



Routine psychosocial care in infertility and medically assisted reproduction – A guide for fertility staff

ESHRE Psychology and Counselling Guideline Development Group

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I. INTRODUCTION AND SCOPE OF THE GUIDELINE

This document offers evidence-based best practice advice to all fertility clinic staff (doctors, nurses, midwives, counsellors, social workers, psychologists, embryologists, and administrative personnel) on how to incorporate psychosocial care in routine infertility care. Psychosocial care is defined as care that enables couples, their families, and their healthcare providers to optimize fertility care and manage the psychological and social implications of infertility and its treatment (*Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs, 2008*).

Why was this guideline produced?

The World Health Organization defines health as a ‘state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’ (*World Health Organization, 2007*). This definition highlights the many dimensions (anatomical, physiological, and mental) of health and the importance of providing adequate care to address them all and not only to treat the disease.

In infertility care, this is especially important for several reasons. First, standard fertility treatment does not cure the cause of infertility but only assists patients in achieving parenthood. Therefore, most individuals may still have to manage the psychosocial consequences of infertility in their lives, for instance, if they decide to have more children. Second, it is now well established that many infertile patients find it difficult to manage the typically lengthy diagnostic and treatment period and the uncertainty of achieving parenthood (*Klonoff-Cohen, et al., 2007; Boivin and Lancaster, 2010*). Most patients experience some degree of emotional distress during treatment (*Verhaak, et al., 2007a; Knoll, et al., 2009; Karatas, et al., 2011*) and around 23% discontinue prematurely because of the perceived burden of treatment (*Brandes, et al., 2009*). Finally, about one-third of patients will end treatment without achieving pregnancy or live birth (*Pinborg, et al., 2009*) and many experience difficulties adjusting to their unmet parenthood goals (*Verhaak, et al., 2007c; Johansson, et al., 2010; Wischmann, et al., 2012*). Even when a pregnancy is achieved, it is experienced with increased anxiety about the viability and health of the foetus (*Hammarberg, et al., 2008*). Providing high-quality fertility health care implies not only creating the optimal treatment conditions for patients to achieve parenthood but also supporting patients and healthcare providers in managing these and other implications of infertility and its treatment. Only by doing so can we ensure a healthy experience of fertility treatment.

The present guidelines propose an approach to psychosocial care that differentiates between three complementary levels of psychosocial care: routine psychosocial care; infertility counselling (e.g. crisis intervention, grieving support, implications counselling); and psychotherapy (for patients with diagnosed mental health disorders). These latter two are considered specialized psychosocial care. It is now consensual that most patients identify a relatively common set of challenges to the treatment process, but only around 20% of them develop clinically significant problems that lead them to seek or warrant referral to specialized psychosocial care (infertility counselling or psychotherapy) (*Boivin, et al., 1999; Verhaak, et al., 2010*). By providing routine psychosocial care, clinics can address the common needs that most patients have. However, to be effective and impactful, this has to be provided in combination with medical care during routine practice in a way that makes it easily accessible for all patients. This implies that routine psychosocial care should be the responsibility of all staff members that have contact with patients (depending on how clinics organize their services, these

may or may not include mental health professionals). This approach is in line with the biopsychosocial and patient-centred models of care (e.g., [Engel, 1977](#); [Principles of patient-centred care., 2012](#)) and has been advocated and implemented across different health conditions([Jordans, et al., 2010](#); [Fann, et al., 2012](#); [Gameiro, et al., 2013a](#)).

Patients with specific needs, who are at risk of, or experiencing, emotional problems, should be referred (by a staff member or self-referral) to specialized psychosocial care, which is the sole responsibility of mental health professionals (e.g., specialist counsellors, social workers, psychologists, psychiatrists, psychotherapists). Therefore, the guideline assumes that all clinics should offer their patients the opportunity to access infertility counselling or psychotherapy when needed (either via referral by a staff-member or self-referral) and should include recommendations to that effect. However, infertility counselling and psychotherapy are not the focus of the guideline.

The evidence presented in this guideline shows that providing routine psychosocial care can reduce stress ([Pook and Krause, 2005](#)) and concerns about medical procedures ([Gameiro, et al., 2013a](#)) and improve lifestyle outcomes ([Moran, et al., 2011](#)), knowledge([Hope and Rombauts, 2010](#)), patient well-being ([Cousineau, et al., 2008](#); [Aarts, et al., 2012](#)), and compliance with treatment ([Pook and Krause, 2005](#)). Additional benefits can be expected because patients' well-being is associated with their satisfaction with care ([Boivin, et al., 2011](#); [Aarts, et al., 2012](#); [Pedro, et al., 2013](#)). Moreover, if full compliance with treatment can be achieved, a 15% increase in pregnancy rates at fertility clinics can be expected ([Gameiro, et al., 2013c](#)).

This ESHRE Guideline was developed to guide fertility clinic staff in incorporating routine psychosocial care in the infertility care they deliver to their patients. All recommendations are based on the best available evidence.

Target users of the guideline

The current guideline provides guidance to all fertility clinic staff (doctors, nurses, midwives, counsellors, social workers, psychologists, embryologists, and administrative personnel) that have contact with patients and can deliver routine psychosocial care and/or make referrals to specialist psychosocial care services (i.e., infertility counselling or psychotherapy).

Although most aspects of psychosocial care are common to all patients attending fertility clinics, there are some aspects that will be relevant to specific patients, according to their idiosyncratic vulnerabilities and needs, or to address the specific challenges that different stages of treatment impose on patients. This variability in needs across patients and treatment stages suggests that different members of staff will be responsible for specific aspects of the psychosocial care provided. It is not the role of this guideline to assign such responsibilities because these will depend largely on socio-cultural and legal differences across European countries and on the way care is organized at each fertility clinic.

Despite these socio-cultural and legal differences, the ESHRE Guideline aims to set a minimum quality standard for the provision of routine psychosocial care and to contribute to the homogenization of psychosocial care in infertility care across all European countries.

Scope of the guideline

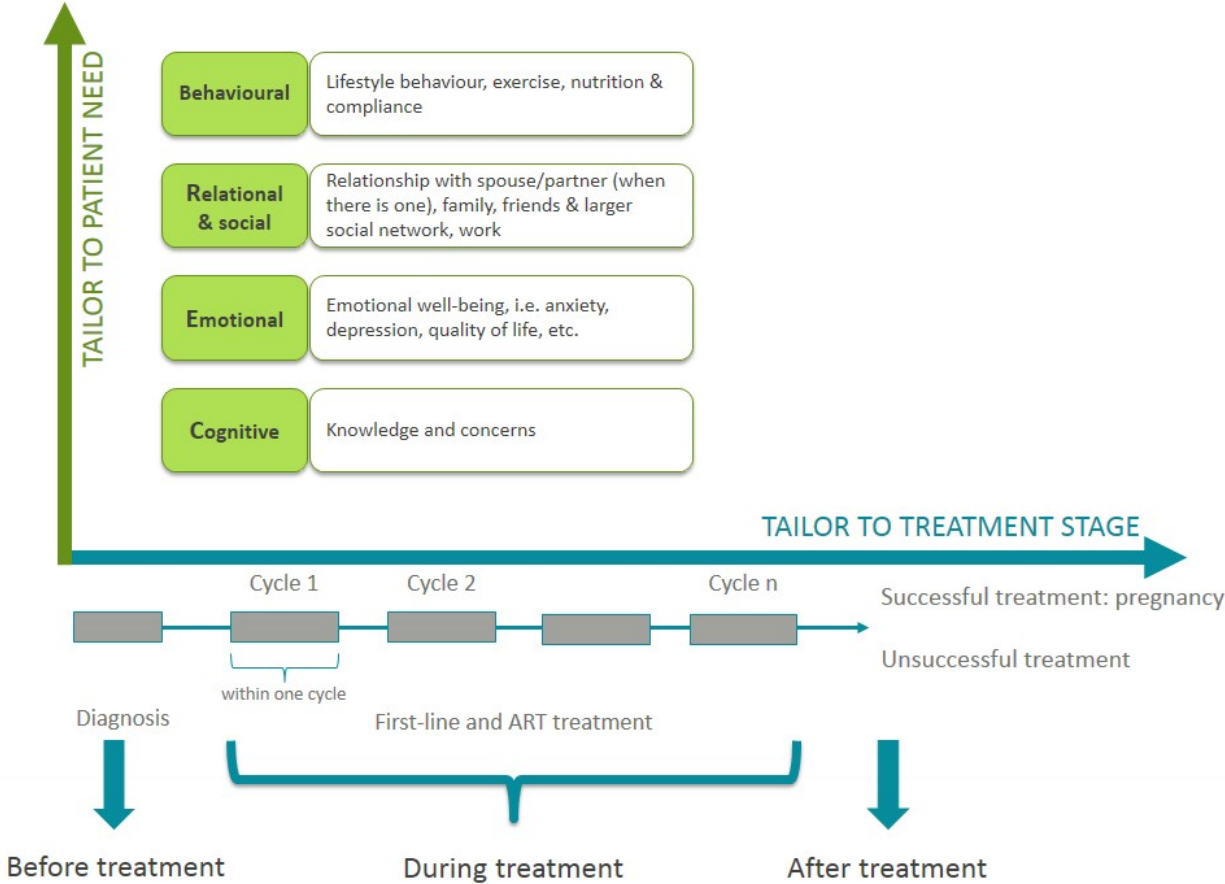
This document ‘Routine psychosocial care in infertility and medically assisted reproduction – A guide for fertility staff’ was written to provide guidance about two main issues.

First, information is provided to fertility staff about preferences of patients regarding the psychosocial care they receive at clinics and how this care is associated with their well-being. This information is considered useful to raise staff awareness about patient preferences for psychosocial care.

Second, the guideline provides information about the psychosocial needs that patients experience across their treatment pathway, and how fertility clinic staff can detect and address these needs.

The guideline is organized according to a horizontal ‘time’ axis and a vertical ‘needs’ axis, with the aim of tailoring care to the different psychosocial needs patients experience across the different treatment stages. This approach is depicted in Figure I.1.

Figure I.1. Schematic representation of the guideline approach for the provision of psychosocial care tailored to specific treatment stages and patient needs.



Three different treatment stages were considered, each encompassing different time points or periods.

The ‘pre-treatment’ period refers to the period that begins at the first visit to the clinic up to the start of the first treatment cycle. The ‘during treatment’ period refers to time that encompasses any

treatment cycle, being it either first-line treatment such as **intrauterine insemination (IUI)**, or assisted reproductive technology (ART) cycles. **Finally, the ‘after treatment’** period refers to the period starting 1 year after patients undergo their last treatment cycle. The existing literature on the after treatment period differentiates between people who did not conceive with treatment (i.e., unsuccessful treatment) and people who did (i.e., successful treatment that results in live birth) and this distinction is retained in the current guideline. Although fertility staff members do not have contact with patients once they finish treatment, preventive care measures can be considered for implementation during and at the end of treatment, which may address the needs patients experience after treatment. In addition, self-administered interventions can be developed and made available for patients, for instance at the clinics’ websites.

‘Needs’ refer to conditions assumed necessary for patients to have a psychosocially healthy experience of the fertility treatment. To capture the World Health Organization (WHO) multidimensional definition of health, the psychosocial needs of patients were classified according to four different categories: behavioural, relational and social, emotional, and cognitive, labelled as the **BREC** needs.

The guideline provides information about the needs patients experience at each treatment stage and about how to detect and address them. This is depicted in Figure I.2.

Figure I.2. Describing, detecting, and addressing patient needs.



The description of the different types of needs (behavioural, relational and social, emotional and cognitive) across different treatment stages (before, during, and after treatment) captures group variability and ensures that staff are aware of the most common needs patients experience. Implementing routine procedures to address these needs should maximize the impact of psychosocial care for patients.

However, the guideline also considers that patients may vary greatly in the types and level of needs they have. To capture this individual variability regarding needs, the guideline informs about risk factors (correlates and predictors) for specific psychosocial needs and about existing infertility-specific and valid tools to detect them. Risk factors point to a patient risk profile and tools are useful for clinical assessment and screening.

Fertility staff also have to be sufficiently knowledgeable about the available psychosocial care to efficiently address patients’ needs and be able to deliver them. Thus, the guideline informs about psychosocial care components that do not require the active intervention of mental health professionals (e.g., specialist counsellors, psychologists, psychiatrists) or can be delivered by any member of staff without specialized training in mental health care, in the context of their routine tasks.

For instance, medical doctors usually provide information about treatment to patients and can use validated interventions. Administrative personnel usually deal with bureaucratic issues and can use the tools described in Appendix 2 for service user evaluation. Interventions that can only be delivered by mental health professionals (e.g., infertility counselling, individual/couple psychological therapy, sex therapy) were not considered. These may be described in future ESHRE Guidelines. Two important clarifications need to be made regarding the above definitions. First, the fact that psychosocial care components do not require the active intervention of a mental health professional does not mean that they cannot deliver them. This will depend on how psychosocial care is organized at clinics. What is considered is whether any member of staff is able to deliver them, independently of if they have or have not specialized training in mental health care. This is defined as Master's or PhD programmes or other long-term specialized training programmes. Second, the guideline development group (GDG) advocates that, because of their specialized expertise, mental health professionals should be involved in the design, development, and dissemination of all psychosocial care components to be delivered at fertility clinics.

Psychosocial needs can be affected by fertility treatment but can also affect the treatment outcome. The guideline is concerned with how treatment affects needs, and does not focus on how meeting patient needs impacts on treatment success rates. The GDG did not consider this critical for the aim of the guideline for multiple reasons. First, there is enough evidence that patients experience subclinical and clinical psychosocial problems during treatment ([Verhaak, et al., 2007a](#); [Knoll, et al., 2009](#); [Karatat, et al., 2011](#)) to warrant that these needs be addressed, even if they do not impact on the treatment outcome. Second, patients themselves express a desire to see these needs addressed ([Dancet, et al., 2010](#)). Third, although the evidence relating patients' psychosocial needs (in particular psychological distress) to treatment outcome is complex and even controversial, it is sufficiently compelling in showing that at least an indirect link exists, via premature discontinuation behaviour. Indeed, in retrospect patients refer to specific needs not being met as important reasons for having discontinued treatment prematurely ([Gameiro, et al., 2012](#)) and discontinuation results in lower success rates for patients and clinics ([Gameiro, et al., 2013c](#)).

Similarities and differences with previous guideline

The current guideline development was initiated by members of the 1999 guideline development group, supplemented with advice from additional experts in the field. However, whereas the previous guideline was developed to assist mental health professionals in providing counselling and psychotherapy to infertile patients ([Boivin, et al., 2001](#)), the present one focuses on guiding all fertility clinic staff in the provision of routine psychosocial care. For instance, the present guideline only includes psychosocial interventions that can be delivered without the presence of a mental health professional and do not require specialized training.

The exclusive focus on routine psychosocial care is justified by the current imbalance in available guidance about how to provide it, compared with infertility counselling and psychotherapy. Indeed, there is now plentiful evidence-based guidance for mental health professionals working with infertile patients, in either book format, peer-review manuscripts, or specialized training courses. The same cannot be said about supporting fertility staff in providing routine psychosocial care. Recent evidence suggests that fertility staff lack precise knowledge about how to address their patients' concerns, needs, and preferences ([Huppelschoten, et al., 2013](#)), find it hard to assess their performance in doing so ([Aarts, et al., 2011](#)), and believe they need detailed and clear guidance to improve their practice

(Huppelschoten, *et al.*, 2013). The reasons for this lack of guidance are mainly historical as, until very recently with the emergence of the Patient-Centred Care movement (van Empel, *et al.*, 2008) and specific fertility care models such as the Integrated Model for Fertility Care (Boivin, *et al.*, 2012), psychosocial care was mainly considered to be the responsibility of mental health professionals.

Another main difference between the two guidelines is that the current guideline is evidence-based. The methodology adopted in its development is based on the Manual for ESHRE Guideline Development (Nelen, 2009). The methodology is reported in detail in Appendix 6; it involves the systematic search and objective assessment of the best available evidence from January 1990 to April 2014, and an extensive and transparent review of the guideline by the relevant stakeholders.

Finally, whereas the previous guideline included sections regarding specific patient populations (e.g., patients using third-party reproduction, lesbian couples), the present guideline only focuses on those aspects of psychosocial care that are common to all infertile patients (individuals, couples). The only reason for limiting the guideline scope was to ensure feasibility while complying with the evidence-based approach recommended by the Manual for ESHRE Guideline Development. This necessary restriction in scope and to available evidence means that important topics (e.g., ethical issues, the welfare of the child, gamete donation, etc.) are not addressed. Future ESHRE Guidelines may be developed to address the specificities of providing psychosocial care to specific patient groups or regarding particular topics. However, the GDG would like to make it clear that these guidelines do apply for all patient populations and that they tried to be inclusive in the characterization of the common needs that patients experience. Therefore, we included all studies with specific groups (e.g., lesbian couples), as long as they focused on the aspects of care that all patients experience.

Interpretation of the grades of recommendations

For each recommendation, a grade (A-D) was assigned based on the strength of the supporting evidence (scored from 1++ to 4). In cases of the absence of evidence, the guideline development group (GDG) could decide on writing good practice points (GPP), based on clinical expertise (Nelen, 2009).

Grades of recommendations	Supporting evidence
A	Meta-analysis, systematic review or multiple randomized controlled trials (RCTs) (high quality)
B	Meta-analysis, systematic review or multiple RCTs (moderate quality) Single RCT, large non-randomized trial, case-control or cohort studies (high quality)
C	Single RCT, large non-randomized trial, case-control or cohort studies (moderate quality)
D	Non-analytical studies, case reports or case series (high or moderate quality)
GPP	Expert opinion

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II. SUMMARY

LIST OF ALL RECOMMENDATIONS

Psychosocial care in fertility clinics: patients' preferences

WHICH ASPECTS AND COMPONENTS OF PSYCHOSOCIAL CARE ARE IMPORTANT TO PATIENTS?

Staff characteristics

Fertility staff should be aware that patients value

- how staff relate to them.(A)
- staff showing understanding and paying attention to the emotional impact of infertility.(A)
- that both partners are involved in the treatment process.(A)
- being involved in decision-making.(A)
- receiving psychosocial care from sensitive and trustworthy staff members.(A)
- receiving attention to their distinct needs related to their medical history.(B)

Clinic characteristics

Fertility staff should be aware that patients value

- minimal waiting times, not being hurried in medical consultations, and continuity of care.(A)
- the professional competence of fertility staff and receiving personalized care.(A)
- the provision of opportunities for contact with other patients.(A)
- being in a clinic dedicated to infertility care.(A)
- the offer of specialized psychosocial care (infertility counselling or psychotherapy) before, during, and after IVF treatment.(B)

The guideline development group recommends fertility staff to be aware that

- patients expressing a need for emotional support value the offer of specialized psychosocial care (infertility counselling or psychotherapy).(GPP)
- patients may value the presence of a chaperone during medical examinations.(GPP)
- men value rooms designated for producing sperm samples.(GPP)

Psychosocial care components

Fertility staff should be aware that patients value

- written treatment-relevant information.(C)
- explanations about treatment results and treatment options.(C)
- understandable and customized (i.e., personally relevant) treatment information.(C)
- the provision of information about psychosocial care options (e.g., contact details of support groups, online support options, access to infertility counselling, or psychotherapy).(B)

Fertility staff should be aware that IVF patients equally prefer in-person or telephone consultation to discuss their treatment results and future plans.(C)

Psychosocial care in fertility clinics: patient well-being

WHICH CHARACTERISTICS OF FERTILITY STAFF AND CLINICS ARE ASSOCIATED WITH PATIENTS' WELL-BEING?

Staff and clinic characteristics

Fertility staff should be aware that

- receiving patient-centred care is associated with better patient well-being.(C)
- positive staff characteristics (communication, respect, competence, involvement, and information) are associated with better patient well-being.(C)
- positive clinic characteristics (information, competence of clinic and staff, and continuity) are associated with better patient well-being.(C)

WHICH INTERACTIVE AND SELF-ADMINISTERED INTERVENTIONS ARE ASSOCIATED WITH PATIENTS' WELL-BEING?

Interactive interventions

Fertility staff should be aware that offering the currently available interactive complex interventions* is not likely to affect patient individual and relational well-being.(B)

Self-administered interventions

Fertility staff should provide preparatory information about diagnostic procedures because it decreases infertility-specific anxiety and stress.(C)

Fertility staff should be aware that

- tailored online psycho-educational interventions may improve infertility-specific stress and self-efficacy, and the sexual and social concerns of particular groups of patients.(C)
- providing IVF patients with access to an internet-based personal health record is not likely to promote their emotional well-being (depression, anxiety, and self-efficacy).(C)

**Complex interventions integrate several psychosocial components (e.g., information provision, training in coping, or relaxation strategies) (Craig, et al., 2008).*

BEFORE TREATMENT

WHAT ARE THE NEEDS OF PATIENTS BEFORE TREATMENT?

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should be aware that

- one in 10 patients referred for fertility treatment chooses not to start treatment.(C)
- the reasons patients state for not starting any type of recommended fertility treatment are: rejection of treatment (due to ethical objections, concerns about and lack of interest in treatment), personal reasons, relational problems, financial issues, and psychological burden of treatment.(B)
- the reasons patients on the waiting list to start ART treatment state for not starting recommended ART treatment are: relational problems, psychological burden of treatment, personal reasons, clinic-related problems, and financial issues.(B)
- a considerable number of patients have lifestyle behaviours that may negatively affect their general and reproductive health.(C)

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that

- patients starting first-line or ART treatments do not have worse marital and sexual relationships than the general population.(B)
- patients in fertility workup do not present higher prevalence rates of sexual dysfunctions than the general population.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- before the start of IVF treatment, patients are not more depressed than the general population or matched controls.(B)
- evidence about whether before the start of a first IVF cycle patients are more anxious (state and trait anxiety) than the general population is inconsistent.(B)
- before first-line or ART treatment, women do not show more psychiatric disorders or general psychopathology than the general population.(C)

Cognitive needs

(knowledge and concerns)

-

- indicates the absence of recommendations for this aspect of psychosocial care.

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS BEFORE TREATMENT?

