How patient-centred care relates to patients’ quality of life and distress: a study in 427 women experiencing infertility

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BACKGROUND: The aim of this study was to investigate to what extent patients’ experiences with fertility care are associated with their quality of life (QoL), and levels of anxiety and depression.

METHODS: We performed a cross-sectional questionnaire study within 29 Dutch fertility clinics, including women with fertility problems. Through multilevel regression analyses, associations between patients’ QoL (FertiQoL) and distress [anxiety and depression; Hospital Anxiety and Depression Scale (HADS)] and their experiences with fertility care [patient-centredness questionnaire (PCQ)-infertility] were determined. For all multilevel models, \( R^2 \) and intra-cluster correlation coefficients were calculated.

RESULTS: This study included 427 non-pregnant patients who filled out the FertiQoL, HADS and PCQ-infertility (response rate 76%). Multilevel regression analysis showed significant associations between the PCQ total scale, the total FertiQoL scale (\( \beta = 0.25 \)), and HADS subscales (\( \beta = -0.22 \) and \( -0.18 \)). Of the variance in patients’ experiences, 13% (\( = R^2 \)) could be explained by their perceived QoL, 12% by their level of anxiety and 10% by their level of depression.

CONCLUSIONS: Patient-centredness in fertility care and the patients’ QoL and anxiety and depression scores are related. Paying attention to these variables could lead to positive care experiences and improved patient-centredness of care. Future research should focus on identifying causal relationships among these variables.

Key words: patient-centredness / quality of care / quality of life / distress / infertility

Introduction

Traditionally, quality of fertility care focuses on outcome measures, such as effectiveness and safety (Nyboe Andersen et al., 2009; de Mouzon et al., 2010). However, in the last decade, patient-centredness has increasingly been recognized as an important component of high-quality fertility care (IOM, 2001; Dancet et al., 2010; Van Empel et al., 2010a). Patient-centred care is one of the six quality-of-care dimensions and is defined as ‘providing care respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions’ (IOM, 2001). The patient-centredness questionnaire-infertility (PCQ-infertility) was developed and validated as a reliable instrument to measure patient-centredness of fertility care by asking patients about their experiences with care (Van Empel et al., 2010a). By measuring the level of patient-centredness, clinics will have detailed insight into their performance according to patients, and this will allow tailored quality improvement and benchmarking (Van Empel et al., 2010a).

The delivery of patient-centred care could bring patients many benefits, especially when it comes to their perceived well-being. Tailoring care in a patient-centred way could remove some of the emotional burden of infertility, often seen in terms of poorer quality of life (QoL) and higher anxiety and depression (Verhaak et al., 2007; Van Empel et al., 2010a; Aarts et al., 2011; Boivin et al., 2011). This potentially beneficial relationship between patient-centredness and a patient’s well-being has often been discussed (Van Empel et al., 2010a; Dancet et al., 2010), but has not yet been investigated in reproductive medicine.
A methodological problem of using patient self-report measures such as the PCQ-infertility as indicators for quality of fertility care is that patients’ experiences may be influenced by their well-being. It is known that performance on different types of cognitive tasks, including completing questionnaires, can be influenced by the patient’s mood (Forgas, 2011). A positive mood can enhance recall of happy memories (Forgas et al., 1984; Phillips et al., 2002), whereas negative affect can result in negative memory biases in patients’ self-report measures (Bradley et al., 1995). This influence might especially apply to infertile patients because infertility is associated with a high emotional burden (Fassino et al., 2002; Verhaak et al., 2007). Because of this emotional impact (Smeenk et al., 2001; Verhaak et al., 2007), it would not be surprising if a patient’s well-being impacted on their reports about experiences with care. It is thus important to know to what extent patient negative or positive mood influences their evaluation of the patient-centred performance of their fertility clinic. A strong association between these would indicate the need to take well-being into account when we measure patient-centredness using the PCQ-infertility.

To gain more insight into these associations, the objective of this cross-sectional study was to determine how patients’ reported experiences with fertility care are related to their well-being (i.e. QoL, anxiety and depression).

