

# Perceived Patient-Centered Infertility Care and Interest in Less Invasive Treatment Options: A Cross-Sectional Study

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## Abstract

**Background:** Infertility is a significant medical and psychosocial burden for couples. Patient-centred care (PCC) promotes informed decision-making by integrating patients' values and preferences. Within this approach, it is important to provide information about all therapeutic options, including less invasive treatments such as Restorative Reproductive Medicine (RRM).

**Aim:** To assess perceived patient-centred infertility care among couples undergoing treatment at the University Hospital Sveti Duh in Zagreb, and to examine the importance they attribute to being offered less invasive treatment options before medically assisted reproduction (MAR).

**Methods:** This cross-sectional study was conducted between January and April 2022 at the University Hospital Sveti Duh in Zagreb. The survey combined sociodemographic questions with selected items from the Patient-Centredness Questionnaire - Infertility (PCQ-I). The study included couples undergoing infertility treatment during the study period.

**Results:** A total of 101 couples participated in the study. Care was generally perceived as mostly or fully patient-centered. No significant link was found between being offered less invasive methods and overall satisfaction ( $p=0.34$ ). However, respondents interested in less invasive treatments rated the domain of respect for patients' values and needs significantly lower compared to those not interested (median 2.3 vs 2.7;  $p=0.007$ ). Married women reported significantly lower satisfaction than unmarried women in several PCC domains, including communication (median 2.42 vs 2.83;  $p=0.007$ ) and overall patient-centeredness (median 2.49 vs 2.85;  $p<0.001$ ).

**Conclusion:** While infertility care at the University Hospital Sveti Duh has been largely perceived as patient-centred, less invasive and restorative reproductive options remain insufficiently offered and integrated. Greater awareness and availability of restorative and fertility-awareness-based approaches may help strengthen shared decision-making and better align infertility care with patient-centred principles.

**Keywords:** infertility, patient-centred care, restorative reproductive medicine, medically assisted reproduction, patient satisfactions

## Introduction

Infertility affects around one in six couples globally and has multifactorial medical, emotional, and social implications (1). The causes of infertility are numerous and not fully defined, and some are diagnosed using controversial diagnostic methods (2). The approach to infertility treatment generally does not involve physiologically based fertility awareness methods (FABM) despite their proven benefits in improving pregnancy rates, providing more comprehensive diagnostic evaluation, and less invasive targeted treatment, therefore leaving the medical approach to couples incomplete (3, 4). FABMs are evidence-based methods that are used to track, monitor, and interpret daily physical signs of the female menstrual cycle, such as cervical mucus monitoring, basal body temperature measurement, and urinary hormone monitoring. Despite the broad range of diagnostic and therapeutic options, the clinical approach often defaults to medically assisted reproduction (MAR), while physiological and less invasive approaches remain underutilized. It has been shown that in certain circumstances, such as in cases of polycystic ovary syndrome and in idiopathic (unexplained) infertility, MAR procedures are not more effective than waiting for natural conception (5, 6). The risk of overtreatment, complications, and financial costs of MAR should not be neglected (7).

The patient-centred care (PCC) model shifts the focus of healthcare from procedure-centred to person-centred care. It emphasizes respect for individual's values, active patient participation, and transparent communication (8). In infertility treatment, integrating PCC enhances trust, compliance, and overall satisfaction with care (9, 10).

Restorative Reproductive Medicine (RRM) represents a clinically effective, physiologically based approach that identifies and treats underlying causes of infertility. RRM is based on monitoring the female fertility cycle and describes infertility as a consequence of multiple chronic health conditions that could be properly recognized and treated,

resulting in fertility restoration. RRM includes cervical mucus monitoring, mild ovulation induction, ultrasound assessment of the menstrual cycle, timed intercourse, and monitoring of hormonal changes with different supplementation. Few studies have shown comparable or superior outcomes to MAR, with lower rates of complications and multiple pregnancies with significant cost savings (11-13). However, RRM is rarely offered as a standard option in Croatia, limiting couples' ability to make informed choices consistent with their values.

This study aimed to assess how patient-centred care is perceived among couples undergoing infertility treatment at the University Hospital Sveti Duh in Zagreb and to evaluate their attitudes toward receiving less invasive treatment options before MAR.

## Materials and methods

### *Study design*

This was an observational cross-sectional study.

### *Ethics*

The study was conducted in alignment with the institutional Codes of Ethics. The research protocol was reviewed and approved by the Ethics Committee of the University Hospital Sveti Duh, Zagreb, Croatia (Approval No. 012-6791). All participants provided informed consent before participation in the study.