GENERAL RECOMMENDATION

The guideline development group recommends that fertility staff

- offer patients the opportunity to have their needs assessed and be informed about their emotional adjustment before the start of treatment.(GPP)
- use the tools listed in Appendix 2 when assessing patients' needs.(GPP)

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should

- be aware that currently there are no reliable pre-treatment tools or predictors to identify patients who are not likely to start recommended fertility treatment.(B)
- not assume that patients fully self-report on risk factors for reduced fertility (e.g., eating disorders).(C)
- be aware that risk factors (e.g., smoking, alcohol use, and diet) for reduced fertility can be assessed with self-administered online tools.(C)

The guideline development group recommends that fertility staff consider explicitly screening risk factors (e.g., drug use, eating disorders) for reduced fertility.(GPP)

Relational and social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that

- women experience higher social and sexual infertility-specific stress than men.(C)
- the ways patients deal with their fertility problems are associated with infertility-specific relational and social distress:
 - The use of meaning-based coping (e.g., thinking about the fertility problem in a positive light, finding other goals in life) seems to be associated with lower fertility-specific marital and social distress.
 - The use of avoidance coping strategies (e.g., avoiding being among pregnant women) seems to be associated with higher fertility-specific marital and social distress.(C)
- in couples, the way one partner reacts to the infertility condition/diagnosis is associated with how the other partner reacts.(C)
- couples who have different views on the importance of parenthood and social concerns may show lower relationship satisfaction than those who have similar views.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- women have higher levels of depression and infertility stress than men.(C)
- patients with a lower occupational status experience higher infertility stress and anxiety than patients with a medium or high occupational status.(C)
- women whose partner has male factor infertility experience higher anxiety than women with female factor, mixed, or unexplained infertility, whereas type of infertility diagnosis is not related to depression.(C)
- the way patients deal with their fertility problems is associated with their infertility distress:
 - The use of passive coping (e.g., rumination, withdrawal) seems to be associated with higher levels of infertility distress.
 - The use of active coping (e.g. goal-oriented problem-solving, thinking rationally about the problem) seems to be associated with lower infertility distress.(C)

Fertility staff should be aware that

- **individuals who perceive their partner to be available and responsive experience lower infertility stress than individuals who perceive their partner to be avoidant and non-responsive.(C)**
- **in couples, each partner's depressive symptoms are associated with their own and their partner's infertility-specific distress.(C)**
- **the SCREENIVF is an infertility-specific validated tool designed to be used before the start of treatment, to assess risk factors for emotional problems after a treatment cycle.(B)**

The guideline development group recommends that fertility staff use the SCREENIVF before the start of each treatment cycle to assess patients' risk factors for emotional problems after the cycle.(GPP)

Cognitive needs

(knowledge and concerns)

-

- indicates the absence of recommendations for this aspect of psychosocial care.

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS BEFORE TREATMENT?

GENERAL RECOMMENDATION

The guideline development group recommends that fertility staff refer patients at risk of experiencing clinically significant psychosocial problems to specialized psychosocial care (infertility counselling or psychotherapy).(GPP)

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should

- provide preparatory information about medical procedures because it promotes compliance.(B)
- be aware that weight-loss programmes based on diet and exercise offered pre-ART treatment may be effective in reducing weight and body mass index (BMI).(B)

The guideline development group recommends that fertility staff

- consider providing patients with information about lifestyle behaviours that may negatively affect their general and reproductive health.(GPP)
- support patients in changing lifestyle behaviours that negatively affect their general and reproductive health, as well as their chances of treatment success.(GPP)

Relational and social needs

(relationship with partner, family, friends and larger social network, and work)

The guideline development group recommends that fertility staff

- offer additional psychosocial care to patients at risk of experiencing increased infertility-specific relational and social distress. (GPP)
- actively involve both partners of the couple in the diagnosis and treatment process.(GPP)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should provide preparatory information about medical procedures because it decreases infertility-specific anxiety and stress.(C)

The guideline development group recommends that fertility staff

- refer patients identified by the SCREENIVF as being at risk of emotional problems to specialized psychosocial care (infertility counselling or psychotherapy).(GPP)
- actively involve both partners of the couple in the diagnosis and treatment process.(GPP)

Cognitive needs

(knowledge and concerns)

Fertility staff should provide preparatory information about medical procedures because it increases patient knowledge.(C)

DURING TREATMENT

WHAT ARE THE NEEDS OF PATIENTS DURING TREATMENT?

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should be aware that

- around 1 in 12 patients and 1 in 5 patients do not comply with first-line and ART treatment, respectively.(A)
- the reasons patients state for discontinuing recommended first-line treatment are: postponement of treatment (i.e., stopping treatment for at least 1 year), logistics and practical reasons, rejection of treatment, perception of poor prognosis, and the psychological burden of treatment.(A)
- the reasons patients state for discontinuing recommended treatment after one failed IVF/ICSI cycle are: financial issues, the psychological and physical burdens of treatment, clinic-related reasons and organizational problems, postponement of treatment (or unknown), and relational problems.(A)
- the reasons patients state for discontinuing a recommended standard ART treatment programme of three consecutive cycles are: postponement of treatment, the psychological burden of treatment, the physical and psychological burdens of treatment, and personal problems.(A)

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that

- relational satisfaction of patients does not change from before they start an IVF/ICSI cycle to after the pregnancy test.(B)
- women report more intimacy with their partner during an IVF/ICSI cycle than during a normal menstrual cycle, in particular at the retrieval and transfer days of the cycle.(B)
- women experience lower sexual satisfaction after the pregnancy test than before the start of an IVF/ICSI cycle.(B)
- women report lower social support from significant others in the period between the oocyte retrieval and the embryo transfer of an IVF/ICSI cycle than during the equivalent period in a normal menstrual cycle.(B)
- during an IVF/ICSI cycle, 6 in 10 patients report treatment-related absences from work and, on average, patients miss 23 h of work.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- patients' emotional stress fluctuates during an IVF/ICSI cycle, with peaks at the oocyte retrieval, the embryo transfer, and the waiting period before the pregnancy test.(B)
- women's positive affect decreases during an IVF/ICSI cycle.(B)
- anxiety and stress are higher when patients are anticipating results (e.g., in the waiting period before the pregnancy test, between oocyte retrieval and embryo transfer).(B)
- patients experience high emotional distress when they are informed that the treatment was unsuccessful.(B)
- when they are informed that the treatment was unsuccessful, 1 to 2 in 10 women experience clinically significant levels of depressive symptoms.(B)
- after receiving the pregnancy test for their IVF/ICSI treatment, 1 in 4 women and 1 in 10 men have a depressive disorder. One in 7 women and 1 in 20 men have an anxiety disorder.(B)

Cognitive needs

(knowledge and concerns)

Fertility staff should be aware that patients report moderate to high concerns about achieving pregnancy with a healthy live birth, that do not decrease across treatment.(C)

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS DURING TREATMENT?

GENERAL RECOMMENDATION

The guideline development group recommends the fertility staff use the tools listed in Appendix 2 when assessing patients' needs.(GPP)

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should be aware that currently there are no reliable tools or predictors to identify patients not likely to comply with recommended treatment.(B)

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that

- at the start of ovarian stimulation, at oocyte retrieval, and after the pregnancy test, men report lower perceived support than women.(C)
- men report higher social isolation than women during an IVF/ICSI treatment cycle.(C)
- patients with lower education level or physical or emotional complaints due to IVF/ICSI may take more treatment-related hours off work.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- women are more likely to experience anxiety, depression, stress, and/or psychiatric morbidity than men.(B)
- the number of previous treatment cycles is not associated with depression, anxiety, or incidence of psychiatric disorders for men and women undergoing treatment.(C)
- patients undergoing mild stimulation IVF/ICSI (as opposed to standard stimulation) are more likely to experience negative emotional reactions at oocyte retrieval but less likely to experience these reactions during hormonal stimulation and after a treatment cycle cancellation or failure.(C)
- patients with a previous history of vulnerability to mental health disorders are more likely to experience depression, anxiety, and/or psychiatric morbidity during treatment.(C)
- the ways women deal with their fertility problems are associated with infertility-specific distress;
 - The use of avoidant coping (e.g., avoiding being amongst pregnant women) is associated with higher infertility-specific distress.
 - The use of emotional expressive coping (e.g., expressing feelings to significant others) is associated with lower infertility-specific distress.(C)
- patients with low acceptance of infertility and childlessness are more likely to experience anxiety and depression when they are informed that the treatment was unsuccessful.(C)
- patients who experience high helplessness regarding infertility and its treatment are more likely to experience anxiety and depression when they are informed that the treatment was unsuccessful.(C)
- in couples, the way one partner reacts to infertility and its treatment is associated with how the other partner reacts.(C)

Cognitive needs

(knowledge and concerns)

Fertility staff should be aware that currently there are no reliable methods or information about predictors of the concerns patients have about treatment.(C)

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS DURING TREATMENT?

GENERAL RECOMMENDATION

The guideline development group recommends that fertility staff refer patients at risk of experiencing clinically significant psychosocial problems to specialized psychosocial care (infertility counselling or psychotherapy).(GPP)

Behavioural needs

(lifestyle behaviour, exercise, nutrition and compliance)

The guideline development group recommends that fertility staff offer patients the opportunity to discuss uptake or not of recommended treatment and receive decisional support to deliberate their choice.(GPP)

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that

- offering the currently available interactive complex interventions* is not likely to improve patient interpersonal relationships or sexual concerns.(B)
- providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to improve their social support.(B)

The guideline development group recommends that fertility staff

- offer additional psychosocial care to patients with specific characteristics associated with social isolation or absence from work.(GPP)
- actively involve both partners of the couple in the treatment process.(GPP)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- offering the currently available complex interventions* is not likely to improve patients' depression levels.(B)
- providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to improve their emotional well-being (anxiety, depression, and self-efficacy).(B)

The guideline development group recommends that fertility staff

- offer additional psychosocial care to patients with specific characteristics associated with negative emotional reactions.(GPP)
- actively involve both partners of the couple in the treatment process.(GPP)

Cognitive needs

(knowledge and concerns)

Fertility staff should be aware that providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to increase their knowledge about infertility and its treatment.(B)

The guideline development group recommends that fertility staff offer patients the opportunity to discuss and clarify their treatment related concerns.(GPP)

*Complex interventions integrate several psychosocial components (e.g., information provision, continuity of care, training in coping, or relaxation strategies (Craig, et al., 2008).

AFTER TREATMENT

WHAT ARE THE NEEDS OF PATIENTS AFTER TREATMENT?

UNSUCCESSFUL TREATMENT

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

-

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that about 2 years after unsuccessful IVF/ICSI treatment patients are generally satisfied with their marital relationship.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

-

Cognitive needs

(knowledge and concerns)

-

PREGNANCY AFTER TREATMENT

Behavioural needs

(lifestyle behaviour, exercise, nutrition, and compliance)

Fertility staff should be aware that women who achieve pregnancy with fertility treatment practice lifestyle behaviours that are similar to women who conceive spontaneously.(C)

Relational/social needs

(relationship with partner, family, friends and larger social network, and work)

Fertility staff should be aware that the way patients relate to their foetus is similar whether the foetus is conceived with ART treatment or spontaneously.(C)

Emotional needs

(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)

Fertility staff should be aware that

- women who conceived with IVF/ICSI do not experience more symptoms of depression, worse self-esteem or worse mental health during pregnancy than women who conceive spontaneously.(A)
- women who conceived with IVF/ICSI may experience more pregnancy-specific anxiety than women who conceived spontaneously.(B)

Cognitive needs

(knowledge and concerns)

Fertility staff should be aware that women with multiple pregnancies after IVF/ICSI may have higher maternal expectations than women with spontaneous multiple pregnancies.(C)

- indicates the absence of recommendations for this aspect of psychosocial care.

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS AFTER TREATMENT?

<p>GENERAL RECOMMENDATION</p> <p>The guideline development group recommends that fertility staff use the tools listed in Appendix 2 when assessing patients' needs.(GPP)</p>
<p>UNSUCCESSFUL TREATMENT</p> <p>Behavioural needs <i>(lifestyle behaviour, exercise, nutrition, and compliance)</i></p> <p>Fertility staff should be aware that former patients who remain childless 5 years after unsuccessful IVF/ICSI treatment may use more sleeping pills, smoke more often, and consume more alcohol than former patients that become parents via adoption, or spontaneously.(C)</p> <p>Relational/social needs <i>(relationship with partner, family, friends and larger social network, and work)</i></p> <p>Fertility staff should be aware that former patients that remain childless 5 years after unsuccessful IVF/ICSI treatment are three times more likely to separate than former patients that become parents via adoption, or spontaneously.(C)</p> <p>Emotional needs <i>(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)</i></p> <p>Fertility staff should be aware that</p> <ul style="list-style-type: none"> • women who remain childless 10 years after unsuccessful IVF/ICSI treatment are not more likely to develop psychiatric disorders than women of the same age who never underwent fertility treatment.(C) • women with a persistent desire for pregnancy 3 to 5 years after unsuccessful treatment may experience more anxiety and depression than women who find new life goals or women who become mothers.(C) <p>Cognitive needs <i>(knowledge and concerns)</i></p> <p>-</p>

<p>PREGNANCY AFTER TREATMENT</p> <p>Behavioural needs <i>(lifestyle behaviour, exercise, nutrition, and compliance)</i></p> <p>-</p> <p>Relational/social needs <i>(relationship with partner, family, friends and larger social network, and work)</i></p> <p>-</p> <p>Emotional needs <i>(depression, anxiety, stress/distress, psychopathology, psychiatric disorders, general well-being, quality of life, etc.)</i></p> <p>Fertility staff should be aware that</p> <ul style="list-style-type: none"> • women who experienced multiple failed ART cycles or high stress during treatment may be more likely to experience symptoms of anxiety during pregnancy.(C) • patients with multiple pregnancies after ART are not more likely to experience poorer mental health than patients with a single ART pregnancy.(C) <p>Cognitive needs <i>(knowledge and concerns)</i></p> <p>-</p>

- indicates the absence of recommendations for this aspect of psychosocial care.

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS AFTER TREATMENT?

UNSUCCESSFUL TREATMENT

Behavioural - Relational/social - Emotional - Cognitive needs

The guideline development group recommends that fertility staff

- refer patients who, when ending unsuccessful treatment, experience or are at risk of experiencing (in the short or long term) clinically significant psychosocial problems to specialized psychosocial care (infertility counselling or psychotherapy).(GPP)
- offer additional psychosocial care to patients who, when ending unsuccessful treatment, are at risk of increased infertility-specific psychosocial distress.(GPP)
- offer patients the opportunity to discuss the implications of ending unsuccessful treatment.(GPP)

PREGNANCY AFTER TREATMENT

Behavioural - Relational/social - Emotional - Cognitive needs

The guideline development group recommends that fertility staff

- refer patients who experience or are at risk of experiencing clinically significant psychosocial problems after successful treatment to specialized psychosocial care (infertility counselling or psychotherapy).(GPP)
- offer additional psychosocial care to patients at risk of increased infertility-specific psychosocial distress after successful treatment.(GPP)
- offer patients the opportunity to discuss their worries about pregnancy achieved with fertility treatment.(GPP)

Reference

Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M, Medical Research Council G. Developing and evaluating complex interventions: the new Medical Research Council guidance. *Bmj* 2008;**337**: a1655.

CONCLUSIONS AND CONSIDERATIONS

The evidence reviewed for the development of this ESHRE Guideline provides clear guidance for the incorporation of psychosocial care in routine fertility care.

1. Patients have clear preferences about the psychosocial care they receive at fertility clinics. Fertility staff should be aware of these preferences and consider addressing them.

Patients value the contact with sensitive and empathic staff members who provide support for their individual needs, pay attention to the emotional impact of infertility, and involve both partners in the treatment process and all related decision-making.

Patients also value that fertility clinics ensure the professional competence of their staff members, minimal waiting times, continuity of care, and the opportunity to contact other patients and to access specialized mental health services in case of need.

The available evidence about the different psychosocial components that patients value is limited to information provision. It shows that patients value receiving written customized information about treatment options and explanations of results, as well as available psychosocial support options.

Further steps were taken to investigate whether these different aspects of psychosocial care have an actual impact on patient emotional well-being. Cross-sectional research showed that the different staff and clinic characteristics that patients value are indeed associated with higher emotional well-being. Information provision, in particular the provision of preparatory information, decreases patient infertility-specific anxiety and stress. In addition, tailored online psycho-educational interventions also improve the emotional well-being of specific groups of patients, for instance, highly distressed patients.

2. The needs of patients vary across treatment stages and therefore psychosocial support should be tailored accordingly. Fertility staff must be informed about the specific needs that patients experience at different treatment stages.

Before treatment, patients' needs seem to be mainly related to behaviours that do not optimize their chances of pregnancy, namely non-compliance with recommended treatment and unhealthy lifestyle behaviour.

During treatment, patients have multiple needs. At the behavioural level, 1 in 12 patients do not start treatment and 1 in 5 patients do not comply with recommended treatment. At the relational level, women may lack adequate support from significant others and are absent from work due to treatment. Emotional and cognitive needs are related to the uncertainty about the outcome of treatment, and tend to peak just before the oocyte retrieval, embryo transfer, and the pregnancy test. Finally, patients experience intense distress when treatment is unsuccessful.

During pregnancy, the needs of previously infertile patients do not seem to differ from those of couples who conceived spontaneously. The most significant issue to highlight is that they tend to be more anxious about their pregnancy, especially when they underwent repeated treatment cycles that were perceived as very stressful.

The needs of patients who experienced **unsuccessful fertility treatment** are not documented. There are indications that individuals who were childless before treatment and therefore remain childless after treatment present worse emotional well-being than individuals with children.

3. Some patients are more vulnerable to the demands of treatment and therefore need additional psychosocial support. Fertility staff must be aware of specific patient characteristics that indicate a risk of experiencing increased needs or problems before, during, or after fertility treatment.

Certain patient characteristics are associated with or predictive of specific psychosocial needs or problems. These are described in Table II.1. Fertility staff must be aware of these patient characteristics and of the specific needs they predict.

Fertility staff should also use valid infertility-specific or generic assessment tools to assess patient needs. Appendix 2 of the current guideline provides a list of valid tools that can be used by all fertility staff for the purpose.

Before the start of treatment, fertility staff can use the SCREENIVF to identify those patients at risk of developing emotional problems after receiving notice of the treatment outcome.

Table II.1. Specific patient characteristics that indicate a risk of experiencing increased needs or problems before, during, or after the treatment period.

Needs	Before treatment	During treatment	After treatment	
			Pregnancy	Unsuccessful
Behavioural				Being childless.
Relational and social	Being a woman and using avoidance coping strategies. In couples, having different views about the importance of parenthood and infertility related social concerns.	Being a man, having lower educational level and having treatment-related physical or emotional complains.		Being childless.
Emotional	Being a woman, having lower occupational status and using passive coping strategies (e.g., rumination, withdrawal). In couples, having an avoidant and non-responsive partner and (for women) having a partner diagnosed with male factor infertility.	Being a woman, having a previous history of vulnerability to mental health disorders, having low acceptance of infertility and childlessness, experiencing high helplessness regarding infertility and its treatment, and using avoidance coping strategies.	Having undergone multiple ART cycles or experienced high stress during treatment and having a multiple pregnancy.	Being childless and sustaining a child-wish.
Cognitive				

Blank cells indicate no information.

4. *The most effective way to start incorporating psychosocial care in routine fertility care is by improving information at clinics.*

Providing preparatory information before the start of treatment increases compliance, reduces anticipatory anxiety and stress, and increases patient knowledge about treatment-related issues. Information provision is highly valued by patients and they have clear preferences about how they want to receive it.

Information should be provided in written format before the start of treatment, and it should be customized to the patient and should focus on treatment options and results, as well as available psychosocial support options. Immediate positive effects can be expected because preparatory information provision was shown to address multiple patient needs and to be highly valued by patients themselves. In addition, compared with other existing care components such as complex interventions or specialized mental health services, information provision should be fairly simple and feasible to implement and incorporate in routine care.

The GDG is confident that these four points summarize the way forward that fertility clinics should be aiming for. The recommendations listed in this document provide more detailed guidance on how to implement these measures. However, we are aware that the amount of guidance provided is limited. Indeed, several topics were found for which there is insufficient evidence to answer the key questions, in particular regarding efficient psychosocial interventions that staff can use to address patient needs and regarding the after treatment period. This is partly due to the absence of evidence from the primary research reviewed, on which the recommendations were based, and partly due to the methodological approach adopted in the review process.

Indeed, it has to be acknowledged that historically the field has not been focusing on the provision of routine psychosocial care by staff but on the specific tasks mental health professionals perform at fertility clinics, such as counselling and the validation of psychological interventions. In addition, it has mostly been focusing on optimizing patients' treatment experience but has neglected to some extent to consider that there is still a responsibility to support patients managing the implications of (successful or unsuccessful) treatment.

Furthermore, the available research is highly heterogeneous and lacks operational definitions and precision. For instance, well-being measures and risk factors considered in studies varied from anxiety and depression to optimism, self-efficacy, coping, etc., and were used interchangeably with no theoretical consideration of how they were expected to be related. Other methodological limitations of the research reviewed were the lack of clarity about sampling methods, low response rates, use of non-validated psychological assessment tools, small sample sizes that do not allow for the detection of small effect sizes, etc. Research on specific issues, such as patient preferences, has mostly been developed using what are considered low-quality methods such as interviews, focus groups, or surveys. Low-quality studies (29/488, 6%) were excluded from guidelines because they did not meet the evidence

grade (D) for guidelines. More effort should be given to improving quality in future psychosocial studies.

Finally, the GDG made several conceptual and methodological decisions that also imposed constraints on the eligible evidence. The scope of the guideline had to be narrow so that the evidence-based approach advocated in the *Manual for ESHRE Guideline Development* could be implemented in the 2-year time-span advised in the Manual. It should be noted, however, that 12 different PICO questions were defined and 12 full systematic reviews implemented, which included published and non-published available evidence from 1990 to April 2014. The need to achieve specificity in relation to patient needs and treatment stages also led to the necessity to impose artificial boundaries regarding eligible studies. For instance, studies based on heterogeneous samples of patients at different treatment stages were not included. Additional inclusion criteria adopted, such as the use of validated psychological measures to assess patient needs, resulted in further exclusions.

Overall, the GDG is confident that the recommendations described in the current ESHRE Guideline are based on the best available evidence published in the field from January 1990 to April 2014. The gaps in the guidance provided should therefore be considered as a roadmap to guide future research. In appendix 5, we summarize the main topics for future research within the field and provide conceptual and methodological advice for its implementation.

1. PSYCHOSOCIAL CARE IN FERTILITY CLINICS: PATIENTS' PREFERENCES AND WELL-BEING

Introduction

This section provides a comprehensive view of studies investigating patient preference and the value they attribute to different fertility staff and clinic characteristics and to different psychosocial care components. An overview of which staff and clinic characteristics and psychosocial care components are associated with patient well-being is also provided.

The indicators of value are patients' stated preferences for a staff or clinic characteristic or psychosocial care component. These include an expressed desire or want in relation to a particular option, and/or indication that a particular option is perceived to be important, appreciated, worthwhile, beneficial, and/or any other expression of esteem for the option. Valuing is addressed to care that has been received and/or care that is anticipated. Therefore we consider patient preferences and attributed value or importance instead of patient satisfaction with services. Satisfaction indicates whether services are adequate, but not which aspects of care are important to patients.

The first part of this key question describes which characteristics of fertility staff and clinics are valued by or are important to infertile patients.

The second part describes psychosocial care components that are valued by infertile patients.

The third part describes which characteristics of fertility staff and clinics and care components are associated with the emotional (anxiety, depression, quality of life, and stress), and relational and social well-being of infertile patients.