Materials and Methods

Setting and study design

This cross-sectional study was nested in another study which aimed primarily at collecting couples’ care experiences and validating the PCQ-infertility (Van Empel et al., 2010a). In order to address secondary research questions (Aarts et al., 2011; the present study) during this large multicentre study, data were also collected on well-being and levels of distress from a subset of the female partners of the participating couples. A total of 29 Dutch fertility clinics from three regions in the Netherlands approved participation in data collection.

Recruitment of patients and inclusion and exclusion criteria

In the Netherlands, every patient visiting a Dutch hospital is assigned a code for insurance purposes according to the patient’s diagnosis and treatment. Using this diagnosis treatment combination (DBC) coding system, participating fertility clinics were able to extract from their system the addresses of all patients who underwent medically assisted reproduction in their clinic between April and June 2009, varying from IVF and ICSI to ovulation induction and intrauterine insemination. From these lists of patients (n = 3061 individual women), we selected a random sample of 1200 to participate in the total study, and 1189 actually received the questionnaires. The number of sampled patients per clinic depended on the size of their infertility outpatient clinic, ranging from 25 patients for smaller clinics to 75 for the largest IVF centres. For the study described in this paper, we randomly selected two-thirds of patients per clinic because of practical reasons (n = 785). Per fertility clinic, we alternately allocated patients to participation in the study. The time interval between the last treatment date and the date of filling out the questionnaire could vary between 1 month (June–July 2009) and 5 months (April–September 2009). The full selection procedure is depicted in Fig. 1. When completing the questionnaires, most women were expecting or undergoing another fertility treatment; others were awaiting the outcome of the previous fertility treatment or had recently achieved pregnancy. Those who had become pregnant during the study were excluded from the analyses, as most questions of FertiQoL are no longer applicable (e.g. ‘Do your fertility problems interfere with your day-to-day work or obligations?’).

Ethical approval

The institutional ethics committee of Radboud University Medical Centre Nijmegen reviewed and provided ethical approval for this research project to proceed.

Data collection

We sent patients the survey and they received a reminder card 3 weeks after the initial mailing. After another 2 weeks, non-responders received an additional reminder with a new copy of the questionnaire.

Measurement instruments

In fertility care, we can reliably assess well-being by QoL and distress (i.e. anxiety and depression), using the FertiQoL questionnaire and the Hospital Anxiety and Depression Scale (HADS) (Aarts et al., 2011).

The internationally developed and validated FertiQoL questionnaire consists of 26 questions. Besides two general items, it contains 24 specific items covering four subscales of QoL: Mind–Body (e.g. ‘Do your fertility problems interfere with your day-to-day work or obligations?’), Relational (e.g. ‘Have fertility problems strengthened your commitment to your partner?’), Social (e.g. ‘Are you socially isolated because of fertility problems?’) and Emotional (e.g. ‘Do you feel able to cope with your fertility problems?’). The optional FertiQoL treatment module was not used in this study. A higher score on one of the subscales means a better QoL, with subscale scores ranging from 0 to 100 (see Boivin et al., 2011, and Aarts et al., 2011, for further information on FertiQoL development and validity). The Dutch FertiQoL has shown good reliability in a previous study: Cronbach’s α varied between 0.72 and 0.91 (Aarts et al., 2011).

The HADS was used to measure anxiety and depression in our study population. This questionnaire comprises 14 items: a 7-item anxiety subscale and a 7-item depression subscale. Cronbach’s α of these subscales was 0.82 and 0.83, respectively, in the same sample of Dutch patients experiencing infertility (Aarts et al., 2011). Subscale scores range from 0 to 21: a higher score means higher levels of anxiety and depression, respectively (Zigmond and Snaith, 1983; Spinhoven et al., 1997). A score of 8 is set as a cut-off value suggestive of a psychiatric condition (Zigmond and Snaith, 1983; Spinhoven et al., 1997).