### *Participants*

The study included couples diagnosed with infertility, defined as the failure to achieve a clinical pregnancy after 12 months of regular, unprotected intercourse, or after six months if the female partner was older than 35 years. Participants were recruited among couples undergoing infertility treatment at the University Hospital Sveti Duh in Zagreb. Couples with a history of recurrent spontaneous miscarriages, as well as those who had achieved pregnancy following previous fertility treatment, were also included.

Couples were eligible for inclusion if they had been trying to conceive for one year or less, if the female partner was over 40 years of age, or if they had a history of recurrent spontaneous miscarriages.

#### *Data collection and study tools*

The study was conducted between January and April 2022 at the University Hospital Sveti Duh in Zagreb. After providing written informed consent, participants completed the questionnaire while waiting for their appointment. One member of each couple completed the questionnaire on behalf of the couple, providing a single response per couple.

The questionnaire consisted of two parts: a demographic and clinical section, and a subset of items from the Patient-Centredness Questionnaire – Infertility (PCQ-I), assessing the domains of information, communication, patient involvement, and respect for patient values (10). Although the PCQ-I has demonstrated reliability across seven domains of patient-centred care—accessibility, information, communication, patient involvement, respect for patient values, continuity and transition, and competence (10)—this study focused on selected domains relevant to patients' familiarity with treatment options and their decision-making processes. Additional questions explored respondents' views on less invasive treatment approaches, such as restorative reproductive medicine (RRM), before medically assisted reproduction (MAR).

#### *Statistical analysis*

Descriptive statistics and inferential analysis were performed to explore relationships between perceptions of PCC and socio-demographic or clinical variables. The normality of distribution for continuous variables was tested using the Shapiro-Wilk test. Continuous data were described using the median and interquartile range (IQR) boundaries. Differences in continuous variables between two independent groups were tested with the Mann-Whitney U test (with the corresponding difference and 95% confidence interval). Differences between groups were assessed using the Kruskal-

Wallis test. When significant differences were found, pairwise comparisons were performed using Conover's post hoc test with Bonferroni correction. The internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient, which was 0.898. All p-values were two-tailed, and the significance level was set at  $\alpha=0.05$ . Statistical analysis was performed using MedCalc® Statistical Software version 23.2.1 (MedCalc Software Ltd., Ostend, Belgium; <https://www.medcalc.org>; 2025).

## **Results**

Slightly more than half of respondents (52.5%) evaluated their infertility care as predominantly or fully patient-centred. No statistically significant association was found between the importance attributed to being offered less invasive treatments and overall PCC scores ( $P=0.35$ ). However, a significant difference was observed in the domain of respect for patients' values and needs.

The highest-rated domain was information provision, indicating that medical staff offered clear and satisfactory explanations regarding treatment. In contrast, the lowest-rated domains were communication and patient involvement, indicating potential areas for improvement in shared decision-making in the process of infertility treatment.

The results showed a significant difference in the domain of respect for patients' values and needs according to respondents' views on less invasive treatment options. Participants who considered it important to be offered less invasive treatments before MAR rated this domain significantly lower compared with those who reported that this was not important (Table 1). Differences in perceived PCC were also observed according to marital status. Unmarried women reported higher overall PCC scores than married women. Specifically, married women rated the domains of information, communication, and respect for patients' values and needs significantly lower than unmarried women (Table 2).

**Table 1.** Comparison of patient-centred care domains according to participants' attitudes toward less invasive infertility treatment methods

Domain	Yes	No	Not important	P*
Information	3.0 (1-3)	3.0 (3-3)	3.0 (3-3)	0.26
Communication	2.4 (1.7-2.8)	2.8 (2.3-3.0)	2.7 (2.4-3.0)	0.07
Involvement in own treatment	2.3 (2-2.7)	2.7 (2-3)	2.3 (2.2-3)	0.43
Respect for patients' values and needs	2.3 (1.9-2.8)	2.7 (2.5-3)	2.7 (2.4-3)	0.007†
Overall patient-centredness	2.5 (1.7-2.9)	2.7 (2.2-3)	2.7 (2.4-2.9)	0.34

Values are reported as median (interquartile range).

\* Kruskal-Wallis test (with Conover post hoc test)

† Significant at P < 0.05

**Table 2.** Comparison of patient-centred care domains according to marital status

Domain	Yes	No	Not important	P*
Information	2.0 (1-3)	3.0 (3-3)	1.0	0.02†
Communication	2.42 (2.0-2.9)	2.83 (2.58-3.0)	0.29	0.007†
Involvement in own treatment	2.33 (2.0-2.7)	2.67 (2.33-3.0)	0.30	0.05
Respect for patients' values and needs	2.43 (2.14-2.86)	2.71 (2.57-3.0)	0.29	0.01†
Overall patient-centredness	2.49 (1.93-2.84)	2.85 (2.63-2.98)	0.37	<0.001†

\* Mann-Whitney U test

† Significant at P < 0.05

## Discussion

The findings of this study indicate that infertility care at the University Hospital Sveti Duh is generally perceived as patient-centred. However, several dimensions of care—particularly communication and patient involvement—appear to be less developed. While participants rated the domain of providing information about treatment highly, lower scores in the domains of communication and respect for patients' values and needs suggest opportunities to strengthen shared decision-making during infertility diagnosis and treatment.