1.1 Patients' preferences

Key question

WHICH ASPECTS AND COMPONENTS OF PSYCHOSOCIAL CARE ARE IMPORTANT TO PATIENTS?

Rationale of the key question

The aim of identifying the staff characteristics that are important to patients during their fertility care is to enable fertility staff to reinforce these aspects and enhance the quality of their relationships with patients. The aim of identifying the clinic characteristics that are important to patients during their fertility care is to reinforce these aspects in order to enhance the quality of clinic's patient-centred care.

1.1.a Fertility clinic staff characteristics

The specific staff characteristics included in this section are attitude of and relationship with staff, communication, patient involvement, decision-making, and privacy and emotional support.

Clinical evidence

A systematic review published in 2010 included 51 studies from 14 countries, evaluating patients' experiences with fertility care (Dancet, *et al.*, 2010). The mean sample size was 100 participants per study (range 16-194). Each characteristic with a positive assessment, by at least 20% of patients in every study evaluating it was noted as important with consensus. Characteristics of staff rated as important by patients were patients' involvement in decision-making, respectful and courteous staff attitudes, relationship with staff, trust in the staff, and sensitivity of the staff. Patients also wanted their partner to be involved in the treatment process and valued receiving emotional support from the staff during their daily (medical) care.

A Danish longitudinal cohort study, included in the review of Dancet (2010), collected data on the preferences of 1169 women and 1081 men undergoing or having undergone any type of fertility treatment (Schmidt, *et al.*, 2003). For 85% of women and 75% of men it was important that fertility staff show understanding towards patients, and for 72% of women and 62% of men that they show concern.

A cohort study using discrete choice experiments collected data from 925 individuals undergoing any stage of fertility treatment at eight ART clinics (van Empel, *et al.*, 2011). In the study, patients' choices (choosing or changing clinic), and willingness to trade off ongoing pregnancy rates in favour of other care attributes, were evaluated. Positive attitudes of staff were one of the most important predictors for choosing a clinic. Of the 25% participants that changed clinics, 61% (70/114) changed for lack of patient-centredness. Furthermore, patients were willing to sacrifice a higher ongoing pregnancy rate for a more attentive attitude from physicians.

In a similar cohort study, using conjoint analysis, choices of 331 patients for different clinical scenarios were assessed (Ryan, 1999). The choices made for the different scenarios presented showed positive signs for attitudes of staff and treatment success rate. No participant always chose the scenario with the highest chance of leaving the service with a child, suggesting that individuals were willing to make trade-offs with other attributes such as attitude of staff.

A cohort study combining focus groups (24 couples), and questionnaires completed by 888 couples, assessed patient preferences for dimensions of care (van Empel, *et al.*, 2010). Patients considered it important that staff paid attention to the emotional impact of infertility, that personal attention was received from the nurses, and that nurses showed understanding.

A systematic review of 19 studies on couples having used Preimplantation Genetic Diagnosis (PGD) showed that continuous attention and a realistic attitude of fertility staff was important to patients (Karatas, *et al.*, 2010).

Conclusion and considerations

The evidence shows that patients value that all members of fertility staff present a good attitude: meaning attention, respect, courtesy, empathy, and understanding. Patients also value being involved in decision-making, their partner being involved in the treatment process, and staff paying attention to the emotional impact of infertility.

Patients using PGD value continuous attention and a realistic attitude of fertility staff. It is unclear whether these preferences are specific to this population or reflect more general patient preferences (not specific to this population).

The evidence described, even when summarized within systematic reviews or collected within a cohort study design, is mainly based on patient surveys or mixed methods studies that include qualitative data. It usually enquires about general staff or patient characteristics, such as sensitivity or patient involvement, without making reference to specific behaviours and/or measures that could be enhanced at the clinics.

Future research should strive to better define the staff behaviours and/or skills and critical moments for special attention, as well as specific preferences in pre-defined populations (e.g., socio-cultural background, specific medical needs). For the evaluation of preferences, data should be obtained from representative populations of infertile patients, and the problems of low participation and high attrition rates should be addressed or at least reported.

The reviewed literature could not differentiate between the preferences of patients with and without previous experience of fertility treatment. Such differentiation is important because experiencing a challenge makes individuals more aware of the types of care they need and/or value. The use of prospective designs targeting precisely defined attributes should allow for a better differentiation between patients' expectations before consulting an infertility clinic and their preferences after having experienced treatment.

Recommendations

Fertility staff should be aware that patients value how staff relate to them (<u>Ryan, 1999; Schmidt, et al., 2003; Dancet, et al., 2010; van Empel, et al., 2010; van Empel, et al., 2011</u>).	A
Fertility staff should be aware that patients value staff showing understanding and paying attention to the emotional impact of infertility (<u>Schmidt, et al., 2003; Dancet, et al., 2010; van Empel, et al., 2010</u>).	A
Fertility staff should be aware that patients value that both partners are involved in the treatment process (<u>Dancet, et al., 2010</u>).	A

Fertility staff should be aware that patients value being involved in decision-making (Dancet, et al., 2010).	A
Fertility staff should be aware that patients value receiving psychosocial care from sensitive and trustworthy staff members (Dancet, et al., 2010; van Empel, et al., 2010).	A
Fertility staff should be aware that patients value receiving attention to their distinct needs related to their medical history (Karatas, et al., 2010).	B

1.1.b Clinic characteristics

The specific clinic characteristics considered were information, competence of clinic and staff, coordination and integration, accessibility, continuity and transition of care, and physical comfort ([Dancet, et al., 2010](#); [Dancet, et al., 2011](#)).

Clinical evidence

A systematic review (previously described) identified clinic characteristics which were marked as important by at least 20% of patients having experienced fertility care, in all studies ([Dancet, et al., 2010](#)). The clinic characteristics important to patients were the timing of referral, the waiting time during treatment, the frequency of appointments, the costs, the distance to the clinic, the duration of consultation, and the waiting time for the first appointment. Similarly, the offer of comprehensive testing and treatment, a well-organized clinic, adequate time for discussion, personalized care, competence of the staff, and continuity of care were considered important. The accommodation was also important, in particular that the fertility clinic be a separated part of the clinic. Further important characteristics were the provision of opportunities to contact previous patients, and the organization of live support groups with other patients. The provision of counselling/emotional support by mental health professionals was evaluated as important but without consensus. More precisely, the studies on IVF populations showed the provision of counselling to be consistently important, but those studies performed on general populations of infertile patients, including investigations and other treatments, did not.

The cohort study of van Empel used discrete choice experiments (925 patients in eight ART clinics) to evaluate patients' choices (choosing or changing clinic) and willingness to trade off ongoing pregnancy rates in favour of other care attributes ([van Empel, et al., 2011](#)); 51% of patients chose the nearest fertility clinic and never changed, 25% chose the nearest and then changed. Patients (24%) choosing a clinic further from home stated the following non-medical reasons: positive stories of patient-centredness (38%), the reputation of the clinic (25%), practical reasons (27%), or high pregnancy rates (10%).

In the cohort study of Ryan and colleagues using conjoint analysis, choices of 331 patients for different clinical scenarios were assessed (Ryan, 1999). The choices made for the presented scenarios showed preferences for continuity of care and treatment success rates, over longer waiting times, higher costs, and follow-up support. None of the participants always chose the scenario with the highest chance of leaving the service with a child, suggesting that they were willing to make trade-offs with other attributes.

Conclusion and considerations

Important clinic characteristics, as rated by infertile patients, are the professional competence of the fertility staff, offers of personalized care, a good organization allowing for minimal waiting times for patients, sufficient time for the consultations, and continuity of care. Patients value being in a clinic dedicated to infertility care. Furthermore, they value the offer of live support group sessions or contact with other patients.

The availability of specialized psychological support is noted as important by studies on IVF populations but not consistently by studies on general infertile populations.

The members of the Guidelines Group note, from clinical experience, that patients value the possibility to receive psychosocial services from mental health professionals in case of need for emotional support. In addition, some patients may value the presence of a chaperone during medical examinations (Ouj, et al., 2011). Furthermore, clinics could consider the importance, for male patients, of being provided with specific and adapted rooms for producing sperm samples.

Clinics intent on reinforcing the quality of care for their patients could benefit from more precise indications for enhancing clinic characteristics. Future research should strive to better define the meaning of ‘competence’ of staff, how much time is ‘sufficient’ for a consultation, and what is ‘continuity of care’. More precision is also needed on the characteristics of facilities, such as waiting rooms and the adequate equipment in rooms for procuring sperm samples. The adequate manner in which to provide specialized psychosocial support by mental health professionals should be evaluated in different populations of infertility patients. These studies should cover representative populations and allow for better distinction between hypothetical preferences and those arising from experience, for example through a prospective longitudinal design.

Recommendations

<p>Fertility staff should be aware that patients value minimal waiting times, not being hurried in medical consultations, and continuity of care (Ryan, 1999; Dancet, et al., 2010).</p>	<p>A</p>
<p>Fertility staff should be aware that patients value the professional competence of fertility staff and receiving personalized care (Dancet, et al., 2010).</p>	<p>A</p>

Fertility staff should be aware that patients value the provision of opportunities for contact with other patients (<u>Dancet, et al., 2010</u>).	A
Fertility staff should be aware that patients value being in a clinic dedicated to infertility care (<u>Dancet, et al., 2010</u>).	A
Fertility staff should be aware that patients value the offer of specialized psychosocial care (infertility counselling or psychotherapy) before, during, and after IVF treatment (<u>Dancet, et al., 2010</u>).	B
The guideline development group recommends fertility staff to be aware that patients expressing a need for emotional support value the offer of specialized psychosocial care (infertility counselling or psychotherapy).	GPP
The guideline development group recommends fertility staff to be aware that patients may value the presence of a chaperone during medical examinations.	GPP
The guideline development group recommends fertility staff to be aware that men value rooms designated for producing sperm samples.	GPP

1.1.c Psychosocial care components

Key question

WHICH PSYCHOSOCIAL CARE COMPONENTS (THAT CAN BE DELIVERED BY FERTILITY STAFF) ARE IMPORTANT TO PATIENTS?

Rationale of the key question

The aim of identifying the psychosocial care components that are important to patients during their fertility care is to reinforce these aspects in order to enhance the quality of their patient-centred care.

A care component was considered psychosocial if its content (e.g., relaxation, education), technique (e.g., breathing exercises, modelling), proposed mechanism of action (e.g., increased knowledge about consequences, belief change), method of delivery (e.g., interpersonal support, expressive writing), or targeted outcome (e.g., well-being, quality of

life) was psychological (i.e., related to mental or emotional needs) and/or social (i.e., interpersonal needs) (Abraham and Michie, 2008; Hodges, *et al.*, 2011).

Studies were excluded if they evaluated: (1) medical procedures (e.g., pen types, analgesics, number of injections, mild ovarian stimulation); (2) specific medical approaches (e.g., third-party reproduction, surrogacy, embryo disposition, preimplantation genetic diagnosis for sex selection, foetal reduction in multiple pregnancies) and predictors of treatment choices (e.g., effect of cost on utilization of fertility services, effect of success rates on number of embryos transferred).

Clinical evidence

In a review of 51 studies (41 questionnaire, 7 interview, 3 both) concerned with patient perspectives on fertility care, the following outcomes were assessed: (1) value clarification defined as the degree of importance attached to care aspect (e.g., expressed patient needs, preference, importance rating); and (2) service evaluation assessment defined as the difference between consumer expectations and perceptions with respect to services delivered (e.g., patient rating of an experience, satisfaction rates); or (3) both (e.g., reason for (dis)satisfaction) (Dancet, *et al.*, 2010). The dimensions relevant to psychosocial care and remit of this question were the dimensions of 'Information, communication, and education' and 'Emotional support and alleviation of fear and anxiety'. The authors concluded that the following aspects of 'information, communication, and education' were considered important in at least one study: general information (six studies), written information (two studies) and information about alternatives to medical treatment (one study), diagnosis (one study), patients helping themselves to become pregnant (one study), known plan for the future (one study), and having sufficient information (one study) and time for discussion (one study). Furthermore, the following aspects of 'Emotional support and alleviation of fear and anxiety', were considered important: contact information about psychosocial support options (six studies), organized contact with previous patients (one study), and emotional support during (medical) care (one study).

Hope and colleagues evaluated which format (DVD or written brochure) influenced preference of Australian patients for elective single or double embryo transfer (eSET, eDET, respectively) (Hope and Rombauts, 2010). Embedded in the set of outcomes were questions about the scariness of information and whether the intervention (DVD, brochure) would be recommended to others, which could be considered indication of value. Patients ($n = 189$) were randomized to receive an educational DVD or brochure contrasting success rates and risks eSET versus eDET. The DVD contained video clips of experiences, in addition to the same factual information as the brochure. The results showed that men and women receiving the brochure were less scared of having twins and more willing to recommend the intervention to other couples compared with patients receiving the DVD. Although not the primary outcome of the study, these results suggest that mode of information delivery may affect how the same information is perceived.

In a randomized controlled trial, included in the review of Dancet and colleagues (2010), patient preferences for how the follow-up call to discuss the next treatment plan is handled after unsuccessful fertility treatment were evaluated (Stewart, *et al.*, 2001). As the call

concerns provision of information, the intervention could be seen to fall within remit of this question. Patients with a failed cycle ($n = 175$) were randomized to receive a follow-up telephone call or an in-person appointment. When asked about future preference for follow-up after participating in the trial, couples randomized to an in-person appointment ($n = 75$) stated they would prefer: an in-person appointment, 55% (39/71); a call, 28% (20/71); or other 17% (12/71). Couples randomized to a call ($n = 84$) preferred: an in-person appointment, 38% (30/79); a call, 41% (32/79); or other, 22% (17/79) (excludes nine cases in which no further treatment was planned). The difference in preference was not significant overall. *A posteriori* sub-group analysis showed that preference for call/in-person appointment was significant according to whether people lived more or less than 50 miles from the clinic; of the patients living more than 50 miles from the clinic, 47% preferred calls and 29% preferred an in person appointment, compared with 23% and 62%, respectively among the couples living nearby. These results suggest that practical constraints may influence preference for how information is delivered to patients. The results show that overall patients do not seem to prefer telephone over in-person follow-up.

Mourad and colleagues implemented a cluster-RCT (16 clinics) to assess the effectiveness of an intensive implementation support intervention designed to improve adherence to Dutch national guidelines for fertility care ([Mourad, et al., 2011](#)). Clinics were randomized to either minimal or maximal support, the latter receiving educational leaflets for patients as part of multi-faceted intensive support tools. Physicians were responsible for distributing these leaflets. Effectiveness was examined by comparing adherence collected 2 years later (3 to 9 months after intervention). Of the 696 patients treated at a clinic with maximal support, 260 (37%) reported having received the information leaflet. Of these, 83% would want to receive comparable leaflets in the future and 97% would recommend the leaflets to peers. The three leaflets provided background information and the content of the professional guideline, questions that patients could ask during consultation to improve shared decision-making, and references for three topics (initial assessment of fertility, first-line treatment, and assisted reproductive techniques). The results suggest that the patients appreciated the leaflets, but importantly they also showed that reliance on the medical team to distribute preparatory information could be problematic.

A web-based cognitive behavioural therapy based on a self-help bibliography text for infertile women was evaluated in an RCT by Sexton and colleagues ([Sexton, et al., 2010](#)). Women undergoing fertility treatment at multiple clinics in the USA were invited, and those interested ($n = 43$) were randomized to a 2-week exposure period to the online version of the anxiety and depression modules ([Jacobs and O'Donohue, 2007](#)) or to a waiting list control group. The women assigned to the intervention were advised on the website that they were more likely to derive benefit with continued practice of intervention strategies, but were informed that they could use the site as much or as little as they would like. Access data for the web-intervention group indicated the percentage of participants visiting each page: 100% the introduction section, 76% the behavioural section, 43% the cognitive restructuring content, 48% the 'other coping skills' page, and 33% the personalized coping plan. These data show that participants accessed all psychosocial web-sections of the intervention. It is however unclear whether the percentages represent preference for specific content (e.g., general

information more than a personalized coping plan) or placement on the website (top page versus deeper layer).

The effectiveness of online information and support intervention for women with fertility problems was investigated in an RCT by Cousineau ([Cousineau, et al., 2008](#)). The evaluation also included data on usage that could indicate preference for some aspects of the intervention. Participants were assigned the program (with or without baseline assessment) or to a control group (with or without baseline assessment). The group assigned to the intervention received the online program 'Infertility Source: Interactive Support Tools When Trying to Conceive'. The program begins by asking each patient to complete a 'Confidence Check', based on the 'Infertility Self-Efficacy Scale' (ISE) ([Cousineau, et al., 2004](#); [Cousineau, et al., 2006](#)). This assessment serves as the tailoring mechanism of the online program, resulting in targeted feedback based on a high, medium, or low confidence level in the areas of: 'Taking care of yourself'; 'Managing your feelings'; 'Your relationship with your partner'; 'Managing your treatment'; and 'Your relationship with your healthcare provider'. This assessment also results in a prioritization of program content. Several outcomes were assessed, but here only the evaluation of the program by participants is reported. The participants ($n = 93$) (both with and without baseline assessment) receiving the online program visited the website on average four times, with an overall median time on site of 63 min; 36% of the participants spent at least 90 min, which was the estimated appropriate 'dose'. The program evaluation indicated that 90/93 perceived the online intervention as acceptable, and ratings (7-point Likert scale; 1 = not helpful, 7 = extremely helpful) showed that the medical information was perceived as 'informative' (median score 6); the online program was perceived as 'helpful' (score 5), an 'efficient use of one's time' (score 6), and more helpful 'compared with other websites' (score 6). In total, 12% of the participants reported that the program made them feel more distressed, and text data revealed that this was related to frustrations due to their situation or the focus on feelings. These results show that an online format is acceptable, that average scores indicate that it is perceived as helpful, but a small percentage of patients may find it depressing.

Lancastle and Boivin investigated the acceptability and feasibility of a Positive Reappraisal Coping Intervention (PRCI), designed to help women cope with the 2-week waiting period after embryo transfer ([Lancastle and Boivin, 2008](#)). In an RCT, women were randomized to using PRCI during the waiting period of an IVF/ICSI cycle, or to a control group reading 10 control positive statements, and were questioned about practicality, acceptability, psychological effects, and endorsements of the intervention. Results showed that the PRCI group rated the intervention as more helpful and suitable for the IVF/ICSI situation, they were more confident that the intervention had influenced the stressfulness of the waiting period, and they perceived the intervention as reducing stress to a greater extent, as compared with the control group. These results suggest that PRCI could be useful for medical waiting periods, but the effectiveness for reducing anxiety and depression during the waiting period before the pregnancy test is still to be evaluated.

One observational cohort study, included in the review of Dancet and colleagues (2010), investigated expectations and intentions to use psychosocial services in 1169 women and 1081 men about to undergo medically assisted reproduction (63% IVF/ICSI) ([Schmidt, et al.,](#)

2003). Participants were offered a list of possible services and asked to rate the importance of staff at the clinic providing these services. The percentages of women and men, respectively, rating each type of service as important were: explain test results (98.3, 98.5, $p = ns$); explain treatment options (98.5, 98.9, $p = ns$); written treatment information (82.0, 75.7, $p < 0.05$); information about adoption (25.0, 24.1, $p < 0.05$); show concern (71.7, 62.0, $p < 0.05$); show understanding (84.5, 75.4, $p < 0.05$); written information about psychosocial aspects of infertility (56.0, 44.9, $p < 0.05$); contact information for infertility associations (20.3, 16.4, $p < 0.05$). Women were more likely than men (11-21% vs 5-9%, depending on option) to indicate that they would participate in psychosocial services ('course on childlessness', 'professionally led support services', 'psychologist', 'sex therapist') if it would be available at the clinic. The results show that most male and female patients wanted verbal and written explanations about their treatment results and options and treatment generally (> 75%), and a sympathetic healthcare provider showing concern and understanding (> 62%), but fewer wanted written information about psychosocial aspects (< 56%), information about adoption (< 25%), or information about infertility associations (< 21%). Gender comparisons showed that men and women did not differ on importance of staff explaining test results or treatment options. However, women were significantly more likely to want written treatment information, information about adoption, psychosocial aspects of infertility, contact for infertility associations, and medical staff that showed concern and understanding. Overall, less than 21% of patients would use psychosocial care services (course on childlessness, professionally led support group, psychologist, or sex therapist). The results indicate that patients about to undergo treatment value both treatment-related and psychosocial information (especially women), but also information about alternatives.

In a discrete choice experiment, Van Empel and colleagues collected data from 925 individuals undergoing any stage of fertility treatment at eight ART clinics (van Empel, *et al.*, 2011). The authors evaluated patients' choices (choosing or changing clinic) and willingness to trade off ongoing pregnancy rates in favour of other care attributes. Physician's positive attitude (odds ratio (OR) = 2.83), clear and customized information (OR = 2.77), and ongoing pregnancy rate (OR = 0.29) were the most important predictors for choosing a clinic. Patients were willing (hypothetically) to sacrifice 9.6% (2.77/0.29) in pregnancy rate for receiving clear and customized information instead of contradictory information or only general information. Actual clinic choice behaviour ($n = 838$) showed that 25% of patients changed clinics, and of these 61% reported that it was due to a 'lack of patient-centredness' (i.e., overall 15% of patients change clinics because of a lack of patient-centred care).

A case-controlled study examined the use of a secure online health community forum for people attending a fertility clinic (MyCareNet) in The Netherlands (Aarts, *et al.*, 2013). The forum provided the opportunity for doctors to: (1) inform patients about relevant news by posting blogs; (2) enable patients to share experiences and communicate with other patients; and (3) provide patients with a media gallery where they could obtain digital information on infertility-related topics. Patients provided access to this forum by their medical team in one clinic were contacted to elicit their views about it. Only patients subscribing to the forum could use it. Using patient identification numbers, the research team grouped patients attending clinic in the 6 months after the launch of the forum into subscribers and non-subscribers to the forum, and from the latter into active versus non-active users. In total, 162 of 310 invited

non-subscribers (52.3%) participated and 116 of 141 subscribers (82.3%) participated; 74 of 116 active users (63.8%) participated. Patients in each group completed a survey 6 months after the start of the online community. Among the subscribers, 66.1% were classified as active users because they posted on the blog, asked questions of professionals, joined in discussions, or sought information. The remaining 33.9% were considered non-active because they were occasional spectators or never had visited the site after subscription. There was no difference between subscribers and non-subscribers in appreciation of the online community (rated 8/10, where higher scores show more appreciation) or with active users (9/10). Barriers and facilitators of subscription and active usage were examined based on a pre-defined list. In multivariate models, the variables remaining significant in predicting subscription were being female (OR = 10.5), undergoing ART (OR = 3.2), longer duration of infertility (OR = 1.35), patient-related barriers (OR = 0.20), and intervention-related facilitators (OR = 2.45). Patient-related barriers included preference for in-person contact, lack of need due to adequate support or existing knowledge, and lack of internet experience. Intervention facilitators related to ease of obtaining information, perceived reliability of information and perceived security, use of forum as back-up for questions to medical doctors, and support from other patients at same clinic. The factors remaining significant for active engagement were being younger (OR = 0.86), longer duration of infertility (OR = 1.48), and the intervention-related facilitators (OR = 5.79).

