male factor infertility and women sometimes take the blame for the couple’s infertility regardless of the diagnosis.

**What this study adds**

- All men suffer equally regardless of diagnosis.
- If treatment is not successful, social environment deteriorates for all men.