Finally, we used the PCQ-infertility (46 items), a validated instrument measuring the level of patient-centredness in fertility care, to assess patients’ experiences with care. This questionnaire is subdivided into seven different domains: accessibility (e.g. ‘Was it a problem for you to contact staff if you had any questions?’), information (e.g. ‘How often did your physician take you seriously?’), respect for patients’ values (e.g. ‘How often did your physician show an interest in your personal situation?’), continuity and transition (e.g. ‘How often did you have an appointment with the same physician?’), patient involvement (e.g. ‘Was decision-making shared with you, if preferred?’) and competence (e.g. ‘How often was your physician well-prepared for an appointment?’) (Van Empel et al., 2010a). Cronbach’s α was high among these domains (range 0.64–0.83) (Van Empel et al., 2010a). Higher scores on the total PCQ scale or one of these subscales (range 0–3) means a higher level of patient-centredness (see Van Empel et al., 2010a, for details of the PCQ-infertility).
Data analyses

We entered data into an SPSS database (version 16.0 for Windows®, SPSS Inc., Chicago, IL, USA). As mentioned above, we excluded pregnant women from the analyses. We performed a multilevel regression analysis to adjust for clustering of patients within the same clinics. Additionally, the validation study of the PCQ-infertility had shown that the level of patient-centredness differed significantly between clinics (Van Empel et al., 2010a). We standardized variables to the unit of measurement which differed between the three instruments (i.e. 0–3, 0–21, and 0–100, respectively). We therefore converted the scores of the PCQ variables and the HADS variables to the same unit of measurement as the FertiQoL scores (0–100) by multiplying these by 33.33 and 4.76, respectively. In the analyses, we applied these standardized scores, but for the descriptive statistics, we used original units of measurement. We chose to use the level of patient-centredness as the dependent variable and patient’s QoL and level of anxiety and depression as the independent variables, because this way we emphasized patient-centredness as an important outcome measure of quality of fertility care.

We thus considered the total scale of the PCQ the dependent outcome variable. Per patient, a mean PCQ total score was calculated by summing up the responses to the individual items and dividing these scores by the number of items completed (Van Empel et al., 2010a). Patients who filled out half or less of the items within a subscale were to be excluded from further analyses. However, this was never the case in this study.

We used the patient’s QoL, and levels of anxiety and depression as potential correlates for the level of patient-centredness. Consequently, we considered the total scale and all subscales of the FertiQoL, and HADS-anxiety and HADS-depression scales as independent variables. For the total scale and subscales of the FertiQoL, we calculated a mean score per patient (range 0–100) (Boivin et al., 2011). HADS subscale scores were calculated by summing up the responses to the individual items. Additionally, as the patient characteristics ‘type of treatment’ and ‘women’s level of education’ were found to be associated with the level of patient-centredness in the validation study of the PCQ (Van Empel et al., 2010a), we used these variables as additional case-mix adjusters.

We computed multilevel regression models to determine the effects of the independent variables on the level of patient-centredness. The first model contained no covariates (model 0) and was the reference to which we compared seven other models with adjustment for three independent variables, which were: type of treatment, women’s education and one of QoL, anxiety or depression. Models 1, 2 and 3 contained the total FertiQoL, HADS-anxiety and HADS-depression scores, respectively. Models 4–7 adjusted for the FertiQoL subscales ‘Emotional’, ‘Mind–Body’, ‘Relational’ and ‘Social’, respectively. In the eighth model, we entered HADS scales and the total FertiQoL all together to determine what independent variable, taking into account the others, would be the most important predictor in this model for patient-centredness of care. In this last model, we did not exclude non-significant variables, because we aimed with this particular analysis to elicit what independent variable had the strongest association with the dependent variable, when including the others.

Furthermore, we calculated intra-cluster correlation coefficients (ICCs) to evaluate which part of the variance in patient-centredness is related to differences between fertility clinics. We determined this level of relatedness of clustered data by comparing the variance within clusters with the variance between clusters (range 0–1). In this study’s analyses, a cluster was set at the level of fertility clinics. We calculated the ICCs using the 0-model as described before.
Finally, we determined explained variance by calculating $R^2$, indicating what percentage of variance in patient-centredness is attributable to the level of patient’s QoL, anxiety and depression. Significance for all analyses was set at $P < 0.05$.