Conclusions and considerations

Patients value the provision of treatment-relevant information, but heterogeneity in primary studies means that one cannot be very specific about the valued characteristics of that information. Patients prefer clear and customized treatment information compared with only general information, or contradictory information. What 'customized' means is not known.

Patients could have preferences about how information about treatment options is presented (e.g., written, DVD, in-person) and staff could try to provide information in the preferred format.

Patients value the provision of information on infertility psychosocial support options (e.g., support groups, counselling) even if they do not plan to use these services.

Women value more than men psychosocial information, but both men and women value information about their treatment results and options similarly. In addition, women are more likely to use online health community services.

Patients do not have a preference for in-person or telephone consultation to receive follow-up information after failed fertility treatment, but more research is needed on whether this preference differs according to distance from clinic.

The search and review procedure generated a very narrow selection of psychosocial care components (mainly information delivery) because research on other components was not there, was examined using low-grade methods (interviews, focus groups, questionnaires) or, if higher-grade, was of poor quality. Therefore, there is not much information in the present section about the valuing of other care components (e.g., communication strategies, decisional support, peer support, coping skills training, and pastoral interaction). Finally, the

set of studies included in the review, although mainly addressing information provision, were nevertheless very heterogeneous concerning population, materials, procedure, and methodology. In order to synthesize the information, it the assumption was made that studies using different designs, different sentence wordings, or different measures of psychosocial care, were equivalent. There is probably truth to this assumption; however, more confidence could be placed in conclusions if eight similar studies found the same result as opposed to eight different studies.

Recommendations

<p>Fertility staff should be aware that patients value written treatment-relevant information (<u>Schmidt, et al., 2003</u>; <u>Dancet, et al., 2010</u>; <u>Mourad, et al., 2011</u>).</p>	<p>C</p>
<p>Fertility staff should be aware that patients value explanations about treatment results and treatment options (<u>Schmidt, et al., 2003</u>).</p>	<p>C</p>
<p>Fertility staff should be aware that patients value understandable and customized (i.e., personally relevant) treatment information (<u>Schmidt, et al., 2003</u>; <u>Dancet, et al., 2010</u>; <u>Mourad, et al., 2011</u>).</p>	<p>C</p>
<p>Fertility staff should be aware that patients value the provision of information about psychosocial care options (e.g., contact details of support groups, online support options, access to infertility counselling, or psychotherapy) (<u>Schmidt, et al., 2003</u>; <u>Cousineau, et al., 2008</u>; <u>Dancet, et al., 2010</u>; <u>Sexton, et al., 2010</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that IVF patients equally prefer in-person or telephone consultation to discuss their treatment results and future plans (<u>Stewart, et al., 2001</u>).</p>	<p>C</p>

Research recommendations

There are caveats to state in relation to the primary research on which the recommendations were based and in relation to the review process. The primary research lacks operational definitions and precision. Researchers should achieve greater consensus in what they mean by psychosocial care and try to progress research from general questions (do patients value information about treatment) to more specific questions (e.g., what type of information, in what format, delivered when). The use of theoretical frameworks in primary research could help achieve this goal. Primary research also needs to be using better ways of eliciting patient preferences, because almost all studies were excluded because of low-grade evidence methods.

1.2 Patients' well-being

Key question

WHICH CHARACTERISTICS OF FERTILITY STAFF AND CLINIC ARE ASSOCIATED WITH PATIENTS' WELL-BEING?

Rationale of the key question

This section provides a comprehensive view of the characteristics of fertility staff and/or clinics that are associated with the well-being of infertile patients. The aim is to identify specific aspects of care that enhance patients' well-being during fertility treatment so that these can be promoted at the clinics.

The emotional (anxiety, depression, quality of life, and (general and infertility-specific) stress), relational and social well-being of patients was considered. Patients' expressions of value and/or preferences about these care components are described in the previous two questions.

The first part of the question describes associations between fertility staff and clinic characteristics and patients' well-being. The specific staff characteristics included in this section were attitude of and relationship with staff, communication, patient involvement, and privacy and emotional support. The specific clinic characteristics considered were information, competence of clinic and staff, coordination and integration, accessibility, continuity and transition of care, and physical comfort ([Dancet, et al., 2010](#); [Dancet, et al., 2011](#)).

The second and third parts of this question describe associations between psychosocial interventions that can be delivered by all fertility staff and the well-being of patients. First, we will describe interpersonal interventions, which are delivered by fertility staff to one or more patients in an interactive context. Subsequently we will describe self-administered interventions which can be administered by the patients themselves and do not require feedback from or interaction with care providers specialized in psychosocial care.

1.2.a Fertility staff and clinic characteristics

This section describes associations between fertility staff and clinic characteristics and patients' well-being (emotional, relational, and social well-being, Table 1.1). The aim of investigating these associations is to reinforce specific staff and/or clinic characteristics that are expected to promote patient well-being.

Clinical evidence

In a cross-sectional observational survey with 427 women with fertility problems undergoing treatment at 29 different Dutch clinics, patients filled out self-report questionnaires on their experiences of patient-centred care (PCQ-Infertility), anxiety and depression, and quality of life ([Aarts, et al., 2012](#)). Although the PCQ-Infertility questionnaire assessed patients' experiences with almost all of the above enumerated staff and clinic characteristics (i.e., with the exception of physical comfort), only the total score of the tool was used in analysis.

Multilevel regression analyses showed that receiving patient-centred care was weakly associated with lower patient anxiety and depression, and higher quality of life, across all domains (emotional, mind-body, relational, and social).

Table 1.1. Associations between fertility staff and clinic characteristics and patients' emotional, relational, and social well-being

Studies	Characteristics investigated		Individual well-being			Relational well-being	Social well-being
	Staff	Clinic	Depression	Anxiety	Other		
(Aarts, et al., 2012) Cross-sectional survey	✓ (one total score)		-	-	Emotional QoL: + Mind-body QoL: +	Relational QoL: +	Social QoL: +
(Brucker and McKenry, 2004) Cross-sectional survey	✓		ns	-. ^a	Psycho-pathology -. ^a		
(Gameiro, et al., 2013) Cross-sectional survey	✓	✓	-	-		Relational QoL: +	

QoL: quality of life.

+ : positive association between staff and/or clinic characteristics and well-being measure.

- : negative association between staff and/or clinic characteristics and well-being measure.

ns: no significant association between staff and/or clinic characteristics and well-being measure.

^a: association only significant in subgroup of men (not in subgroup of women).

Blank cells indicate that associations were not assessed.

In another cross-sectional observational survey, Brucker and McKenry investigated whether perceived support from health professionals, defined as the extent to which an individual perceives that his/her needs for support, information, and feedback are fulfilled, was associated with patients' well-being ([Brucker and McKenry, 2004](#)). The response rate for this survey was very low, with only 72 women and 48 men (17.5% response rate) out of 686 invited patients participating. The authors adapted the Procidano and Heller's (1983) Perceived Social Support From Family, and Perceived Social Support From Friends instruments to build a 20-items measure assessing different types of perceived support from health professionals, including information/communication and emotional support (staff characteristics). General psychopathology, anxiety, and depression were also assessed. Results showed that men who perceived higher support from health professionals reported lower general psychopathology and anxiety. No significant associations were found for women. It should be noted, however,

that associations were tested separately for women and men without a previous test of the moderation effect of gender.

Gameiro and colleagues performed a cross-sectional observational survey with 322 female and 111 male fertility patients undergoing fertility diagnosis or treatment ([Gameiro, et al., 2013](#)). Patients filled out self-report questionnaires on their experiences of patient-centred care (PCQ-infertility, eight dimensions of care), anxiety, depression, and relational quality of life. Receiving more patient-centred care (PCC) in terms of communication, respect, competence, and information was weakly associated with less anxiety. Receiving more PCC in terms of the same dimensions and involvement was weakly associated with less depression. Furthermore, receiving more PCC in terms of communication, respect, involvement, competence, continuity, and information was weakly associated with better relational quality of life.

Conclusions and Considerations

The evidence presented suggests that positive staff and clinic characteristics are weakly associated with higher patient well-being. However, the cross-sectional design of the studies does not clarify if the higher patient well-being actually results from better care. Overall reliable conclusions about which specific staff and clinic characteristics are relevant for patients' well-being cannot yet be reached.

Most research focusing on the staff and clinic characteristics that may have an impact on patients' well-being is based on qualitative research. Qualitative research that was excluded due to being considered low-quality evidence suggests that all six staff characteristics and all four clinic characteristics have a positive impact on patients' well-being ([Becker and Nachtigall, 1991](#); [Blenner, 1992](#); [Orshan, et al., 2001](#); [Peters, 2003](#); [Peddie, et al., 2005](#); [Peddie, et al., 2006](#); [Redshaw, et al., 2007](#); [Williams, et al., 2010](#); [Sol Olafsdottir, et al., 2013](#)).

Recommendations

<p>Fertility staff should be aware that receiving patient-centred care is associated with better patient well-being (Aarts, et al., 2012; Gameiro, et al., 2013).</p>	<p>C</p>
<p>Fertility staff should be aware that positive staff characteristics (communication, respect, competence, involvement, and information) are associated with better patient well-being (Aarts, et al., 2012; Gameiro, et al., 2013).</p>	<p>C</p>
<p>Fertility staff should be aware that positive clinic characteristics (information, competence of clinic and staff, and continuity) are associated with better patient well-being (Aarts, et al., 2012; Gameiro, et al., 2013).</p>	<p>C</p>

1.2.b Psychosocial care components

Key question

WHICH INTERACTIVE AND SELF-ADMINISTERED INTERVENTIONS ARE ASSOCIATED WITH PATIENTS' WELL-BEING?

Rationale of the key question

The aim of identifying the interactive and self-administered interventions that are associated with patient well-being during their fertility care is for staff to integrate those interventions that have positive effects on patients' well-being into the daily routine care of their clinics.

1.2.b.1 Interactive interventions

Clinical evidence

This section provides a comprehensive description of the effects of interactive interventions (i.e., delivered to infertile patients in an interactive context) on patients' emotional, relational, and social well-being (Table 1.2).

Gürhan and colleagues performed a non-RCT to assess a nursing counselling programme implemented by two nurses and directed at female IVF patients ([Gürhan, et al., 2007](#)). The control and intervention groups did not differ at baseline. Depression was assessed on the day when ovarian stimulation was started and before embryo transfer. The programme included a 60-min group educational session, where information about the treatment and procedures was given and discussed, and two 20-min individual (or with partner present if indicated) interviews to evaluate and to meet coping needs. Within these interviews, participants were encouraged to talk about their feelings, concerns, psychosocial distress, and coping strategies. Relaxation techniques were also taught. In addition, support was provided by staying with the participants during the invasive procedures and participants were encouraged to use the relaxation techniques. The control group received standard care. The effect of this complex intervention on women's depression levels was evaluated and no significant effects were found. Depression levels of the control group also remained unaffected and difference in post-treatment depression did not differ between the two groups.

A nursing crisis intervention programme (IVF was considered the crisis) implemented by one nurse and directed at female IVF patients was assessed in an RCT ([Shu-Hsin, 2003](#)). The intervention and control groups did not differ at baseline. Anxiety, depression, and four infertility-specific subscales (self-image/self-esteem, guilt/blame, sexuality problems, and interpersonal relationship) were assessed at start of treatment, embryo transfer, and before taking the pregnancy test. The programme included several components: a video explaining the therapeutic process (30 min); self-instructional material on hypnosis and relaxation; a video on self-hypnosis and muscle relaxation (40-min); training together in a practice session; and individual cognitive-behavioural counselling (patients could express negative feelings, pressures, and psychosocial distress and counsellor provided support). Patients were encouraged to self-administer a relaxation technique whenever they felt nervous, but they did it on average twice a week, and cognitive-behavioural counselling was offered via telephone (1-2 times/week between the embryo transfer and the pregnancy test). The control

group received standard care that excluded all the components of the nursing crisis intervention programme. Although psychosocial responses changed across time in both groups, results from the RCT showed no effect of the complex intervention on patients' anxiety, depression, self-esteem, or guilt. No effects on the patients' relational well-being were found either, namely on their interpersonal relationship and sexuality problems.

Table 1.2. The effect of interactive interventions administered by fertility clinic staff on patients' individual and relational well-being

Intervention	Individual well-being			Relational well-being
	Depression	Anxiety	Other	
Nurse-led counselling programme (Gürhan, <i>et al.</i> , 2007) <i>Non-RCT</i>	ns			
Nurse-led crisis intervention programme (Shu-Hsin, 2003) <i>RCT</i>	ns	ns	<i>Self-image/self-esteem:</i> ns <i>Guilt/blame:</i> ns	<i>Interpersonal relationship:</i> ns <i>Sexuality problems:</i> ns
Nurse-led complex intervention (Mori, 2009) <i>RCT</i>	ns	ns		
Nurse-led complex intervention (Terzioglu, 2001) <i>Non-RCT</i>	+ ^a	+	<i>Life satisfaction:</i> +	
Embryologist-led complex intervention (van Zyl, <i>et al.</i> , 2005) <i>RCT</i>	ns	+		

+: positive effect of the interpersonal intervention on well-being measure.

ns: no significant effect of the interpersonal intervention on well-being measure.

^a: effect only significant for women (but not for men).

Blank cells indicate that the intervention was not tested for that well-being measure.

Mori conducted an RCT to evaluate an intervention implemented by a nurse and directed at female patients with primary infertility and without children, undergoing non-ART treatment ([Mori, 2009](#)). Anxiety and depression were assessed at study entry and after 1, 2, and 3 months (i.e., completion of the study; pregnant patients were excluded from analysis). The intervention included several components: a booklet entitled 'A guidebook for women facing the challenge of infertility: You are not alone – self-management against stress' and homework assignments that consisted of keeping personal logbooks (e.g., stress, relaxation, social support) which they submitted once a month to receive written feedback. The control condition consisted only of a booklet entitled 'A guidebook for women facing the challenge of infertility: You are not alone', which contained a shorter description of stress management compared with the intervention booklet. All patients received one email or telephone call a month to give them the opportunity to ask questions. The written feedback to the homework and the additional monthly call or email focused on acceptance, assurance, enforcements, stress control, cognitive assessment, stress responses, and social support. The groups did not differ in the incidence of anxiety and depression at 3 months. Changes across time in patients' anxiety and depression did not differ between groups. It should be noted that at baseline the intervention group reported higher anxiety than the control group and had done more inseminations instead of timing (with or without medication).

Terzioglu conducted a non-RCT to evaluate a complex intervention. The intervention was conducted by a nurse practitioner and targeted heterosexual couples with primary infertility undergoing their first IVF treatment ([Terzioglu, 2001](#)). Anxiety, depression, and life satisfaction were assessed at the beginning of the IVF procedure and at 4 to 5 days after embryo transfer (before the pregnancy test). The intervention included: deliverance of detailed procedural information, including written information on treatment procedures; possibility to ask questions and checks of patients' understanding; daily contact with patients between the start of ovulation induction and embryo transfer; help with any problem encountered; presence of the nurse practitioner at oocyte retrieval and embryo transfer; and finally, five counselling sessions (at start of ART, cycle day 21; at start of ovulation induction, cycles day 3 and 10; between oocyte retrieval and embryo transfer; after embryo transfer). The control condition included: general information about the procedures involved; the timetable for assisted reproductive treatment; and explanations about the need for blood and semen samples and the importance of dates and timing. Couples were subjected to standard care in all remaining aspects. The complex intervention showed to decrease women's (but not men's) depression, to decrease all patients' anxiety, and to increase women's (but not men's) life satisfaction between the start of the ART-procedure and 4 to 5 days after embryo transfer. No changes across time were observed for the control group. Differences in changes across time for both groups were not investigated. Baseline differences between the control and interventions group were not assessed (although descriptive statistics suggest the intervention group had higher anxiety than the control).

Van Zyl and colleagues conducted an RCT to assess a complex intervention that was delivered by an embryologist and targeted female IVF patients ([van Zyl, et al., 2005](#)). The groups did not differ at baseline (but differences in well-being were not tested). Anxiety and depression were assessed pre- and post-treatment. The intervention included: one session of additional emotional support based on non-directive counselling skills (respect, empathy, genuineness,

reflection, and interpretation); addressing patients' concerns about treatment (e.g., what is going to happen? what emotions to expect? how will I cope? who can I contact and when be updated?); a list of positive self-statements in coping; and daily phone calls from the embryologist early in the morning between oocyte retrieval and embryo transfer. The control group received standard care (no counselling or emotional support) and were asked to phone the gynaecologist daily concerning embryo development. The effects of this complex intervention on women's anxiety and depression were investigated and the positive effect on anxiety in the intervention group was significantly higher than the positive effect on anxiety in the control group, although post-assessments did not differ between both groups. It should be noted that it is unclear whether patients were aware of result of pregnancy test at the time of the second assessment and whether pregnancy rates differed between them.

Conclusions and considerations

The best evidence (RCTs) presented suggests that most evaluated interactive interventions that can be delivered by all fertility staff as not effective in promoting better patient well-being.

Overall, the interventions tested were quite complex, integrating different care components that were loosely defined. This makes it very difficult to test if any of the different components might be effective and which (due to positive effects being masked by neutral and/or negative ones). Complex interventions combine general information provision, continuity of care, opportunity to ask questions, being chaperoned, counselling about depression, and/or coping or relaxation.

It is unclear if any psychological/therapeutic theories and/or principles were employed in the delineation of the interventions. In the few cases where a specific therapeutic model was cited (e.g., cognitive behaviour therapy), it was not clear to which point this was followed by the researchers carrying out the intervention nor whether they had the specific expertise required to employ it with patients.

Recommendations

<p>Fertility staff should be aware that offering the currently available interactive complex interventions* is not likely to affect patient individual and relational well-being (Shu-Hsin, 2003; van Zyl, et al., 2005; Gürhan, et al., 2007; Mori, 2009).</p>	<p>B</p>
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**Complex interventions integrate several psychosocial components (e.g., information provision, training in coping, or relaxation strategies) (Craig, et al., 2008).*

1.2.b.2 Self-administered interventions

This section provides a comprehensive description of the effects of self-administered interventions (i.e., administered by the patients themselves) on patients' emotional, relational, and social well-being (summarized in Table 1.3)

Clinical evidence

Cousineau and colleagues conducted an RCT to assess an online psycho-educational support program for female fertility patients consulting fertility clinics ([Cousineau, et al., 2008](#)). The randomized groups did not differ at baseline. Infertility-specific stress (i.e., social concern, sexual concern, relationship concern, need for parenthood and rejection of childfree lifestyle, and global stress), self-efficacy, decisional conflict, and dyadic cohesion were assessed before (only for an ad-random half of each group) and after a 4-week period. The intervention group with pre-assessment received semi-structured feedback and advice on which parts of the online program to follow, by prioritizing issues for which lower self-efficacy was reported during the pre-assessment. Participants of the entire intervention group were asked to view the online program in two 45-min sessions or over several sittings over a 4-week period. The control group received standard care (no online program). Women who received the intervention reported decreases in global infertility-related stress, sexual and social concerns, and increased infertility self-efficacy, but these benefits were only observed in specific groups of women. In particular, women who spent more than 1 h using the program reported decreased global infertility-related stress and increased self-efficacy. No effects of the intervention were found on relationship concerns and dyadic cohesion. It should be noted that it is unclear whether some of the included women got pregnant during the study period and whether this influenced their assessments.

Matthiesen and colleagues performed an RCT to evaluate an expressive writing intervention for women and men (from hetero- or homosexual couples) undergoing their first IVF cycle ([Matthiesen, et al., 2012](#)). The randomized groups did not differ at baseline. Infertility-related stress was assessed pre- and twice post-intervention (respectively 3 and 6 weeks after writing, the latter was 1 week after ultrasound scan for clinical pregnancy). The intervention consisted of three 20-min expressive writing tasks conducted over a 3-day period. Participants were instructed to write about their deepest feelings and thoughts in relation to: involuntary childlessness (first day); IVF/ICSI-treatment for infertility (second day); and positive thoughts and feelings experienced in relation to their involuntary childlessness (third day). The control condition consisted of three 20-min writing tasks conducted over a 3-day period. Participants were instructed to write in an emotionally neutral manner about: their previous day's activities (first day); their previous 5 days' (second day); and scheduled/planned activities for the following 5 days (third day). The results showed that the intervention decreased infertility-related stress 3 weeks after the intervention, but this effect disappeared 6 weeks after the intervention. Separate gender analysis revealed the same pattern for women but no changes across time for men. It should be noted that the influence of becoming pregnant during the study period was not assessed.

Table 1.3. The effect of self-administered interventions on patients' individual, relational, and social well-being

Intervention/study	Individual well-being					Relational well-being	Social well-being
	Depression	Anxiety	General stress	Infertility specific stress	Other		
Tailored online psycho-educational intervention (Cousineau, et al., 2008) RCT				+ ^{b,h} - ^g	Infertility self-efficacy: + ^{b,c,f,h}	Sexual concerns : + ^{a,c,d,f,g} Relationship concerns: ns Dyadic cohesion: ns	Social concerns: + ^{e,f}
Expressive writing intervention (Matthiesen, et al., 2012) RCT				+	Negative mood: ns Positive mood: ns		
Expressive writing intervention (Panagopoulou, et al., 2009) RCT			ns	ns			
Information leaflet (Pook and Krause, 2005) RCT				+			
Information focusing on (1) emotion and sex, (2) emotion, (3) procedures (Takefman, et al., 1990) RCT	ns	ns			Feelings about infertility + (only 3) Negative emotional reactions - (only 1)	Sexual functioning: ns Marital adjustment: ns	
Online personal health record (Tuil, et al., 2007) RCT	ns	ns			General self-efficacy ns		Social support ns

-: negative effect of the intervention on well-being measure.

+: positive effect of the intervention on well-being measure.

ns: no significant effect of the intervention on well-being.

^a: effect only significant for women with high anxiety at the start of the intervention.

^b: effect only significant for women with high income.

^c: effect only significant in women with explained fertility factor.

^d: effect only significant in women with high treatment frequency (i.e., more than 4 treatment cycles).

^e: effect only significant in women with high escape-avoidance coping at the start of the intervention.

^f: effect only significant in women with low problem-solving coping at the start of the intervention.

^g: effect only significant in women with high distancing coping at the start of the intervention.

^h: effect only significant in women that used the program for more than 1 h.