Although no significant differences were observed in overall PCC scores according to the importance of introducing less invasive procedures such as RRM before MAR, participants who considered it important to be offered such options rated the domain of respect for patients' values and needs significantly lower compared with those who reported that this was not important. This finding suggests that limited awareness and availability of less invasive, restorative

approaches may affect patients' perceptions of whether their values and preferences are adequately acknowledged during infertility care. Restorative reproductive medicine methods are considered less invasive since they do not include follicle aspiration or egg retrieval, in vitro fertilisation, and embryo cultivation or transfers. Unfortunately, conventional medical education and professional guidelines rarely include RRM, limiting both physician familiarity and patient access (13).

Other studies have shown that clinicians often underestimate the importance of some elements of patient care and tend to assume that their only goal is to achieve pregnancy (14, 15). Couples often have additional expectations from health providers, such as a better understanding of fertility issues, improvement of overall health, and maintaining a close relationship with their partner (14). Therefore, the physicians should familiarize themselves with patients' preferences, respecting their values and preferences. Encouraging the patient to talk about their attitudes is an important step for

the implementation of patient-centred care and for the shared decision-making process, since it was shown that this could be the most neglected dimension of care in the treatment of infertility (15).

Our study has also shown that women who are not married had a better experience of overall medical care. In contrast, married women tended to rate the domains of information, communication, and respect for patients' values and needs lower (Table 2). These lower scores among married women suggest possible differences in their expectations or experiences regarding communication and respect for patient values during treatment.

This study used the PCQ-I questionnaire, which has been previously used in several countries (the Netherlands, Slovakia, Slovenia, Portugal, Iran, and New Zealand) (10, 16-19). These international studies have shown that patients have similar opinions on PCC care, feeling insufficiently involved in decisions and inadequately informed about alternatives (16-19). Introducing RRM as a systematic option could address these needs while aligning care with PCC ethics and bioethical principles of beneficence, autonomy, and non-maleficence.

#### Strengths and limitations of the study

This study has several strengths. It provides one of the first insights into patients' perceptions of patient-centred infertility care in Croatia using elements of the PCQ-I instrument. In addition, the study explores the perceived importance of less invasive treatment options within infertility care, a topic that has received limited attention in the regional literature.

However, several limitations should be considered. The cross-sectional design does not allow conclusions about causal relationships between perceptions of patient-centred care and views on less invasive treatment options. The study was conducted in a single tertiary care institution with a relatively modest sample size, which may limit the generalizability of the findings to other healthcare settings. Furthermore, only selected domains of the PCQ-I questionnaire were used rather than the full validated

instrument, which may have restricted the comprehensiveness of the assessment of patient-centred infertility care. Finally, the results are based on self-reported perceptions of care, which may be influenced by subjective expectations or response bias.

Future research should employ the full version of the PCQ-I questionnaire on larger samples and across multiple healthcare institutions in Croatia to provide a more comprehensive assessment of patient-centred infertility care. During the preparation of this study, a simplified version of the PCQ-I was also developed, which may facilitate easier data collection and statistical analysis in future research (16). Furthermore, administering the PCQ-I after integrating restorative approaches such as Restorative Reproductive Medicine (RRM) into infertility treatment programs could help evaluate how fertility education and cycle monitoring contribute to a more holistic, individualized, and patient-centred model of care.

Overall, the findings highlight the importance of strengthening patient-centred infertility care through improved communication, respect for patients' values, and greater involvement of couples in treatment decisions.

## Conclusion

Restorative and fertility-awareness-based methods represent less invasive approaches that align with the principles of patient-centred care. However, their limited inclusion in education and clinical practice may limit couples' access to comprehensive information about available treatment options.

Strengthening professional training and systematically integrating restorative approaches such as RRM into fertility care pathways may help broaden treatment choices and support respect for patients' values and informed decision-making.

## Declarations

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Grgić's Master of Nursing thesis, which was written and defended in the Croatian language. The thesis is available in the online repository: <https://urn.nsk.hr/urn:nbn:hr:224:094678>

**Authors contributions:** Study conception and design: KG and ATL; Data collection: KG; Interpretation of results: KG, ATL and LL; Draft manuscript preparation: ATL and IM. All authors critically reviewed and approved the final version of the manuscript.

**Ethics considerations:** The approval of the Ethics Committee of the University Hospital Sveti Duh, Zagreb, was obtained (Approval No. 012-6791). All participants provided informed consent before participation in the study.

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