**Results**

**Respondents**

In total, 594 patients filled out the PCQ-infertility, the FertiQoL questionnaire and the HADS (response rate 76%). Of these, 167 women (19%) were pregnant and were therefore excluded from further analyses. The median age of the remaining participants ($n = 427$) was 33 years (range 20–45). Of these women, 8% had a non-Dutch ethnicity and 42% of them had a high educational level (i.e. higher professional education or university according Dutch standardized definitions). Their median duration of infertility was 34 months and 72% of women were childless. Infertility was due to a male or female factor in 26 and 27% of cases, respectively. In 10%, both male and female factors were reported, and 37% of patients suffered from unexplained infertility. Half of participants underwent IVF and/or ICSI treatment. Table I presents their mean scores on the total scale and subscales of all three measurement instruments.

**Multilevel regression model**

Table II describes the results of the multilevel regression analyses. When adjusted for ‘type of treatment’ and ‘women’s level of education’, Models 1, 2 and 3 showed that lower levels of anxiety, lower levels of depression and a higher QoL are significantly associated with perceptions of more patient-centred care ($B = –0.22$, $–0.18$ and $0.25$, respectively). In Models 4–7, the analysis showed significant associations between the PCQ total scale and every FertiQoL subscale ($B = 0.148–0.239$), when adjusted for the aforementioned patient characteristics, indicating that better QoL in the Social, Emotional, Relational and Mind–Body domains is associated with a higher level of patient-centredness of care. The eighth model showed that higher scores on the FertiQoL total scale was significantly associated with higher levels of patient-centredness, when anxiety and depression were taking into account, suggesting that this is the most important variable of those three, when predicting patient-centredness of care. In four additional models, containing both HADS scales and each of the four FertiQoL subscales separately, it showed that the Social subscale added the most, when corrected for anxiety and depression ($B = 0.137; P = 0.001$).

Table II also lists the ICC’s, indicating that the variance in patient-centredness of participating clinics appeared to be 12–15%.

Finally, the 8–13% of the variance in patient-centredness described in this study was attributable to the patient’s level of QoL, anxiety and depression ($R^2$, last row).

**Discussion**

Patient-centredness of fertility care and patients’ well-being are related. Patients with a better QoL or lower levels of anxiety and depression report higher levels of patient-centred fertility care. However, as this is a cross-sectional study, associations could also be presented the other way around: more patient-centred care is related to a higher QoL and lower levels of anxiety and depression. We discuss both directions in more detail below.

First, we look into the association between patient-centredness and patients’ QoL. To the best of our knowledge, this has never been studied before in a fertility care setting. QoL involves a reflection of patients’ functioning in relation to their health status in a broad sense (Aarts et al., 2011) and links merely to a holistic view on care. Between 8 and 13% of the variance in patients’ experiences could be explained by their perceived QoL, indicating that these two concepts are related but distinct as also shown by the relatively weak correlation between the total PCQ and total FertiQoL ($B = 0.250$).

However, our results might point at the importance of integrating QoL aspects into care delivery and paying attention to anxiety and depression symptoms to improve patient-centredness and quality of care. For instance, when adjusted for patient characteristics, the Social subscale of the FertiQoL appeared to be related the most to patient-centredness of care. This might imply that patients without social support from family rely more heavily on the support provided at the fertility clinic. There are some studies supporting this hypothesis: less family problems were encountered and less psychosocial support was needed when patients’ satisfaction with care was high (Herman, 1997; Trute et al., 2008). These findings stress the importance of a comprehensive approach when providing care to patients experiencing infertility. This can also be underlined by our findings that only 12–15% of the variance

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**Table I: Total scores and subscale scores of all three measurement instruments ($n = 427$).**

<table>
<thead>
<tr>
<th>PCQ-infertility (range 0–3)</th>
<th>Mean (SD)</th>
<th>FertiQoL (range 1–100)</th>
<th>Mean (SD)</th>
<th>HADS (range 0–21)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.2 (0.4)</td>
<td>Total</td>
<td>70.8 (13.9)</td>
<td>Anxiety</td>
<td>5.6 (3.9)</td>
</tr>
<tr>
<td>Accessibility</td>
<td>2.1 (0.8)</td>
<td>Emotional</td>
<td>59.8 (18.7)</td>
<td>Depression</td>
<td>3.5 (3.3)</td>
</tr>
<tr>
<td>Information</td>
<td>2.0 (0.6)</td>
<td>Mind–Body</td>
<td>70.8 (19.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>2.5 (0.5)</td>
<td>Relational</td>
<td>78.2 (14.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respect for patients’ value</td>
<td>2.1 (0.8)</td>
<td>Social</td>
<td>74.0 (16.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient involvement</td>
<td>2.4 (0.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity and transition</td>
<td>2.0 (0.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>2.5 (0.4)</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