In an RCT, an expressive writing intervention for women undergoing IVF treatment was assessed (Panagopoulou, *et al.*, 2009). The intervention and control groups did not differ at baseline. A 1-week-long intervention was delivered after the embryo transfer. General stress and infertility-specific stress were assessed pre- (i.e., on the day of the embryo transfer) and post-intervention (i.e., 2 days prior to the pregnancy test). In the intervention group, patients were given personal diaries together with written instructions to write, for 20 min a day during 1 week, 'about your deepest thoughts and feelings regarding the infertility and its treatment'. In the control writing condition group, patients were given personal diaries together with written instructions to write, for 20 min a day during 1 week, about the 'facts concerning the infertility and its treatment'. Women in the control (non-writing condition) group received standard medical instructions and went home. The results revealed that general and infertility-specific stress increased significantly in all groups but that there was no difference between the intervention and control conditions (after controlling for baseline values) in post-assessments of general and infertility-specific stress. Regrettably, exact *p*-values for certain tests were not reported.

Pook and Krause conducted an RCT to assess an intervention based on an information leaflet for infertile men starting infertility diagnosis (Pook and Krause, 2005). Infertility-specific stress was assessed upon arrival at the clinic, before the fertility examination. The randomized groups did not differ at baseline (but differences in infertility-specific stress were not tested). In the intervention group, an information leaflet was sent by mail at the time of making an appointment for a fertility evaluation. The leaflet explained what would happen during the appointment and included: information about the contents and sequence of the different components of the fertility workup; questions that would be asked by the physician; detailed description of the medical examinations; reassurance that no test more invasive than a blood sample would be performed during the consultation; information on sensory aspects; and a description of the room for sperm sample preparation (separate, no time pressure, clean, fears for not being able to produce were addressed). The control group did not receive the leaflet. The results showed that men who received the leaflet reported lower infertility-related stress when they attended the clinic.

In another RCT, different information interventions for primary infertile couples starting the infertility diagnostic phase were tested (couples who achieved pregnancy during the study were excluded) (Takefman, *et al.*, 1990). Marital adjustment, intercourse frequency, anxiety, and infertility emotional impact were assessed before and after the diagnostic phase. Three intervention conditions were compared, based on the type of information delivered. The first intervention provided: emotional and sexual information and included a specification of the rationale for providing information (i.e., might prepare patients to cope better); a 15min video about the medical procedures and emotional aspects of fertility treatment; and a 15-page booklet with sexual information (information about the sexual impact of treatment and tips in case of developing difficulties). The second intervention provided emotional information and included: a specification of the rationale for providing information (i.e., might prepare patients to cope better); and a 15-min video about the medical procedures and emotional aspects of fertility treatment. The booklet containing sexual information was not included. Finally, the third intervention provided procedural information and included: a specification of the rationale for providing information (i.e., might prepare patients to cope better); and a

12-min video focusing only on the medical procedures. Results showed that the procedural information intervention resulted in a decrease of patients' negative feelings about infertility, whereas it remained stable in the other two intervention groups. In addition, it was observed that compared with the other groups, emotional reactions to undergoing the hysterosalpingogram of women were worse in the group having received the emotional and sexual information interventions. Marital adjustment and intercourse frequency decreased equally in all groups. Anxiety increased equally in all three groups. It should be noted that the three groups were not compared at baseline.

Tuil and colleagues performed an RCT to test an intervention based on providing male and female IVF patients, experiencing a first IVF cycle in the studied clinic, with access to an internet-based personal health record (Tuil, *et al.*, 2007). The two groups did not differ at baseline. Anxiety, depression, self-efficacy, and social support were assessed before and after the intervention. The online personal health record included: general information about infertility, the IVF treatment, and the fertility clinic; personalized information, by giving access to the patients' own medical records; and communication options such as email facilities, a discussion forum, and a chat room with other patients' and physicians' participation, answers and corrections. The control group did not receive access to their online personal health record. It was found that having access to an online personal health record did not have any effect on patients' anxiety, depression, general self-efficacy, or social support.

Conclusions and considerations

The evidence presented suggests that self-administered interventions can help patients to cope with specific treatment-related issues. A one-page information leaflet showed to reduce infertility-related stress for men undergoing infertility evaluation. Providing procedural information about demanding and intrusive treatment procedures prior to patients undergoing them can be beneficial. Results concerning expressive writing interventions are mixed.

Providing tailored support for patients may also be beneficial but this needs to be further researched, as results show that the intervention effect varies according to patient profile and can even be detrimental (as shown for patients who used high distancing coping). The study of Cousineau and colleagues presented a complex intervention and this makes it harder to interpret results, as patients were guided/advised about the type of support that best fitted their needs but did not necessarily follow that advice. Nonetheless, it is worth noting that patients who used the support program for more than 1 h reported lower distress and higher self-efficacy about infertility.

Overall the interventions lacked clarity about the underlying psychological/therapeutic theories and/or principles employed, but were more explicit about the procedures implemented (what, when, and by whom).

Recommendations

Fertility staff should provide preparatory information about diagnostic procedures because it decreases infertility-specific anxiety and stress (Pook and Krause, 2005).	C
Fertility staff should be aware that tailored online psycho-educational interventions may improve infertility-specific stress and self-efficacy, and the sexual and social concerns of particular groups of patients (Cousineau, et al., 2008).	C
Fertility staff should be aware that providing IVF patients with access to an internet-based personal health record is not likely to promote their emotional well-being (depression, anxiety, and self-efficacy) (Tuil, et al., 2007).	C

Research recommendations

There is a large body of qualitative research about the staff and clinic characteristics that affect patients' well-being. This research base can be used for the delineation of working hypotheses to be tested through quantitative research about which staff and clinics characteristics are important at which specific moments of the patients' treatment pathway. These hypotheses need to be operationalized in clearly defined staff behaviours and/or skills (e.g., include partner in all consultations) and clinic characteristics (e.g., provide written information). In addition, researchers need to specify which specific dimensions of patients' well-being are expected to be affected and these need to be assessed with gold standards and/or equivalent validated questionnaires.

Several limitations were noted to the studies investigating the efficacy of interpersonal and self-administered interventions. These limitations compromise the replication of the research presented and do not clarify which specific care components should be evaluated in future research. Therefore, it is advised that future research tests simple interventions based on one single care component. Researchers need to make clear why and how (therapeutic principle), when (specific moment in routine care), and by whom this care component should be delivered to patients. In addition, they need to test well-defined hypotheses about which dimensions of patient well-being are expected to be affected (which outcomes to measure) and when (assessment times). This does not mean that complex interventions cannot be implemented and delivered to patients, but they need to be based on components whose effectiveness has already been proven.

Although not considered in the present section, researchers should also evaluate the feasibility of the interventions and staff compliance with them. It is not only important to understand whether the interventions are efficient, but also whether staff can implement them and actually do. Differentiating these aspects will allow for a better design of the interventions, either by rejecting inefficient care components or by changing the way they can

be feasibly implemented by staff. For self-administered interventions, user acceptability also needs to be investigated.

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2. PSYCHOSOCIAL CARE OF PATIENTS BEFORE TREATMENT

Introduction

The pre-treatment period refers to the period from the first visit to the clinic to the start of the first treatment cycle (until the 5th day of ovarian stimulation). Therefore, this period includes the first appointment at the clinic, workup and diagnosis of infertility, and the waiting period before starting treatment.

2.1 Needs of patients before treatment

Key question

WHAT ARE THE NEEDS OF PATIENTS BEFORE TREATMENT?

Rationale of the key question

This question describes the needs of patients before the start of any type of fertility treatment.

The goal is to increase staff awareness about the needs of patients specific to the pre-treatment period (i.e., diagnosis, waiting period to start treatment).

2.1.a Behavioural needs

The available evidence about patients' behavioural needs refers to compliance with treatment and to lifestyle behaviour (including sexual behaviour).

Clinical evidence

Compliance with treatment

Non-compliance with fertility treatment via premature discontinuation refers to when patients decide to opt out of (further) treatment despite a favourable prognosis.

The rates of non-compliance with treatment due to premature discontinuation across all treatment stages were only described in a longitudinal cohort study ([Brandes, et al., 2009](#)). In this study, 1391 couples were referred to the infertility clinic and 319 discontinued before achieving pregnancy. Of these couples, 131 (41.1%) discontinued before any stage of treatment was started. This means that from the initial 1347 couples (44 lost to follow-up), 9.7% discontinued before starting treatment.

A systematic review investigated patient stated reasons for non-compliance with fertility treatment via premature discontinuation ([Gameiro, et al., 2012](#)). The review included 22 studies from eight countries that reported on more than 21 000 patients. The authors identified five stages in infertility treatment, of which two will be reported here: during diagnosis and before initiation of treatment, and while on the waiting list to start ART.

Patients' five most selected reasons for discontinuation during diagnosis and before initiation of treatment (based on two studies) were rejection of treatment (due to ethical objections, concerns about, and lack of interest in treatment, 42.3%), personal reasons (26.9%), relational problems (20.1%), financial issues (15.3%), and psychological burden of treatment (10.3%). Patients' five most selected reasons for discontinuation while on the waiting list to start ART (based on one study) were relational problems (18.5%), psychological burden of treatment (12.9%), personal reasons (11.1%), organizational problems (5.5%), and financial issues (3.7%).

Lifestyle behaviour

One cross-sectional study investigated 110 women and 100 men undergoing infertility workup (Schilling, *et al.*, 2012). Results showed 9.1% of the women and 3% of the men were classified as practising sexual behaviour not optimizing probability for conception, including failure to take advantage of the woman's fertile days on 4-6 occasions over the past 6 months and/or one partner having a sexual disorder. In addition, 7.3% of the women were classified as underweight (body mass index (BMI) < 18.5) and half of these indicated a (pre-) clinical anorexia nervosa in the medical records; 26.9% of the women and 55.6% of the men were overweight (BMI \geq 25). Of the women with normal or low BMI, 19.9% practised sport on average 4.4 h per week. Cigarette smoking (more than five cigarettes a day) was reported by 10.9% of the women and 18.4% of the men, and 2% of the men indicated that they were taking anabolic steroids regularly.

In the prospective observational study by Klonoff-Cohen and colleagues, five questionnaires on smoking behaviour were distributed to couples (221 women and 166 men) during different stages of treatment, including two questionnaires at the initial clinic visit (Klonoff-Cohen, *et al.*, 2001); 15% of the couples undergoing IVF or gamete intra-fallopian transfer (GIFT) reported smoking the year before, whereas 11% reported smoking the month before, and 8% smoked up to the day of the procedure.

Freizinger and colleagues conducted a cross-sectional descriptive study to estimate the prevalence of eating disorders in 82 infertile women beginning their first IUI treatment (Freizinger, *et al.*, 2010). Self-report measures were used to assess eating disorder pathology and exercise habits (Structured Clinical Interview for DSM-IV Axis I Disorders Module H, Brief Demographic Form, and EDE-Q adapted from the Eating Disorder Examination); 17 women (20.7%) met criteria for a past or current eating disorder.

Conclusion and considerations

Of patients that are referred to fertility clinics, 10% do not start treatment for several reasons. A significant proportion of patients have lifestyle behaviours that are not optimal for conception (smoking, excessive exercise, diet that results in unhealthy BMI, the use of anabolic steroids). Low or non-reported response rates make the generalizability of the findings questionable (not stated in Klonoff-Cohen, *et al.*, 2001; 67% in Schilling, *et al.*, 2012). It should also be considered that the data were self-reported and therefore may be underreported due to social desirability. The actual rates may be higher. Overall, these data suggest that patients starting treatment do not behave optimally to maximize their chances of conception.

Recommendations

<p>Fertility staff should be aware that one in 10 patients referred for fertility treatment chooses not to start treatment (<u>Brandes, et al., 2009</u>).</p>	<p>C</p>
<p>Fertility staff should be aware that the reasons patients state for not starting any type of recommended fertility treatment are:</p> <ul style="list-style-type: none"> • rejection of treatment (due to ethical objections, concerns about and lack of interest in treatment) • personal reasons • relational problems • financial issues • psychological burden of treatment (<u>Gameiro, et al., 2012</u>). 	<p>B</p>
<p>Fertility staff should be aware that the reasons patients on the waiting list to start ART treatment state for not starting recommended ART treatment are:</p> <ul style="list-style-type: none"> • relational problems • psychological burden of treatment • personal reasons • clinic-related problems • financial issues (<u>Gameiro, et al., 2012</u>). 	<p>B</p>
<p>Fertility staff should be aware that a considerable number of patients have lifestyle behaviours that may negatively affect their general and reproductive health (<u>Klonoff-Cohen, et al., 2001</u>; <u>Freizinger, et al., 2010</u>; <u>Schilling, et al., 2012</u>).</p>	<p>C</p>

2.1.b Relational and social needs

The available evidence about patients’ relational needs refers to marital/relational satisfaction and sexual relationship. No evidence was found regarding the social needs of patients.

Clinical evidence

Marital/relational satisfaction

Slade and colleagues studied 144 couples in their prospective longitudinal study, with a set of questionnaires including the Dyadic Adjustment Scale (DAS) (response rate 98%) (Slade, et al., 1997). Baseline measurement was on day 1 of the first cycle of IVF treatment. Women’s overall scores of adjustment were lower than normal values, but this difference was not found for men. When the DAS subscales were investigated individually, no differences from norms were found for the satisfaction scale, but both women and men presented lower consensus (to what extent the partners are perceived

to play equal roles in domestic and social decisions) and higher cohesion (the degree to which interests and experiences are shared) than normal values for married couples.

Another prospective cohort study did not find this difference on the DAS questionnaire between infertile individuals and norms in 116 women and 107 men attending an infertility clinic (Edelmann and Connolly, 2000).

In the prospective longitudinal study by Verhaak and colleagues, with the aim of predicting emotional response to unsuccessful fertility treatment, pre-treatment marital and sexual satisfaction were reported. Before the start of the first IVF/ICSI treatment cycle (5-10 days), 187 women showed no difference in marital satisfaction compared with norms (measured with the general marital satisfaction scale from the Maudsley Marital Questionnaire - MMQ) (Verhaak, *et al.*, 2005).

Sexual relationship

In a prospective cross-sectional study conducted by Peterson and colleagues assessing 306 women and 295 men starting IVF or IUI, 17% of the women and 21% of the men reported high levels of sexual infertility stress (i.e., scores of the Fertility Problems Inventory one standard deviation (SD) above the mean of the COMPI sample) (Peterson, *et al.*, 2007).

In the study of Slade and colleagues, the levels on the subscale scores (dissatisfaction, non-sensuality, infrequency, non-communication, and avoidance) of the Golombok–Rust Inventory of Sexual Satisfaction (GRIS) did not appear to be indicative of psychosexual problems (Slade, *et al.*, 1997).

In the cross-sectional study of Verhaak and colleagues on 207 women entering their first treatment cycle of IVF or ICSI, no differences from the normal values of the MMQ scale on sexual satisfaction could be found for the women investigated (Verhaak, *et al.*, 2001).

In the prospective longitudinal study by the same group assessing patients 5-10 days before the start of the first IVF/ICSI treatment cycle, women showed no difference in sexual satisfaction compared with norms (measured with the sexual satisfaction scale from the MMQ) (Verhaak, *et al.*, 2005).

Sexual function

In the cross-sectional study of Shindel and colleagues studying 121 couples before infertility treatment, 18% of the males had mild erectile dysfunction and 4% had moderate erectile dysfunction (Shindel, *et al.*, 2008). These prevalences are not higher than those observed in the general population (Laumann, *et al.*, 1999; Moreira, *et al.*, 2005).

Conclusion and considerations

There is no compelling evidence that the marital relationship of infertile patients starting treatment differs from that of the general population. The available evidence about the sexual relationship shows that this does not seem to be affected at the start of treatment. Prevalence rates of sexual dysfunctions do not seem to be elevated compared with the general population.

Overall, there seems to be little knowledge about the relational and social needs of patients before they start treatment. These needs may differ according to patients' cultural, ethnic, and religious background but evidence about this is non-existent.

Recommendations

Fertility staff should be aware that patients starting first-line or ART treatments do not have worse marital and sexual relationships than the general population (Slade, <i>et al.</i>, 1997; Edelmann and Connolly, 2000; Verhaak, <i>et al.</i>, 2001; Verhaak, <i>et al.</i>, 2005).	B
Fertility staff should be aware that patients in fertility workup do not present higher prevalence rates of sexual dysfunctions than the general population (Shindel, <i>et al.</i>, 2008).	C

2.1.c Emotional needs

The available evidence about patients' emotional needs refers to depression, anxiety, psychopathology, psychiatric disorders, and general well-being.

Clinical evidence

Depressive symptoms

A systematic review conducted by Verhaak and colleagues provided an overview of how women adjust emotionally to the various stages of IVF treatment in terms of anxiety, depression, or general distress (Verhaak, *et al.*, 2007). Emotional adjustment before the start of fertility treatment was reported in nine studies, of which six provided information about pre-treatment depression levels using different inventories (Beck Depression Inventory (BDI), Symptom Checklist (SCL-90), Centre for Epidemiologic Studies Depression Scale (CES-D), or Profile of Mood States (POMS)). None of the studies reported differences in depression between women starting IVF and norm groups.

Recent studies have confirmed this observation. In a multicentre prospective cohort study investigating the impact of psychological distress on the IVF treatment outcome (cancellation and pregnancy rates), Lintsen and colleagues found no differences in the values of the depression inventory in 783 women when joining the waiting list (i.e., 1-2 months before treatment) (BDI-PC), compared with normal values (Lintsen, *et al.*, 2009). Lewis and colleagues reported a lower incidence of major depressive disorders in 321 women preparing to undergo first IVF treatment compared with a historical control group (Patient Health Questionnaire primary care version (PHQ-9)) (Lewis, *et al.*, 2013).

Other studies have reported on depression in women and men starting fertility treatment, without comparing with a norm group (de Klerk, *et al.*, 2008). In an RCT on standard versus mild stimulation protocols, de Klerk and co-workers found no indicators for pre-treatment depression in 289 women (of 391 women recruited) on the day of IVF planning consultation, as mean scores in the Hospital Anxiety and Depression Scale (HADS) were all in the low to moderate range.

Khademi and colleagues found that 31% of 350 Iranian women showed mild depression and 8% moderate (BDI > 32) to severe (BDI > 47) depression on the BDI scores before their first IVF/ICSI (Khademi, *et al.*, 2005). Eight women were excluded because of BDI scores > 47 indicating severe depression demanding psychiatric consultation.

Hakim and colleagues found that 10% of 83 women and 3% of 83 men showed elevated symptoms of depression (HADS scores > 7; indicative of a possible depressive disorder) before they started IUI (Hakim, *et al.*, 2012). Only 3% of women and none of the men had a score > 11 (indicative of a probable depressive disorder).

Assessing depression in male partners of infertile couples, Kumbak and colleagues found no indication of clinical depression in 120 men in a cross-sectional survey before infertility treatment (referred for first IVF) (BDI) (Kumbak, *et al.*, 2010). In contrast, Shindel *et al.* found that depression (measured with the CES-D) is prevalent among male partners of infertile couples presenting for the evaluation of infertility (before diagnosis): 11% of 121 men reported moderate and 12% reported severe depression scores, respectively (Shindel, *et al.*, 2008).

Anxiety

In the same systematic review by Verhaak, all nine studies also assessed anxiety, using the Spielberger State in Trait Anxiety Inventory (STAI) or the Symptom Checklist (SCL-90) (Verhaak, *et al.*, 2007). With respect to state anxiety, four studies did not report differences between women starting IVF and norm groups, whereas five showed enhanced pre-treatment levels of state anxiety. The reviewers did not find a difference in study characteristics that could explain these contradictory findings. Trait anxiety was not evaluated in this review.

Lintsen and colleagues found no difference in state and trait anxiety in 783 Dutch women before the start of IVF or ICSI treatment, compared with norms (STAI) (Lintsen, *et al.*, 2009).

Lykeridou and co-workers found higher scores of state and trait anxiety in 404 Greek women before IVF treatment (STAI) compared with published normative scores (Lintsen, *et al.*, 2009; Lykeridou, *et al.*, 2009); i.e., the mean score of participants' state anxiety was 44.5 (SD 9.5) and trait anxiety was 41.8 (SD 7.1), compared with normative scores of 35.2 and 34.8, respectively.

Kumbak and colleagues reported higher state anxiety than the norms in 120 male partners of couples referred for fertility treatment, whereas trait anxiety was not elevated (STAI and the Spielberger State-Trait Anger Expression Inventory (STAXI)) (Kumbak, *et al.*, 2010).

Other studies reported levels of anxiety in couples before the start of fertility treatment without comparing with normal values. De Klerk and co-workers found no indicators for anxiety disorders in 289 women before they started IVF treatment (HADS) (de Klerk, *et al.*, 2008). Hakim and colleagues reported elevated symptoms of anxiety indicative of a probable anxiety disorder in 15% of 83 women and 6% of 83 men before they started IUI in Canada (HADS) (Hakim, *et al.*, 2012).

In a recent cross-sectional study, anxiety levels (STAI) were measured in 29 women undergoing an initial IVF cycle and 15 women entering a repeat IVF cycle (Turner, *et al.*, 2013). Baseline measurement before the start of ovarian stimulation showed elevated STAI-State and STAI-Trait scores for the whole group compared with the normative population.

Psychopathology

Van den Broeck and colleagues reported no clinically significant differences in general psychopathology (measured with the Brief Symptom Inventory, BSI) in 106 women and 102 men before the start of their first IVF/ICSI treatment, compared with the published norms for the general Dutch population (Van den Broeck, *et al.*, 2010).

Edelmann and Connolly investigated in their prospective cohort study two samples of infertile couples: 116 women and 107 men attending an infertility clinic and 152 couples who were consecutive referrals to an IVF clinic (Edelmann and Connolly, 2000). They assessed general psychopathology with the General Health Questionnaire (GHQ) and found no differences for women or men in relation to normative scores.

During pre-treatment evaluation in the study of Salvatore and colleagues, the level of psychological distress was similar in 101 infertile women and 75 routine-care gynaecology controls, as demonstrated by the total score of the GHQ-30 (Salvatore, *et al.*, 2001).

In a cross-sectional study, the psychopathological symptoms of 149 women with infertility, 136 women with chronic pain, 22 women undergoing cardiac rehabilitation, 93 women with cancer, 77 women with hypertension, and 11 women with HIV-positive status were investigated using the SCL-90 (Domar, *et al.*, 1993). All groups were enrolling in a behavioural group treatment programme and the response rate was not stated for any of the groups. The infertile women had global symptom sum scores equivalent to the cancer, cardiac rehabilitation, and hypertension patients, but significantly lower scores than the chronic pain and HIV-positive patients.

Psychiatric disorders

Dhaliwal and co-workers measured the psychiatric symptoms of 120 Indian infertile couples with the Present State Examination (PSE) and found that these do not constitute a psychiatric population (Dhaliwal, *et al.*, 2004).

Salvatore and colleagues compared 101 women before IVF with 75 routine-care gynaecology patients who were not undergoing any form of fertility treatment, and found no significant differences in the Personality Disorders Questionnaire (PDQ-R) which assesses the prevalence of personality traits and disorders according to DSM III-R criteria (Salvatore, *et al.*, 2001). The profiles on the Minnesota Multiphasic Inventory (MMPI) indicated that there were no abnormal symptomatic aspects or personality dimensions exhibited by infertile women in comparison with the routine-care patients.

Recently, Zaig and colleagues used the Structured Clinical Interview for DSM-IV Axis I disorders (SCID) to measure psychopathology in 108 Israeli women before ovarian stimulation, entering their first or second IVF cycle (Zaig, *et al.*, 2013). A total of 21 women (19.4%) were diagnosed as suffering from a lifetime Axis I unipolar mood or anxiety disorder (10 with a mood disorder, 10 with an anxiety disorder, and 1 with both major depressive disorder and generalized anxiety disorder).

General well-being

Dhaliwal and colleagues measured well-being with the Subjective Well-Being scale (PSE) in their study with 120 Indian infertile couples, and found that men scored significantly lower compared with normal values whereas women's scores did not differ from normal values (Dhaliwal, *et al.*, 2004).

Conclusion and considerations

The reviewed evidence shows that before fertility treatment patients are not a psychiatric population. They do not present psychopathological symptoms nor psychiatric disorders. Similarly, their depression levels do not seem to differ from population norms. However, evidence regarding state anxiety is inconsistent and it is not clear if these inconsistencies are related to cultural issues. It may be that infertile patients with a strong pronatalist cultural background may show higher depression and/or anxiety and lower general well-being before the start of treatment (Dhaliwal, et al., 2004; Khademi, et al., 2005; Kumbak, et al., 2010; Turner, et al., 2013).

Recommendations

<p>Fertility staff should be aware that before the start of IVF treatment, patients are not more depressed than the general population or matched controls (<u>Verhaak, et al., 2007; Lintsen, et al., 2009; Lewis, et al., 2013</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that evidence about whether before the start of a first IVF cycle patients are more anxious (state and trait anxiety) than the general population is inconsistent (<u>Verhaak, et al., 2007; Lintsen, et al., 2009; Lykeridou, et al., 2009; Kumbak, et al., 2010; Turner, et al., 2013</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that before first-line or ART treatment, women do not show more psychiatric disorders or general psychopathology than the general population (<u>Edelmann and Connolly, 2000; Salvatore, et al., 2001; Dhaliwal, et al., 2004; Van den Broeck, et al., 2010; Zaig, et al., 2013</u>).</p>	<p>C</p>

2.1.d Cognitive needs

Clinical evidence

The available evidence about patients’ cognitive needs refers to preconception health awareness.

Preconception health awareness was assessed in 400 infertile women who presented for initial assessment to an infertility clinic prior to the first physician consultation (Vause, et al., 2009). Responses were variable over the several knowledge areas addressed in the survey. The majority of women recognized the importance of health optimization before and during pregnancy, infectious disease screening, consumption of folic acid, and discussion of prescription and non-prescription medications with their doctor prior to pregnancy and were aware of the risks of partner abuse, smoking, and recreational drug use. Women tended to be less well informed about the risks of alcohol use, contact with cat litter, and eating mercury-containing fish during pregnancy, and the effect of the age of the mother, family history, and immunizations on the pregnancy outcome. In general,

preconception knowledge was similar to a historical control group of 500 women seen in a private family practice.

Conclusion and considerations

Overall, there is limited knowledge about the cognitive needs of patients before the start of treatment. One study showed that infertile women presenting for treatment are not well informed of the detrimental effect of age and alcohol on pregnancy outcome.

Recommendations

None.

Research recommendations

The existing primary research has some limitations. Studies' response rates were between 32% and 98% (mean ~ 50%). Study groups were often heterogeneous, e.g. couples before IUI or IVF, or couples before the first ART cycle or before a subsequent ART cycle. Assessment measures were often heterogeneous too, consisting of mixtures of standardized and 'home-made' questionnaires and/or interviews. Differences in questionnaire scores against the norms were often not tested for statistical or even clinical significance (e.g., effect sizes).

Most of the studies on the need of couples before ART are from the 1990s (or earlier), so these results have to be replicated in more recent studies (on the background of new ART). In addition, only a few studies focused on patients starting first-line treatment and more information is needed about these patients' needs. Finally, no information exists on the cognitive needs of patients before treatment.

Future research should focus on providing a more complete picture of the psychosocial needs of patients before treatment, in particular about their relational, social, and cognitive needs. Future studies should ensure large and homogeneous samples and high response rates, and should use methods to control for patients' social desirability, particularly in what concerns lifestyle behaviour assessment. As women and men from different ethnic, religious, societal, and cultural backgrounds may have different psychosocial needs before starting infertility treatment, these moderating factors should be clearly assessed and documented in the studies, and appropriate subgroup analyses should be carried out.

2.2 Detection of needs before treatment

Key question

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS BEFORE TREATMENT?

This question describes the predictors of the needs patients express before the start of fertility treatment, and the tools fertility staff can use to detect those needs. The goal is to enable staff to identify in advance those patients that are more likely to have specific needs before starting treatment and who may therefore benefit from additional psychosocial support.

General recommendations

The guideline development group recommends that fertility staff offer patients the opportunity to have their needs assessed and be informed about their emotional adjustment before the start of treatment.	GPP
The guideline development group recommends that fertility staff use the tools listed in Appendix 2 when assessing patients' needs.	GPP

2.2.a Behavioural needs

The available evidence for patients' behavioural needs refers to treatment compliance and lifestyle behaviour.

Clinical evidence

Treatment compliance

Non-compliance with fertility treatment via premature discontinuation refers to when patients decide to opt out of (further) treatment despite a favourable prognosis.

A systematic review investigated patients' stated reasons for non-compliance with fertility treatment via premature discontinuation, as summarized in the section 2.1, but also included pre-treatment psychosocial predictors for not initiating treatment (*Gameiro, et al., 2012*). The review included 22 studies from eight countries that reported on more than 21 000 patients. The authors identified five stages in infertility treatment, of which two will be reported here: during diagnosis and before initiation of treatment; and while on the waiting list to start ART. For the latter period, the reviewers did not find any studies on predictors for treatment discontinuation. Predictors of premature discontinuation during diagnosis and before the initiation of treatment were only assessed in one study, which reported that women's age and depression were associated with higher discontinuation of treatment, whereas women's higher education level was associated with lower discontinuation. Other patient-related predictors, including men's age and education, financial issues, ethnicity, religion, and women's anxiety, were not associated with discontinuation. None of the treatment-related predictors assessed (parity, infertility duration, male factor, female factor, or unexplained diagnosis) were significantly associated with discontinuation during diagnosis or before initiation of treatment.

Lifestyle behaviour

In an observational cohort study, Landkroon and colleagues aimed to validate a self-administered online questionnaire for preconception risk assessment of lifestyle factors: smoking, alcohol consumption, and dietary items, in addition to medical and obstetric history (Landkroon, *et al.*, 2010). The study found good agreement between the online preconception questionnaire and history-taking at the consultation by trained interviewers for the lifestyle variables smoking, alcohol use, and dietary items (kappa statistics for tobacco use 0.91; dietary items 0.50 to 1.00; alcohol use 0.79). Low agreement was found for the use of drugs (kappa statistics 0.21). Medical and obstetric history also had good levels of agreement (kappa statistics > 0.70). The majority of women considered that the online questionnaire was an efficient and clear screening instrument.

Freizinger and colleagues conducted a cross-sectional descriptive study to estimate the prevalence of eating disorders in 82 infertile women beginning their first IUI treatment (Freizinger, *et al.*, 2010). Self-report measures were used to assess eating disorder pathology and exercise habits (Structured Clinical Interview for DSM-IV Axis I Disorders Module H, Brief Demographic Form, and EDE-Q adapted from the Eating Disorder Examination). There were no significant differences in any of the demographic or infertility characteristics or lifestyle behaviours (exercise, alcohol use, and smoking between women with or without a (past or current) eating disorder). The majority of women (76.4%) reported during the interview that they did not disclose their eating disorder history or current eating disorder to their infertility healthcare provider; the remainder (23.6%) did not answer to the question.

Conclusion and considerations

Evidence from a systematic review on treatment discontinuation shows that being older, more depressed, and less educated were associated with a higher likelihood of discontinuing treatment. However, these results are based on a single study, therefore it can be concluded that there is insufficient information on how to identify patients that will not start recommended fertility treatment. A number of potential risk factors (smoking, alcohol, and dietary items medical history) in the preconception period can be assessed or screened for with validated instruments. Additional history-taking by trained professionals may be adequate to verify certain areas of risk such as the partner's family history, the use of drugs, and certain medical risk factors for adverse pregnancy outcomes. However, the literature suggests that patients do not necessarily disclose potential risk factors to their infertility healthcare provider.

Recommendations

Fertility staff should be aware that currently there are no reliable pre-treatment tools or predictors to identify patients who are not likely to start recommended fertility treatment (Gameiro, <i>et al.</i>, 2012).	B
Fertility staff should not assume that patients fully self-report on risk factors for reduced fertility (e.g., eating disorders) (Freizinger, <i>et al.</i>, 2010).	C

<p>Fertility staff should be aware that risk factors (e.g., smoking, alcohol use, and diet) for reduced fertility can be assessed with self-administered online tools(Landkroon, <i>et al.</i>, 2010).</p>	<p>C</p>
<p>The guideline development group recommends that fertility staff consider explicitly screening risk factors (e.g., drug use, eating disorders) for reduced fertility (Freizinger, <i>et al.</i>, 2010).</p>	<p>GPP</p>

2.2.b Relational and social needs

The available evidence concerning the relational needs of patients before treatment refers to marital/relationship satisfaction, relational stress and concerns, and sexual relationship. Evidence about social needs included social stress.

Clinical evidence

Marital/relational satisfaction

Several characteristics of the couple have been evaluated in relation to marital and relational satisfaction in couples before fertility treatment.

In a study aimed at identifying changes in emotional, marital, and sexual functioning across three cycles of IVF treatment, and at post-treatment follow-up, Slade and colleagues studied 144 couples with a set of questionnaires including the Dyadic Adjustment Scale (DAS) (Response rate 98%) (Slade, *et al.*, 1997). Baseline measurement was on day 1 of the first cycle of IVF treatment. Women starting IVF reported lower marital adjustment than their partners did.

Another prospective cohort study did not find this gender difference in marital adjustment (DAS) between 116 women and 107 men attending an infertility clinic (Edelmann and Connolly, 2000).

In the cross-sectional validation study of the Fertility Problem Inventory (FPI) conducted by Newton and colleagues, 3 months before their first IVF marital adjustment (DAS) was assessed in 1153 women and 1149 men (Newton, *et al.*, 1999). Men and women who described higher global stress also reported lower levels of marital adjustment. For both men and women, relationship and sexual concerns were better predictors of poorer adjustment than all other scales.

Peterson and colleagues found that men and women in couples who perceived equal levels of social infertility stress (measured with the Fertility Problem Inventory) reported higher levels of marital adjustment (measured with the DAS) than men and women in couples who perceived the stress differently (Peterson, *et al.*, 2003). Women in couples who felt a similar need for parenthood reported significantly higher levels of marital satisfaction than women in couples where men showed a greater need for parenthood.

In a prospective study, Shindel and colleagues investigated the male partner's relationship quality in 121 couples presenting for infertility treatment (Shindel, *et al.*, 2008). The Self-Esteem and Relationship Quality Scale (SEAR) survey, a 14-item validated instrument, was used for the assessment of relationship quality and sexual confidence in men. Relationship duration and women's assessment

of relationship quality were predictive of men's assessment of their relationship quality, but men's depression scores and their erectile functioning were not.

In a prospective three-wave study implemented by Lowyck and colleagues following 70 couples starting IVF treatment, it was shown that the following psychosocial factors were positively associated with relationship satisfaction: lower number of previous treatments, lower self-criticism, and higher attachment security (perceiving one's partner as being emotionally available and responsive). Preoccupied (being overly preoccupied with the availability of one's partner) or dismissive (dismissing the need for his/her presence) romantic attachments may negatively affect relationship satisfaction. Gender and duration of fertility problems were not significantly associated with relationship satisfaction (Lowyck, *et al.*, 2009a). The same group found in the same patients that relationship satisfaction was also associated with well-being and sexual concerns (Lowyck, *et al.*, 2009b).

Relational stress and concerns

Several characteristics of the couple have been evaluated in relation to marital and relational stress and concerns before fertility treatment.

In the cross-sectional validation study of the Fertility Problem Inventory (FPI) conducted by Newton and colleagues 3 months before their first IVF, relationship concerns were assessed in 1153 women and 1149 men (Newton, *et al.*, 1999). Gender and fertility history (i.e., children from present or past relationships versus no children) were not associated with relationship concerns (FPI). The infertility diagnosis had an effect on relationship concerns, with higher concerns in male infertility, but the effect was not significant in post hoc analysis.

In the Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme (prospective cohort study) with 1169 women and 1081 men starting ART, marital distress was measured with the marital subscale of the COMPI fertility problem stress scales (Peterson, *et al.*, 2008). Women reported more fertility-related marital distress than men before the start of treatment. It was also found that a woman's use of active-confronting coping was related to higher male marital distress. A partner's use of active-avoidance coping was related to higher marital distress for men and women, and a partner's use of meaning-based coping was associated with lower marital distress in men.

In the cross-sectional study conducted by Lowyck and colleagues with 68 women about to start IVF treatment, self-criticism was positively associated and relationship satisfaction and well-being were negatively associated with relationship concerns (Lowyck, *et al.*, 2009b). No significant associations were found for dependency and negative life events in the past 6 months.

A cross-sectional study addressed the potential association of occupational class and coping strategies with marital and relationship stress in 404 women starting fertility treatment (Lykeridou, *et al.*, 2011). The Copenhagen Multi-centre Psychosocial Infertility (COMPI) questionnaire was used to assess the participants' infertility-related stress as well as their coping strategies and social class. Marital stress did not seem to be associated with the occupational class of patients (high, medium, low, and very low). Active-avoidance and passive-avoidance coping strategies were positively associated with marital stress. Active-confronting coping was also positively correlated, whereas meaning-based coping was the only coping strategy negatively correlated with marital stress.

The same group found in the same patients that women with unexplained infertility reported higher marital stress than those with female, male, or mixed infertility, but the difference was not statistically significant ([Lykeridou, et al., 2009](#)).

In a cross-sectional study of 316 couples before starting their first IVF/ICSI treatment, Donarelli and colleagues found no gender difference in relationship concerns (measured with FPI) ([Donarelli, et al., 2012](#)). They also assessed relationship attachment dimensions, attachment anxiety (i.e., the extent to which people are insecure versus secure about their partner's availability and responsiveness), and attachment avoidance (i.e., the extent to which people are uncomfortable being close to others versus secure depending on others) with the Experiences in Close Relationships (ECR) scale. The authors reported an association of attachment anxiety, attachment avoidance, and anxiety levels (STAI) with relationship concerns in both women and men. Furthermore, attachment avoidance in women was positively associated with men's overall infertility stress and relationship concerns.

A recent cross-sectional study investigated the association between severe depressive symptoms in 1131 women and 1049 men with individual and dyadic infertility-related marital distress ([Peterson, et al., 2014](#)). Severe depressive symptoms were measured with the Mental Health Inventory 5. Infertility distress was measured with the COMPI Fertility Problem Stress Scales. Women and men with severe depressive symptoms had significantly higher levels of marital distress. Furthermore, an individual's severe depressive symptoms were associated with higher levels of marital distress in their partner. These associations between severe depressive symptoms and effects on the partner's distress did not differ for men and women.

Sexual relationship

Several characteristics of the couple have been evaluated in relation to sexual relationship and sexual stress and concerns before fertility treatment. Sexual concerns are diminished sexual enjoyment or sexual self-esteem, scheduled sexual relations difficult (definition FPI).

In the study of Slade and colleagues assessing emotions and relationships of 144 couples before and during treatment, sexual satisfaction was assessed with the Golombok–Rust Inventory of Sexual Satisfaction (GRISS) ([Slade, et al., 1997](#)). Where GRISS scores could be compared for men and women, namely for infrequency, non-communication, dissatisfaction, avoidance, and non-sensuality, all scores were significantly different. The levels were all significantly higher for women, suggesting greater difficulties, but the scores did not appear to be indicative of psychosexual problems.

In the cross-sectional validation study of the Fertility Problem Inventory (FPI) conducted by Newton and colleagues 3 months before their first IVF, women described significantly higher stress in terms of sexual concerns than men ([Newton, et al., 1999](#)). Both men and women facing male infertility reported more sexual concerns than men and women experiencing female or idiopathic infertility ($p < 0.05$). Furthermore, individuals without a biological child from present or past relationships reported significantly greater sexual concern as compared with individuals with at least one child.

In the cross-sectional study conducted by Lowyck and colleagues with 68 women about to start IVF treatment, it was shown that well-being and relationship satisfaction were negatively associated with sexual concerns ([Lowyck, et al., 2009b](#)). Self-criticism and dependency were positively associated with sexual concerns in a hierarchical multivariate regression analysis.

In a cohort study, Peterson and colleagues evaluated the relationship between anxiety and sexual infertility-related stress in 295 men and 306 women referred for IVF and IUI (Peterson, *et al.*, 2007). Anxiety was assessed with the Beck Anxiety Inventory (BAI) and sexual infertility-related stress with the Fertility Problem Inventory (FPI). Women reported greater sexual stress than did men 2 months before the start of the cycle. For both men and women, anxiety symptoms were positively associated with sexual infertility stress. Anxiety symptoms explained 21% of the variance in sexual infertility stress scores for men and 14% for women.

In the study of Donarelli and colleagues, significantly higher levels of sexual concerns were described in women as compared with men (measured with FPI) (Donarelli, *et al.*, 2012). The authors also reported an association between relationship attachment dimensions (attachment anxiety and attachment avoidance (Experiences in Close Relationships (ECR) scale)) and sexual concerns in women and men. In men, sexual concerns were also associated with anxiety and negatively associated with a diagnosis of female-factor infertility.

In a prospective study evaluating sexual function and quality of life factors in male partners of infertile couples presenting for the treatment of infertility, Shindel and colleagues investigated the male partner's relationship quality in 121 couples presenting for infertility treatment (Shindel, *et al.*, 2008). Sexual dysfunction in the female partner was positively associated with erectile dysfunction in the male partner ($p < 0.01$).

Social stress

Several characteristics of the couple have been evaluated in relation to social stress and concerns before fertility treatment. Social concerns are defined as sensitivity to comments, reminders of infertility, feelings of social isolation, and alienation from family or peers (definition FPI).

In the FPI validation study of Newton and colleagues, women described significantly higher specific stress in terms of social concerns than did men (Newton, *et al.*, 1999). Both men and women facing male or idiopathic infertility reported more social concerns than men and women experiencing only female infertility. Furthermore, individuals without a biological child from present or past relationships reported significantly greater sexual concern than individuals with at least one child.

In the cross-sectional study implemented by Peterson and colleagues, women reported more fertility-related social distress than men did (Peterson, *et al.*, 2008). It was also shown that a partner's use of active-avoidance coping was related to higher social distress for men and women. In addition, for women, their partner's use of meaning-based coping was associated with higher social distress.

In another cross-sectional study implemented by the same group, women and men with severe depressive symptoms had significantly higher levels of social distress compared with women and men without severe depressive symptoms (Peterson, *et al.*, 2014). Furthermore, it was also observed that individual's severe depressive symptoms were associated with higher levels of social distress for their partner. These associations between severe depressive symptoms and effects on the partner's distress did not differ for men and women.

In a study questioning 404 Greek women before undergoing their first treatment attempt in that clinic, women with low educational level (i.e., primary education) had higher social stress (measured with COMPI) than women with medium or high educational level (Lykeridou, *et al.*, 2009). Furthermore, female partners of couples diagnosed with male fertility reported higher levels of social stress than

those with female, mixed, or idiopathic infertility. In a study assessing coping styles in the same study cohort, social stress was positively correlated both with active-avoidance and active-confronting coping (Lykeridou, *et al.*, 2011).

In a cross-sectional study of 316 couples before starting their first IVF/ICSI treatment, Donarelli and colleagues found significantly higher levels of social concerns in women as compared with men (measured with FPI) (Donarelli, *et al.*, 2012). The authors also reported a correlation between anxiety levels (STAI) and social concerns in both women and men. Furthermore, they reported an association between attachment anxiety (Experiences in Close Relationships (ECR) scale) and social concerns. Social concerns in men were also affected by attachment avoidance.

Conclusion and considerations

The evidence reviewed suggests that women report higher social and sexual stress and/or concerns than men. Women also reported worse marital adjustment and higher relational stress in the studies of Slade and of Peterson, respectively, but in other studies no gender difference was found for marital adjustment and relational stress. The data also suggest that the way partners react to the infertility problem and their coping strategies (e.g., the way in which a partner deals with a specific stressor) affect the other partner’s relational and social needs. Couples without an ART treatment history and where members have a similar need for parenthood seem to present better relational adjustment. Finally, the cause of infertility also seems to be associated with the levels of relational, social, and sexual stress that patients experience.

Recommendations

<p>Fertility staff should be aware that women experience higher social and sexual infertility-specific stress than men (Slade, <i>et al.</i>, 1997; Newton, <i>et al.</i>, 1999; Peterson, <i>et al.</i>, 2007; Peterson, <i>et al.</i>, 2008; Donarelli, <i>et al.</i>, 2012; Peterson, <i>et al.</i>, 2014).</p>	<p>C</p>
<p>Fertility staff should be aware that the ways patients deal with their fertility problems are associated with infertility-specific relational and social distress.</p> <ul style="list-style-type: none"> • The use of meaning-based coping (e.g., thinking about the fertility problem in a positive light, finding other goals in life) seems to be associated with lower fertility-specific marital and social distress. • The use of avoidance coping strategies (e.g., avoiding being among pregnant women) seems to be associated with higher fertility-specific marital and social distress (Peterson, <i>et al.</i>, 2008). 	<p>C</p>
<p>Fertility staff should be aware that, in couples, the way one partner reacts to the infertility condition/diagnosis is associated with how the other partner reacts (Peterson, <i>et al.</i>, 2008; Peterson, <i>et al.</i>, 2014).</p>	<p>C</p>

Fertility staff should be aware that couples who have different views on the importance of parenthood and social concerns may show lower relationship satisfaction than those who have similar views (Peterson, et al., 2003).

C

2.2.c Emotional needs

The available evidence about patients' emotional needs refers to anxiety, depression, stress/distress, infertility-related stress, psychopathology, general well-being, and risk of emotional maladjustment.

Clinical evidence

Anxiety

Several characteristics of the couple have been evaluated in relation to their levels of anxiety before treatment. Questionnaires to assess anxiety in the included studies are the Spielberger State-Trait Anxiety Inventory (STAI) and the Beck Anxiety Inventory (BAI).