PCQ-infertility, patient-centredness questionnaire-infertility; SD, standard deviation; HADS, Hospital Anxiety and Depression Scale.
Table II  Multilevel regression analyses; associations between patient centredness and QoL, anxiety and depression.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Intercept (95% CI)</th>
<th>FertiQoL total</th>
<th>HADS anxiety</th>
<th>HADS depression</th>
<th>FertiQoL Emotional</th>
<th>FertiQoL Mind–Body</th>
<th>FertiQoL Relational</th>
<th>FertiQoL Social</th>
<th>FertiQoL total and HADS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>(null)</td>
<td>-0.16 (-0.36 to -0.03)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.24* (-0.44 to -0.03)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.25* (-0.45 to -0.06)</td>
<td>-25.44* (14.44–36.34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(FertiQoL total)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.36 to -0.05</td>
<td>0.25* (0.16–0.34)</td>
<td>-0.22* (-0.30 to -0.13)</td>
<td>-0.18* (-0.27 to -0.10)</td>
<td>0.18* (0.09–0.27)</td>
<td>0.22* (0.13–0.30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(HADS anxiety)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.45 to -0.04</td>
<td>-0.24* (-0.44 to -0.03)</td>
<td>-0.45 to -0.05</td>
<td>-0.45 to -0.05</td>
<td>-0.45 to -0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>(HADS depression)</td>
<td>-0.25* (-0.44 to -0.03)</td>
<td>-0.04 to -0.03</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(FertiQoL Emotional)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.04 to -0.04</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
<td></td>
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<tr>
<td>5</td>
<td>(FertiQoL Mind–Body)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>(FertiQoL Relational)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.04 to -0.04</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
<td>-0.04 to -0.04</td>
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<tr>
<td>7</td>
<td>(FertiQoL Social)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>(FertiQoL total and HADS)</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.25* (-0.45 to -0.05)</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
<td>-0.05 to -0.05</td>
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</table>

Coefficients (B) with 95% confidence intervals are demonstrated here. This coefficient describes the difference in PCQ when FertiQoL or HADS levels increase with 1. It also indicates the directions of the mentioned association. For example, the PCQ infertility is positively related to the FertiQoL total (B = 0.25), but the HADS anxiety is negatively related to the PCQ-infertility (B = -0.22). ICC, intra-cluster correlation coefficient; variance at hospital level/total variance. This represents the amount of variance in patient-centredness attributed to differences between hospitals. \( R^2 \), explained variance; this represents the percentage of variance in the clinics level of patient-centredness attributable to patient’s QoL, anxiety and depression.

\( ^* P < 0.05 \)
in patient-centredness was attributable to differences between the participating fertility clinics. Apparently, more than 80% of the variance in patient-centredness is attributable to other elements, which emphasizes the comprehensiveness of this concept.

Another more practical implication to these results involves the question of whether we should adjust fertility clinic’s patient-centredness levels for QoL and distress when reporting. In literature, it is not always recommended to do so, as adjustment has a small effect on hospital comparisons mostly (Hargraves et al., 2001; Damman et al., 2009; Mourad et al., 2010). However, if comparisons on PCQ involve groups known to differ on QoL and/or anxiety and depression, then adjustment for these variables will be required.

Second, interpretation of the association the other way around (i.e. more patient-centred care is related to a higher QoL and lower levels of anxiety and depression) suggests that a holistic approach to care, including patient-centred care, could potentially reduce short-term effects of treatment on concentration and interference with day-to-day activities (items in Mind–Body domain) or feelings of isolation (items in Social domain). In other health-care areas, researchers showed the beneficial effect of patient-centred care on several clinical, psychological and even economical outcome measures (Beach et al., 2006; Radwin et al., 2009; Vogel et al., 2009; Epstein et al., 2010), for instance, improved well-being and reduced costs (Stewart et al., 2000; Epstein et al., 2010). Within a fertility care setting, it would be valuable to investigate if more patient-centred care would lead to lower drop-out from treatment rates, which are often substantial (Roest et al., 1998; Smeenk et al., 2004; Brandes et al., 2009; Van Dongen et al., 2010).