In the study of Slade and colleagues assessing emotions and relationships of 144 couples before and during treatment, state and trait anxiety scores, assessed with STAI, showed that women were significantly more anxious than men (Slade, et al., 1997).

In the FPI validation study of Newton and colleagues assessing 1149 men and 1153 women, levels of state anxiety were associated with global stress (total score on FPI) (Newton, et al., 1999). All five subscales of the FPI were equally positively associated with levels of anxiety (assessed with STAI).

In a prospective cohort study assessing gender differences in response to infertility and infertility investigations, Edelman and Connolly found no difference in state and trait anxiety (STAI) between 116 women and 107 men attending an infertility clinic, and 152 couples referred to an IVF clinic (Edelman and Connolly, 2000).

In the prospective study of Peterson assessing anxiety (BAI) and sexual stress in 306 women and 295 men, women reported significantly greater total anxiety symptoms than men (Peterson, et al., 2007).

In a cross-sectional study performed by Lykeridou and colleagues with 404 women before undergoing their first infertility treatment attempt, women of low social class presented higher state and trait anxiety scores (STAI) than women of medium and higher social class (Lykeridou, et al., 2011). Positive correlations were observed between active-avoidance coping and state and trait anxiety. Meaning-based coping was negatively associated with state anxiety. The same authors found for the same group of patients that women in couples with male infertility reported higher levels of state anxiety than those in couples with female, mixed, or idiopathic infertility. Participants with unknown factor infertility reported higher levels of trait anxiety than those with female-, mixed-, or male-factor infertility. Medical factors such as duration of infertility, number of previous therapies, and existence of a child were not statistically significantly associated with patients' anxiety levels (Lykeridou, et al., 2009).

In a cross-sectional study of consecutive couples before starting their first IVF/ICSI treatment, Donarelli and colleagues found no differences in state anxiety between 316 women and 316 men with the state anxiety scale of the STAI (Donarelli, et al., 2012).

In the cross-sectional study by Reis and colleagues, couples undergoing ART treatment for the first time showed greater levels in state anxiety (assessed with STAI-Y) compared with couples undergoing repeated ART (Reis, *et al.*, 2013). The difference in trait anxiety was not statistically significant. In both groups, state anxiety scores were significantly higher for men than for women, with a small effect size for 'first time' couples and a medium effect size for couples undergoing consecutive ART treatments. There was no significant correlation in responses between members of the couples with respect to state-trait anxiety levels.

Turner and colleagues implemented a cross-sectional study with 29 women undergoing an initial IVF cycle and 15 women entering a repeated IVF cycle (Turner, *et al.*, 2013). Baseline measurement before the start of ovarian stimulation showed that the two groups did not differ significantly in state or trait anxiety scores.

Depressive symptoms

Characteristics of the couple have been evaluated in relation to their levels of depression before treatment. The included studies used two different questionnaires to assess depression in their participants: the Beck Depression Inventory (BDI) and the Centre for Epidemiologic Studies – Depression Scale (CES-D).

In the study of Slade mentioned above, depression (BDI) was assessed in 144 couples before treatment (Slade, *et al.*, 1997). Women's levels of depression were significantly higher than those for the men. Other associations or predictors for depression were not evaluated.

In the FPI validation study of Newton and colleagues, both men and women who reported greater global stress (total score on FPI) also reported higher levels of depression (BDI) (Newton, *et al.*, 1999). More in detail, higher social, sexual, and relationship concerns were associated with higher levels of depression. Gender differences in depression were not assessed.

In the prospective cohort study by Edelmann and Connolly, no difference in depression (BDI) were found between 116 women and 107 men attending an infertility clinic (Edelmann and Connolly, 2000).

In a study of Peterson from 2003, assessing 525 couples with primary infertility, women showed significant higher levels of depression than men (BDI score 5.7 ± 5.9 vs 3.4 ± 4.5) (Peterson, *et al.*, 2003). Also, couple incongruity over relational stress and the need for parenthood was associated with higher levels of depression in women, but not in men.

In the cross-sectional study of Lykeridou it was shown that the type of infertility (male, female, mixed, or idiopathic infertility) was not associated with depression (measured with CES-D) in 404 Greek women before treatment (Lykeridou, *et al.*, 2009). Women's educational level was associated with depression; women with low educational level had higher mean scores of depression than women with medium or high educational level. No association was reported between depression levels and any of the other demographic or medical factors explored.

Dhaliwal and colleagues reported that the incidence of depression (measured by the Hamilton Rating Scale for Depression) was low in 120 couples in India (Dhaliwal, *et al.*, 2004). Before starting the investigations for infertility and at four time points during the infertility workup, women reported significantly more depressive symptoms than their male partners did.

In their cross-sectional study, Reis and colleagues compared 43 couples undergoing ART treatment for the first time with 46 couples undergoing consecutive ART treatments, with the BDI-II (Reis, *et al.*, 2013). Couples from the latter group showed greater depression levels in cognitive and affective factors than couples undergoing ART treatment for the first time. In both groups, in the comparison of women and men within each couple, women had significant higher scores on the total BDI-II scales than the men, with a small effect size for both groups ($d = 0.37$ for 'first time' couples and $d = 0.46$ for couples undergoing consecutive ART treatments). There was no significant correlation in responses between members of the couples with respect to depression levels.

Stress/distress

Characteristics of the couple have been evaluated in relation to their levels of stress or distress before treatment. The included studies used different questionnaires to assess stress: infertility-specific stress was assessed with the Fertility Problem Inventory (FPI) (scale of global stress) or the COMPI fertility problem stress scales (personal stress subscale); general psychological distress was assessed with the Brief Symptom Inventory (BSI) or the Perceived Stress Scale (PSS).

In the Fertility Problem Inventory (FPI) validation study of Newton and colleagues with a sample of consecutively referred patients (1153 women and 1149 men) seen for infertility treatment, women scored significantly higher than men on scales of global stress (Newton, *et al.*, 1999). Furthermore, a significant multivariate main effect indicated that the combined scales of stress were significantly affected by fertility history (i.e., higher stress in individuals without a biological child from present or past relationships), and fertility diagnosis (i.e., higher global stress in individuals with male infertility, versus idiopathic and female infertility).

In the study implemented by Peterson and colleagues examining stress, depression, and adjustment in infertile couples, women reported significantly higher levels of infertility-related stress than men (global stress FPI, and all five subscales) (Peterson, *et al.*, 2003).

A cross-sectional study by Peterson and colleagues examined the impact of partner coping on infertility-specific personal stress in 1169 women and 1081 Danish men prior to beginning assisted reproduction treatment (Peterson, *et al.*, 2008). Women demonstrated both higher levels of usage of all coping mechanisms and higher amounts of personal stress when compared with men. In women, active-avoidance, active-confronting, and passive-avoidance were positively associated with personal stress, and meaning-based coping was negatively associated. In men, active-avoidance and passive-avoidance coping were positively associated with personal stress. In addition, one partner's use of active-avoidance coping was positively associated with his or her partner's distress.

In a cross-sectional study, the predictive value of a theoretical framework (including personality characteristics, partner attachment, coping, intrusiveness, and infertility-related stress) for psychological distress (BSI) was investigated in 106 women and 102 men (Van den Broeck, *et al.*, 2010). A positive relation with psychological distress was found for dependency, self-criticism, passive coping, and intrusiveness (Impact of Event Scale). Active coping was negatively associated with psychological distress.

In a study questioning 404 women undergoing infertility treatment, women of low/very low social class reported higher levels of personal stress than those of medium or high social class (Lykeridou, *et al.*, 2011). Personal stress (measured with the COMPI questionnaires) was positively correlated with active-avoidance, active-confronting, and passive-avoidance coping.

In a cross-sectional study, Donarelli and colleagues investigated whether attachment anxiety and avoidance dimensions in female and male partners in couples seeking fertility treatment were associated with her and his infertility stress (global stress FPI) (Donarelli, *et al.*, 2012). Attachment anxiety and avoidance were positively associated with infertility stress in both women and men. In addition, women's attachment avoidance was positively associated with their partner's infertility stress. Men's attachment anxiety was also associated with their partner's infertility stress. Finally, diagnosis of female-factor infertility was negatively associated with overall infertility stress in men.

Turner and colleagues also evaluated stress with the Perceived Stress Scale (PSS) in their cross-sectional study with 29 women undergoing an initial IVF cycle and 15 women entering a repeated IVF cycle (Turner, *et al.*, 2013). Baseline measurement before the start of ovarian stimulation showed that the two groups did not differ significantly in perceived stress before treatment.

Another cross-sectional study, implemented by Peterson, reported significantly higher levels of stress in women compared with men. Women and men with severe depressive symptoms had significantly higher levels of personal distress compared with women and men without severe depressive symptoms (Peterson, *et al.*, 2014). Furthermore, it was observed that an individual's severe depressive symptoms were associated with higher levels of personal distress for their partner. These associations between severe depressive symptoms and effects on the partner's distress did not differ for men and women.

Psychopathology

Edelmann and Connolly investigated in their prospective cohort study two samples of infertile couples: 116 women and 107 men attending an infertility clinic and 152 couples who were consecutive referrals to an IVF clinic (Edelmann and Connolly, 2000). They assessed general psychopathology with the General Health Questionnaire. In both samples, women reported significantly higher psychopathology than men did.

General well-being

One study was found evaluating well-being (with the Amsterdam scale of well-being) in patients before fertility treatment. In their cross-sectional study, Lowyck and colleagues showed that in 68 women about to start IVF treatment, well-being was negatively associated with self-criticism, dependency, sexual concerns, and relationship concerns, and positively associated with relationship satisfaction (Lowyck, *et al.*, 2009b). No association was found between psychological well-being and negative life events in the past 6 months other than fertility problems, age, level of education, length of the relationship, duration of fertility problems, or number of prior treatments. In a second study of the same group assessing also the male partners of the couples, no association was found between gender and well-being.

Risk for emotional maladjustment

SCREENIVF is a validated short questionnaire consisting of 34 items, aimed at identifying women at risk of emotional maladjustment before the start of their IVF/ICSI treatment (Verhaak, *et al.*, 2010). In a prospective cohort study, the authors investigated to what extent SCREENIVF, administered before the start of the first treatment cycle, showed a predictive value for the emotional adjustment of women after this cycle, in a large sample recruited from different fertility centres. SCREENIVF successfully identified 75% of the patients as at risk or not at risk. The negative predictive value was high (89%) whereas the positive predictive value for emotional adjustment after the treatment cycle was low (48%)

in the total sample and 56% after unsuccessful treatment). This indicates that SCREENIVF performed better in identifying women without clinical problems, than in identifying women with clinical problems.

The implementation of the SCREENIVF instrument was evaluated by Van Dongen and colleagues in a prospective cohort study (Van Dongen, *et al.*, 2012). The uptake rate of SCREENIVF was 78% to 80%. One-third of the responders were found to be at risk of emotional maladjustment, which was comparable to previous studies using SCREENIVF. The response rate to the process evaluation was 43% ($n = 91$). Of these, 90% found the screening was useful, and almost all patients were positive about the SCREENIVF questionnaire. Furthermore, 93% recognized themselves in the risk profile based on SCREENIVF. Of the patients at risk, 21% reported planning to seek professional help, but 46% of the at-risk patients experienced travelling distance as an obstacle to seeking psychological help. Of 27 non-responders to SCREENIVF, 41% explained non-response by 'no actual need for psychological help' and 19% forgot to complete the screening.

Conclusion and considerations

Women seem to be more prone to emotional maladjustment when compared with men (higher depression and infertility stress).

The way couples cope with their infertility condition/diagnosis seems to be related to their emotional adjustment (anxiety and infertility stress). Some coping styles may be protective (e.g., active coping) whereas others seem to be associated with worse adjustment (e.g., avoidant, passive coping). However, the way coping strategies are measured differs between studies, making it difficult to interpret results. The emotional reactions to infertility of the two members of the couple and their attachment styles seem to influence both their own and their partner's emotional adjustment. Individual personality characteristics are, as expected, also related to adjustment.

Lower social class was associated with higher anxiety and infertility stress. In addition, infertility cause was not associated with depression but it was associated with anxiety, with women in couples with male infertility being more anxious.

One infertility-specific screening tool is available to identify women at risk of emotional maladjustment before they start treatment. The SCREENIVF proved to be feasible and sound for the purpose, and almost all patients were positive about it.

Recommendations

Fertility staff should be aware that women have higher levels of depression and infertility stress than men (Slade, *et al.*, 1997; Newton, *et al.*, 1999; Edelmann and Connolly, 2000; Peterson, *et al.*, 2003; Reis, *et al.*, 2013; Peterson, *et al.*, 2014).

C

<p>Fertility staff should be aware that patients with a lower occupational status experience higher infertility stress and anxiety than patients with a medium or high occupational status (Lykeridou, et al., 2009; Lykeridou, et al., 2011).</p>	<p>C</p>
<p>Fertility staff should be aware that women whose partner has male-factor infertility experience higher anxiety than women with female factor, mixed or unexplained infertility, whereas type of infertility diagnosis is not related to depression (Lykeridou, et al., 2009).</p>	<p>C</p>
<p>Fertility staff should be aware that the way patients deal with their fertility problems is associated with their infertility distress.</p> <ul style="list-style-type: none"> • The use of passive coping (e.g., rumination, withdrawal) seems to be associated with higher levels of infertility distress. • The use of active coping (e.g., goal-oriented problem-solving, thinking rationally about the problem) seems to be associated with lower infertility distress (Van den Broeck, et al., 2010). 	<p>C</p>
<p>Fertility staff should be aware that individuals who perceive their partner to be available and responsive experience lower infertility stress than individuals who perceive their partner to be avoidant and non-responsive (Van den Broeck, et al., 2010; Donarelli, et al., 2012).</p>	<p>C</p>
<p>Fertility staff should be aware that, in couples, each partner's depressive symptoms are associated with their own and their partner's infertility-specific distress (Peterson, et al., 2014).</p>	<p>C</p>
<p>Fertility staff should be aware that the SCREENIVF is an infertility-specific validated tool designed to be used before the start of treatment, to assess risk factors for emotional problems after a treatment cycle (Verhaak, et al., 2010; Van Dongen, et al., 2012).</p>	<p>B</p>
<p>The guideline development group recommends that fertility staff use the SCREENIVF before the start of each treatment cycle to assess patients' risk factors for emotional problems after the cycle.</p>	<p>GPP</p>

2.2.d Cognitive needs

The available evidence about patients' cognitive needs refers to knowledge about IVF treatment.

Clinical evidence

Knowledge

Slade and colleagues questioned 144 couples embarking on their first cycle of IVF treatment, on their knowledge of pregnancy rates for one cycle of IVF (Slade, *et al.*, 1997). Men estimated the probability of giving birth to a baby following one IVF treatment cycle to be 36.0% (± 13.83), which was significantly higher compared with women (31.4% ± 13.06).

Conclusion and considerations

There is a lack of information about factors associated with the cognitive needs of patients before treatment.

Recommendations

None.

Research recommendations

The included studies are either cross-sectional or prospective cohort studies of varying quality. Overall, the relevant data appear heterogeneous in the pre-treatment period because of the many dimensions of emotional (mal)adjustment. It is difficult to compare the studies, because of the varying outcomes (i.e., stress, distress, depression, anxiety...) and different (validated) instruments that are being used to measure the same concepts. For most of the outcomes, there is no replication of the studies (e.g., the finding concerning personality characteristics and partner attachment).

Despite extensive research there is still little information and few available tools to identify those patients that may need additional psychosocial support before they actually start treatment. Most studies focused solely on women, so this is particularly true for men. In addition, many studies do not take into consideration the fact that the needs of one member of the couple may affect the needs of the other member of the couple. In particular, there is little information about factors associated with increased cognitive needs.

Future research needs to go beyond the present descriptive stage about factors associated or predictive of the psychosocial needs of patients before the start of treatment, to consider how this information can be used to develop and validate infertility-specific tools that may aid fertility staff to identify patients with specific needs and to profile these needs.

2.3 Addressing needs before treatment

Key question

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS BEFORE TREATMENT?

This section provides a comprehensive description of the effects of psychosocial interventions that can be delivered by all fertility staff, on the patients' behavioural, relational and social, emotional, and cognitive needs before treatment.

The goal is for staff to integrate those interventions that have positive effects on the patients' needs during the pre-treatment period, into the daily routine care they provide at clinics.

General recommendation

The guideline development groups recommends that fertility staff refer patients at risk of experiencing clinically significant psychosocial problems to specialized psychosocial care (infertility counselling or psychotherapy).

GPP

2.3.a Behavioural needs

Behavioural needs include compliance with treatment and lifestyle behaviour. The effects of four interventions identified to address patients' behavioural needs before the start of treatment are summarized in Table 2.1.

Clinical evidence

Compliance with treatment

Pook and Krause implemented an RCT to assess an intervention based on an information leaflet for infertile males starting infertility diagnosis (Pook and Krause, 2005). The leaflet was sent by post to all men that made an appointment for a fertility evaluation. The leaflet explained what would happen during the appointment and included: information about the contents and sequence of the different components of the fertility workup; questions that would be asked by the physician; detailed description of the medical examinations; reassurance that no test more invasive than a blood sample would be performed during the consultation; information on sensory aspects; and a description of the room for sperm sample preparation (separate, no time pressure, clean, fears of not being able to produce addressed). The control group did not receive the leaflet. Men who received the leaflet showed higher attendance rates than the control group of men that did not receive the preparatory information sheet.

Hope and colleagues conducted an RCT to assess whether the provision of an educational DVD (12-min duration) was more effective than an educational brochure in increasing knowledge about elective single embryo transfer (eSET) in IVF, as well as its uptake (as opposed to elective double embryo transfer (eDET)) (Hope and Rombauts, 2010). The DVD and brochure provided identical factual information on outcomes and risks of twin pregnancies. The DVD also included two short interviews with mothers of twins. After the interventions, both groups showed an increase in compliance with

eSET (versus undecided or eDET), but this was higher for the DVD group. For those individuals that were initially undecided, the DVD was more likely than the brochure to increase compliance with eSET.

Table 2.1. The effect of interventions administered by fertility staff, on patients' behavioural needs before treatment

Intervention	Behavioural needs					
	Lifestyle behaviour					Compliance
	Waist circumference	Weight	BMI	Ovulation	Pregnancy	
Information leaflet (Pook and Krause, 2005) <i>RCT</i>						+
Educational brochure and DVD (Hope and Rombauts, 2010) <i>RCT</i>						+
Weight-loss programme based on diet and exercise (Moran, et al., 2011) <i>RCT</i>	+	+	+		ns	
Weight-loss programme based on diet and exercise (Clark, et al., 1998) <i>Prospective study</i>		+		+	+ ^a	

+: positive effect of the intervention on patient need.

ns: no significant effect of the intervention on patient need.

Blank cells indicate that an association was not studied.

^aStatistical significance could not be calculated due to control group having zero pregnancies.

Lifestyle behaviour

Moran and colleagues implemented an RCT to assess the effect of a high-protein weight-loss programme with exercise for overweight and obese women (Moran, et al., 2011). The programme was delivered before start of IVF, ending at embryo transfer, and the outcomes assessed were waist circumference, weight, body mass index (BMI), and pregnancy. The programme consisted of a nutritionally adequate reduced energy diet and an exercise component, which consisted of a home-based physical conditioning and walking programme. A qualified dietician provided dietary and exercise advice. Women received one face-to-face education session and one face-to-face and another phone follow-up session. The control condition consisted of standard treatment, i.e. standard advice on appropriate diet and lifestyle factors influencing fertility provided face-to-face at one session with no active follow-up. Both women who received the intervention and the control group showed reductions in waist circumference. Only women who received the intervention showed reductions in weight and BMI. In the intervention group, 12 out of 20 women achieved pregnancy, whereas in the control group 8 out of 20 women achieved pregnancy. These differences were not statistically significant, but power was limited for this analysis.

Clark and colleagues conducted a prospective study to assess a 6-month weight-loss programme for obese infertile women (irrespective of their infertility diagnosis) (Clark, *et al.*, 1998). The outcomes assessed were weight, ovulation, and pregnancy. The intervention consisted of a weekly programme aimed at lifestyle changes in relation to exercise and diet. More specifically, 87 women attended 2-h weekly sessions; the first hour consisted of exercise and the second hour of seminars covering a wide range of weight-related topics, including diet and nutrition. The dietary sessions concentrated on healthy eating choices and cooking methods rather than calorie counting. The control group included those women that did not complete the 6-month programme (23% of initial sample). Women in the intervention group showed a significant weight loss not observed in the control group; 90% of previously anovulatory women who did the intervention recovered ovulation and 78% achieved pregnancy, compared with none of the women in the control group (for both ovulation and pregnancy).

Conclusion and considerations

Weight-loss programmes based on diet and exercise seem to be effective in helping overweight and obese women to lose weight in order to undergo fertility treatment. One of these interventions also showed to have a positive effect on pregnancy rates; however, this study used as controls the group of women who dropped out of the intervention, instead of using a typical control group composed of women receiving standard care. It may be that those women were in general less motivated to fully comply with all the necessary treatment procedures, which could explain the lower pregnancy rates obtained. Therefore, at the moment no definitive conclusions can be made about the impact of weight-loss programmes on treatment success rates. In the face of the lack of efficient interventions, the minimum care standards would suggest that at least patients should be informed about lifestyle factors that may affect their fertility and be offered the support to address these, if needed.

One study also showed that a one-page information leaflet resulted in higher attendance at fertility assessment in men, and suggests that providing information in advance about physically and emotionally demanding medical procedures may promote compliance with treatment.

Recommendations

<p>Fertility staff should provide preparatory information about medical procedures because it promotes compliance (Pook and Krause, 2005; Lykeridou, <i>et al.</i>, 2009; Lykeridou, <i>et al.</i>, 2011).</p>	<p>B</p>
<p>Fertility staff should be aware that weight-loss programmes based on diet and exercise offered pre-ART treatment may be effective in reducing weight and body mass index (BMI) (Clark, <i>et al.</i>, 1998; Moran, <i>et al.</i>, 2011).</p>	<p>B</p>
<p>The guideline development group recommends that fertility staff consider providing patients with information about lifestyle behaviours that may negatively affect their general and reproductive health.</p>	<p>GPP</p>

The guideline development group recommends that fertility staff support patients in changing lifestyle behaviours that negatively affect their general and reproductive health, as well as their chances of treatment success.

GPP

2.3.b Relational and social needs

Relational and social needs include marital adjustment and sexual functioning.