By tailoring care more specifically to the individual patient and taking into account the patient’s wishes and needs, we might take away some of the emotional burden of infertility and accompanying treatments (Verhaak et al., 2007; Verberg et al., 2008; Van Empel et al., 2010a).

The results of this study are in line with previous studies on the relationship between patients’ evaluations of care and their mental health status in fertility care in terms of anxiety and depression (Sabouni et al., 1991; Mourad et al., 2010). Also in other health-care areas (e.g. medical psychology), researchers described interactions between affect and the ability of patients to evaluate different situations in care. Affective states play an important role in people’s interpersonal behaviours and ability to disclose personal information (Forgas, 2011; Bradley et al., 1995). On the one hand, this takes place by priming access to only mood-consistent information in memory (e.g. happy mood primes access to happy memories). On the other hand, this occurs by influencing the kind of processing strategies people use: patients suffering from a sad mood are more influenced by external social norms and behaviour of, for example, their partner. This results in a more cautious and reciprocal disclosure of personal information (Forgas, 2011). For fertility care, this could mean that more anxious and depressive patients might remember more bad experiences with care, underpinning our results, and will also be more cautious in sharing their experiences with care providers (Herbert et al., 2010). One important difference between previous studies and ours should also be noted: the PCQ-infertility is a validated measurement instrument assessing experiences with care instead of satisfaction (Van Empel et al., 2010a). Patients’ experiences are believed to map the quality of care from a patient’s perspective more accurately (Elwyn et al., 2000; Delnoij, 2009).

This study has several strengths. First, the large, randomly sampled and diverse study population, together with the high response rate (74%), ensures the representativeness of the Dutch population experiencing infertility. Second, we conducted a multilevel regression analysis. The clustered nature of our data on patients’ experiences makes multilevel analysis the preferred method for identifying determinants (Damman et al., 2009).

Some potential weaknesses are also worth considering. First, due to the cross-sectional study design, we cannot draw any conclusions on causality. To evaluate the actual effect that patients’ QoL has on the level of patient-centredness would be an interesting subject for future prospective research. Second, the PCQ was filled out by the patient couple, whereas the FertiQoL and HADS were completed by the woman only. This discrepancy has to be taken into account when interpreting our results. Several authors reported that men feel marginalized and overlooked in fertility care (Schanz et al., 2005; Malik and Coulson, 2008), although their QoL is mostly higher than that of women (Peterson et al., 2009; Chachamovich et al., 2010; Klemetti et al., 2010). The present study was nested in another, because we wanted to reduce the burden for couples of filling out such an amount of questionnaires. However, for future research, it is desirable to include men as well, as knowledge on men’s care experiences are also needed to design and develop interventions to improve fertility care services. Third, in this study, we adjusted our results for two patient characteristics, known to be associated with patient-centred fertility care. It would have been valuable if we had also included organizational determinants into the multilevel model, as previous research showed that patients’ experiences with care are associated with clinic factors (Mourad et al., 2010; Van Empel et al., 2010b). For instance, providing patients support from a nurse specializing in infertility or granting patients access to their own medical records is a proven practical way of improving patient-centredness of fertility care services (Van Empel et al., 2010b). The interaction between these types of possible determinants and patients’ well-being could therefore provide us with valuable information on how to improve our fertility care services. However, these organizational aspects were not available in the present study.

Conclusion

Associations exist between the level of patient-centredness in fertility care, and patients’ QoL and their levels of anxiety and depression. This reflects that paying attention to these patient-related variables and more tailored care could lead to positive well-being and care experiences and improved patient-centredness of care.

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Authors’ roles

J.W.M.A. designed the study, developed and managed the main database, interpreted the analysis and drafted the paper. A.G.H. analysed and interpreted the data and drafted the paper. I.W.H.E., J.A.M.K., J.B. and C.M.V. contributed to interpretation of data and revised critically
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for important intellectual content. I.W.H.E. also contributed to data collection and management. W.L.N. designed the study, interpreted the data and drafted the article. All authors gave final approval of the version to be published.

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**Conflict of interest**

None declared.

**References**


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