Clinical evidence

Takefman implemented an RCT to test an information intervention for couples starting the infertility diagnostic phase (Takefman, *et al.*, 1990). Three intervention conditions were compared, based on the type of information delivered. The first intervention provided emotional and sexual information and included: a specification of the rationale for providing information (i.e., might prepare patients to cope better); a 15-min video about the medical procedures and emotional aspects of fertility treatment; and a 15-page booklet with sexual information (information about the sexual impact of treatment and tips in case of developing difficulties). The second intervention provided emotional information and included: a specification of the rationale for providing information (i.e., might prepare patients to cope better); and a 15-min video about the medical procedures and emotional aspects of fertility treatment. The booklet containing sexual information was not included. Finally, the third intervention provided procedural information and included: a specification of the rationale for providing information (i.e., might prepare patients to cope better); and a 12-min video focusing only on the medical procedures. No differences were found for marital adjustment and sexual functioning across the groups receiving these three different interventions (Table 2.2).

Table 2.2. The effect of interventions administered by fertility staff on patients' relational and social needs before treatment.

Intervention/ study	Relational and social needs	
	Marital adjustment	Sexual functioning
Information focusing on 1) emotion and sex, 2) emotion, 3) procedure (Takefman, <i>et al.</i> , 1990) RCT	ns	ns

ns: no significant effect of the intervention on patient need.

Conclusion and considerations

One study suggests that interventions based on information provision do not seem to have a positive effect on the relational needs of patients. Overall, there is a lack of interventions that can be delivered by fertility staff to address the relational and social needs of couples before the start of treatment. However, the evidence from the previous questions (2.a and 2.b) shows patients may experience specific needs and therefore these should be addressed. In addition, the evidence shows that the needs of both members of couples starting treatment are associated; therefore, this also needs to be taken into consideration.

Recommendations

The guideline development group recommends that fertility staff offer additional psychosocial care to patients at risk of experiencing increased infertility-specific relational and social distress.	GPP
The guideline development group recommends that fertility staff actively involve both partners of the couple in the diagnosis and treatment process.	GPP

2.3.c Emotional needs

Emotional needs include depression, anxiety, infertility stress, feelings about infertility, and emotional reactions to hysterosalpingogram and semen analysis. Two interventions addressing patients’ emotional needs before treatment were identified (Table 2.3).

Clinical evidence

In the RCT implemented by Pook and Krause that was described above, men who made an appointment for a fertility evaluation and received the information leaflet by post reported lower infertility-related stress during the evaluation than men who did not receive the leaflet (Pook and Krause, 2005).

In the RCT implemented by Takefman, the procedural information intervention resulted in a decrease of patients’ negative feelings about infertility, whereas it remained stable for the other two interventions (Takefman, et al., 1990). In addition, it was observed that women who received the emotional and sexual information intervention indicated worse emotional reactions to undergoing the hysterosalpingogram and semen analysis than women who received the other two interventions.

Conclusion and considerations

Interventions based on information provision may be useful to decrease infertility-related stress and feelings before the start of treatment. Patients experience other emotional needs before the start of treatment and these also need to be addressed. In addition, the evidence shows that the emotional needs of both members of couples attending treatment are associated; therefore, this should also be taken into consideration.

Table 2.3. The effect of interventions administered by fertility staff on patients' emotional needs before treatment.

Intervention/ study	Emotional needs			
	Depression	Anxiety	Infertility- specific stress	Other
Information leaflet (Pook and Krause, 2005) <i>RCT</i>			+	
Information focusing on 1) emotion and sex 2) emotion 3) procedure (Takefman, <i>et al.</i> , 1990) <i>RCT</i>	ns	ns		<i>Feelings about infertility</i> + (only 3) <i>Negative emotional reactions</i> <i>to hysterosalpingogram and</i> <i>semen analysis</i> - (only 1)

+: positive effect of the intervention on patient need.
 -: negative effect of the intervention on patient need.
 ns: no significant effect of the intervention on patient need.
 Blank cells indicate that an association was not studied.

Recommendations

Fertility staff should provide preparatory information about medical procedures because it decreases infertility-specific anxiety and stress (Pook and Krause, 2005).	C
The guideline development group recommends that fertility staff refer patients identified by the SCREENIVF as being at risk of emotional problems to specialized psychosocial care (infertility counselling or psychotherapy).	GPP
The guideline development group recommends that fertility staff actively involve both partners of the couple in the diagnosis and treatment process.	GPP

2.3.d Cognitive needs

Cognitive needs include knowledge about elective single embryo transfer.

Clinical evidence

Hope and colleagues conducted an RCT to assess whether the provision of an educational DVD (12-min duration) was more effective than an educational brochure in increasing knowledge about elective single embryo transfer (eSET) in IVF, as well as its uptake (as opposed to elective double embryo transfer (eDET)) (Hope and Rombauts, 2010). The DVD and brochure provided identical factual information on outcomes and risks of twin pregnancies. The DVD also included two short interviews with mothers of twins. After the interventions, both groups demonstrated significantly improved knowledge about eSET and eDET pregnancy rates and about the risks and challenges of conceiving twins.

Conclusion and considerations

There is a scarcity of research focusing on addressing the cognitive needs of patients before starting ART.

Recommendation

Fertility staff should provide preparatory information about medical procedures because it increases patient knowledge (Hope and Rombauts, 2010).
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C

Research recommendations

Overall, there is a lack of interventions that can be delivered by fertility staff to address the needs of patients before treatment. This is problematic in light of the evidence highlighting that patients experience different needs during this stage of their treatment pathway. In particular, interventions are needed to promote treatment compliance and other behaviours that optimize chances of treatment success.

Most of the pre-treatment interventions described and evaluated in the literature are based on information provision, and these seem to be effective to address different needs from compliance to knowledge. However, more research is still necessary to identify which types of information are needed and which delivery formats are more efficient for the women and men addressed.

It is crucial that future research directed at validation of psychosocial interventions use randomized controlled trials, because this is the only design that ensures that the differences between intervention and control groups are due to the effect of the interventions. Evaluating procedural issues in the implementation of these interventions is also necessary, so that effectiveness from feasibility and from acceptance can be differentiated. Finally, assessing patient satisfaction and perceived benefits is important but researchers need to be aware that these are not gold standards to use in validation studies, that is, they are not enough to reach conclusions about the efficacy of interventions.

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3. PSYCHOSOCIAL CARE OF PATIENTS DURING TREATMENT

Introduction

The treatment period refers to time that encompasses the treatment cycle, being it either first-line treatment such as ovulation induction (OI) and intrauterine insemination (IUI), or ART cycles (IVF and/or ICSI). One first-line treatment cycle begins at the start of the woman's menstrual cycle. One ART treatment cycle begins at the start of ovulation induction. The treatment cycle can therefore include (according to the treatment performed) ovarian stimulation, oocyte retrieval, embryo transfer, the waiting period until, and the first measurement of treatment outcome (e.g., pregnancy test 15 days after the embryo transfer, first ultrasound scan 6 weeks after the embryo transfer), including reactions to the treatment outcome.

3.1 Needs of patients during treatment

Key question

WHAT ARE THE NEEDS OF PATIENTS DURING TREATMENT?

Rationale for the key question

This question describes the needs that patients experience during fertility treatment and how these needs vary within each treatment cycle. It should be noted that although compliance behaviour occurs in between treatment cycles, before starting or after finishing a cycle, it would still be reported on.

The goal is to increase staff awareness about the needs of patients during treatment.

3.1.a Behavioural needs

The available evidence about patients' behavioural needs refers to compliance with treatment.

Clinical evidence

Compliance with treatment

Compliance refers to the uptake of the ART cycles recommended by the doctor until pregnancy is achieved or until there is a recommendation to end treatment. Non-compliance due to premature discontinuation refers to when patients decide to opt out of (further) treatment despite a favourable prognosis.

A systematic review and meta-analysis investigated compliance rates with ART treatment ([Gameiro, et al., 2013](#)). Patient stated reasons, and predictors of non-compliance with fertility treatment via premature discontinuation were discussed in another systematic review ([Gameiro, et al., 2012](#)). The percentages presented indicate the proportion of times that each reason was selected by patients, whenever they were given the chance to select it.

Compliance with three consecutive ART cycles was 78.2% (95% CI 68.8–85.3%) (Gameiro, *et al.*, 2013). Patients' five most selected reasons for discontinuation across three consecutive cycles of ART were: postponement of treatment or unknown (not differentiated in primary research, 22%); the psychological burden of treatment (20%); the physical and psychological burden of treatment (19%); postponement of treatment (17%); and marital and personal problems (17%) (Gameiro, *et al.*, 2012).

Compliance with first-line treatment was not assessed in the review (Gameiro, *et al.*, 2013). The non-compliance rate with first-line treatment was 7.8% (69/885) in the only longitudinal cohort study assessing non-compliance due to premature discontinuation across all treatment stages. Of all 319 couples that dropped out of treatment, 21.6% (69/319) did so during or after first-line treatment (Brandes, *et al.*, 2009). Patients' five most selected reasons for discontinuation during first-line treatments (i.e., OI, AI, IUI) were: postponement of treatment (i.e., stopping treatment for at least 1 year, 55.36%); logistics and practical reasons (33%); rejection of treatment (9%); perception of poor prognosis (8%); and the psychological burden of treatment (8%) (Gameiro, *et al.*, 2012).

Custers and colleagues did a retrospective observational cohort study to evaluate whether baseline characteristics and prognostic profiles differed between 221 (28%) couples who discontinued from intrauterine insemination (IUI) and 582 (72%) couples who continued IUI, and the reasons for couples discontinuing (Custers, *et al.*, 2013). Discontinuation was defined as not utilizing six completed cycles if not pregnant. Of the 221 couples that dropped out, 100 (45%, 13% of all couples) were advised to stop treatment. From the remaining 121 (55%, 15% of all couples) who decided to discontinue, 62 (28%) dropped out because of: personal reasons (no confidence in treatment (10%); burden of treatment (6.3%); health problems not IUI-related (6.3%); moving house (3.6%); and relational problems (0.9%)) and 59 (27%) were lost to follow-up. It is unclear whether discontinuation from IUI was because other treatments (e.g., IVF) were pursued.

Compliance after a first failed ART cycle was 81.8% (95% CI 73.3–88.1%) and after a second failed cycle was 75.3% (95% CI 68.2–81.2%) (Gameiro, *et al.*, 2013). Patients' five most selected reasons for discontinuation after a first failed ART cycle were: financial issues (50%); the psychological (22%) and physical (17%) burden of treatment; clinic-related reasons (17%) and organizational problems (14%); postponement of treatment (or unknown) (14%); and relational problems (11%) (Gameiro, *et al.*, 2012).

Another recent retrospective observational cohort investigated the medical factors associated with discontinuation from IVF after one first failed cycle (Troude, *et al.*, 2014). From 5135 patients who did a failed IVF cycle, 1337 (26%) did not do more cycles in a 5-year follow-up period; 3798 (74%) couples continued treatment. The five main reasons cited for discontinuation were: perception of poor prognosis (13%); psychological burden of treatment (10.7%); clinic-related issues (9.7%); adoption (7.4%); and other parenting options (5.4%).

Conclusion and considerations

The empirical evidence suggested that around 7.8% and 21.8% of patients, respectively, choose to discontinue first-line and ART treatment due to different reasons. The discontinuation rate from IUI in the Custers study (2013) was higher than 7.8% but the authors did not monitor if couples pursued other types of treatment. Reasons for discontinuation vary according to the types and stage of treatment. The reasons postponement of treatment and psychological burden are common across all types and stages of treatment. Overall, the most cited reasons for non-compliance are: postponement

of treatment; physical and psychological burden; relational and personal problems; clinic/organizational problems; rejection of treatment; and logistical and practical reasons.

There is a lack of knowledge about patients’ lifestyle behaviour during fertility treatment.

Recommendations

<p>Fertility staff should be aware that around 1 in 12 patients and 1 in 5 patients do not comply with first-line and ART treatment, respectively (Brandes, <i>et al.</i>, 2009; Gameiro, <i>et al.</i>, 2013).</p>	<p>A</p>
<p>Fertility staff should be aware that the reasons patients state for discontinuing recommended first-line treatment are:</p> <ul style="list-style-type: none"> • postponement of treatment (i.e., stopping treatment for at least 1 year) • logistics and practical reasons • rejection of treatment • perception of poor prognosis • psychological burden of treatment (Gameiro, <i>et al.</i>, 2012). 	<p>A</p>
<p>Fertility staff should be aware that the reasons patients state for discontinuing recommended treatment after one failed IVF/ICSI cycle are:</p> <ul style="list-style-type: none"> • financial issues • the psychological and physical burdens of treatment • clinic-related reasons and organizational problems • postponement of treatment (or unknown) • relational problems (Gameiro, <i>et al.</i>, 2012). 	<p>A</p>
<p>Fertility staff should be aware that the reasons patients state for discontinuing a recommended standard ART treatment programme of three consecutive cycles are:</p> <ul style="list-style-type: none"> • postponement of treatment • psychological burden of treatment • physical and psychological burdens of treatment • personal problems (Gameiro, <i>et al.</i>, 2012). 	<p>A</p>

3.1.b Relational and social needs

The available evidence about patients' behavioural needs refers to patients' intimacy with partner, marital satisfaction, and sexual satisfaction. Evidence about social needs included social support and social contacts and absence from work.

Clinical evidence

Intimacy with partner

Relational/ social need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Boivin and Takefman, 1996)		✓	✓	✓	✓		
(Boivin, <i>et al.</i> , 1998)		✓	✓	✓	✓	✓	

✓Indicates the time points at which the need was assessed in the studies.

A prospective cohort study compared the daily reactions of 20 women during an IVF cycle (from the first day of ovarian stimulation to the day prior to the pregnancy test) with their reactions during a regular menstrual cycle (Boivin and Takefman, 1996). Overall women reported more intimacy with their partner during all stages of the IVF cycle than during the equivalent stages in the normal menstrual cycle.

Another prospective cohort study assessed the daily emotional reactions of 40 couples undergoing one cycle of IVF/ICSI, from the first day of ovarian stimulation to the day of the pregnancy test (Boivin, *et al.*, 1998). Results showed that intimacy with partner was higher at the retrieval and transfer days than at other days of the IVF cycle.

Marital satisfaction

Relational/ social need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Verhaak, <i>et al.</i> , 2001)	✓					✓	

✓Indicates the time points at which the need was assessed in the study.

A prospective cohort study followed 207 women that started an IVF or ICSI cycle, assessing them 3 to 12 days prior to the start of treatment and 3 weeks after the pregnancy test (Verhaak, *et al.*, 2001). Marital satisfaction scores prior to the start of treatment were not different from those observed in the general population. No differences in marital satisfaction were observed across the two assessment moments.

Sexual satisfaction

Relational/ social need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Verhaak, <i>et al.</i> , 2001)	✓					✓	

✓ indicates the time points at which the need was assessed in the study.

The same study by Verhaak and colleagues assessed sexual satisfaction. Sexual satisfaction scores prior to the start of treatment were not different from those observed in the general population, and decreased from prior to the start of treatment to after the pregnancy test for women with a successful or an unsuccessful treatment (Verhaak, *et al.*, 2001).

Social support

Relational/ social need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Boivin and Takefman, 1996)		✓	✓	✓	✓		

✓ indicates the time points at which the need was assessed in the study

The prospective cohort study investigating the daily reactions of 20 women to an IVF cycle also assessed their perceived social support (Boivin and Takefman, 1996). Women perceived less social support during the retrieval to transfer stage, but more during the waiting period stage of the IVF cycle than during equivalent stages in the normal menstrual cycle.

Absence from work

Relational/ social need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Bouwman, <i>et al.</i> , 2008)		✓	✓	✓	✓	✓	

✓ indicates the time points at which the need was assessed in the study.

A prospective cohort study followed 380 women with a paid job while they underwent a standard IVF cycle, more precisely from the first day of ovarian stimulation until 10 weeks thereafter, which is around 4 weeks after the pregnancy test. Women were asked to fill in the Health and Labour Questionnaire (HLQ) daily, reporting the number of hours they were absent from work. Of all the women with paid work, 62% reported IVF-related absence from work. Overall, IVF-related absence from work averaged 23 h whereas non IVF-related absence averaged 9.5 h. The estimated costs of IVF-related and non IVF-related absence from work were 596 and 250 euros, respectively (Bouwman, *et al.*, 2008).

Conclusion and considerations

Couples undergoing one cycle of IVF treatment experience higher marital intimacy than during a regular menstrual cycle, especially during the oocyte retrieval and embryo transfer. Marital satisfaction remains stable across one cycle of treatment, regardless of its outcome, but sexual satisfaction decreases for all women. Women undergoing IVF experience low social support during the oocyte retrieval and embryo transfer stages. Women are absent from work due to IVF treatment more than twice the number of hours for which they are absent due to any other issue.

No evidence was found about the relational needs of couples undergoing first-line fertility treatment.

Recommendations

Fertility staff should be aware that the relational satisfaction of patients does not change from before they start an IVF/ICSI cycle to after the pregnancy test (Verhaak, <i>et al.</i>, 2001).	B
Fertility staff should be aware that women report more intimacy with their partner during an IVF/ICSI cycle than during a normal menstrual cycle, in particular at the retrieval and transfer days of the cycle (Boivin and Takefman, 1996).	B
Fertility staff should be aware that women experience lower sexual satisfaction after the pregnancy test than before the start of an IVF/ICSI cycle (Verhaak, <i>et al.</i>, 2001).	B
Fertility staff should be aware that women report lower social support from significant others in the period between the oocyte retrieval and the embryo transfer of an IVF/ICSI cycle than during the equivalent period in a normal menstrual cycle (Boivin and Takefman, 1996).	B
Fertility staff should be aware that during an IVF/ICSI cycle, 6 in 10 patients report treatment-related absences from work and, on average, patients miss 23 h of work (Bouwman, <i>et al.</i>, 2008).	C

3.1.c Emotional needs

The available evidence about patients' behavioural needs refers to depression, anxiety, stress/distress, psychiatric disorders and morbidity, positive and negative affect, mood, optimism, grief, and self-esteem.

Clinical evidence

Depressive symptoms

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval/semen collection	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Verhaak, <i>et al.</i> , 2007)	✓		✓			✓	✓
(Boivin and Lancaster, 2010)		✓			✓	✓	
(Chiaffarino, <i>et al.</i> , 2011)	✓					✓	
(Knoll, <i>et al.</i> , 2009)			✓	✓		✓	
(Khademi, <i>et al.</i> , 2005)	✓					✓	
(Karatas, <i>et al.</i> , 2011)	✓			✓		✓	
(Lukse and Vacc, 1999)	✓					✓	
(Berghuis and Stanton, 2002)	✓					✓	
(Li, <i>et al.</i> , 2013)			✓				

✓ indicates the time points at which the need was assessed in the studies.

A systematic review that investigated women's emotional response within one and across consecutive IVF treatment cycles (from before the start of treatment to after the pregnancy test) showed that overall depression is higher at oocyte retrieval and after the pregnancy test (Verhaak, *et al.*, 2007) than prior to the start of treatment. In addition, the review showed that depression levels are higher after one or more unsuccessful treatment cycles as compared with prior to the start of treatment, with 10% to 25% of women reporting clinically significant levels of depression. When treatment is successful, depression is similar to or lower than prior to the start of treatment.

In a cohort study, Boivin and Lancaster monitored depressive symptoms in 61 women undergoing IVF (i.e., the 7 initial days of ovarian stimulation, the 7 days prior to the pregnancy test, and 4 days from the pregnancy test). Results showed that depression remained stable for most of the cycle until the day of the pregnancy test, when a significant increase occurred followed by some remission by the 4th day of the outcome stage (Boivin and Lancaster, 2010).

In a cohort study, Chiaffarino analysed changes in depressive symptoms of 1792 patients undergoing IVF/ICSI, from prior to the start of treatment to the pregnancy test (Chiaffarino, *et al.*, 2011). Among those patients without depressive symptoms at the start of treatment, 68 (15.0%) women and 32 (6.2%) men developed depressive symptoms. Of these, 25 (5.5% of total) women and 10 (2.0% of total) men presented comorbidity with anxiety symptoms.

In a cohort study, Knoll and colleagues (Knoll, *et al.*, 2009) investigated depressive symptoms in 82 couples at the day of oocyte retrieval and sperm collection, after the embryo transfer, and 4 weeks after the pregnancy test. The depressive symptoms of the two members of the couple were associated at the three assessment moments. For women, depressive symptoms increased from oocyte retrieval to embryo transfer but remained stable after (i.e., to after the pregnancy test). Men's depressive symptoms remained stable across the three assessment moments.

In another cohort study, Karatas and colleagues (Karatas, *et al.*, 2011) assessed depressive symptoms prior to the start of the IVF/ICSI, during the embryo transfer, and 1 week after the pregnancy test in 50 women using preimplantation genetic diagnosis (PGD). At embryo transfer, 16% of patients scored above the cut-off score of the depression subscale of the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983); after a positive pregnancy test, 10% scored above the cut off score; and after a negative pregnancy test, 10% scored above the cut-off. Depression scores did not vary across the three assessment moments.

Depression was assessed prior to the start of treatment and 4 weeks after the pregnancy test in a cohort of 50 patients undergoing ovulation induction (OI) and 50 patients undergoing IVF (Lukse and Vacc, 1999). Prior to the start of treatment, 34% of women undergoing OI scored above the cut-off score of 13 in the Depression Adjective Checklist. After the pregnancy test, the percentage was 48%. Depression mean scores significantly increased across the two assessment moments. The percentage of women undergoing IVF that scored above the cut-off was 36% prior to the start of treatment and 40% after the pregnancy test. In this group of women, mean depression scores did not vary across the two assessment moments.

The depressive symptoms in 43 heterosexual couples who underwent one cycle of artificial insemination were investigated in a cohort study. Results showed that depressive symptoms increased significantly from the pre-treatment period to after the pregnancy test for both women and men (Berghuis and Stanton, 2002). After receiving a negative pregnancy result, 33% of men met the BDI (Beck and Beamesderfer, 1976) criteria for mild to moderated depression and an additional 7% reported moderated to severe depression. In women, 30% met the criteria for mild to moderate depression, 21% for moderate to severe depression and 2% for severe depression. The partners' BDI scores were not correlated prior to the start of treatment but a strong association emerged after the pregnancy test ($r = 0.71$).

In a cross-sectional study, the prevalence of depression at the time of semen collection in four different ART groups was assessed (Li, *et al.*, 2013). The prevalence of depression in men undergoing IUI was 14.5%, 12.4% in men undergoing IVF, 19.2% in men undergoing ICSI, and 6.2% in men undergoing testicular sperm aspiration or percutaneous epididymal sperm aspiration (TESA/PESA).

Anxiety

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Verhaak, <i>et al.</i> , 2007)	✓					✓	✓
(Boivin and Lancaster, 2010)		✓			✓	✓	
(Chiaffarino, <i>et al.</i> , 2011)	✓					✓	
(Mahajan, <i>et al.</i> , 2010)	✓		✓	✓			
(Karatas, <i>et al.</i> , 2011)	✓			✓		✓	
(Turner, <i>et al.</i> , 2013)	✓		✓		✓		

✓ indicates the time points at which the need was assessed in the studies.

The systematic review conducted by Verhaak and colleagues (Verhaak, *et al.*, 2007) showed that overall anxiety is higher at oocyte retrieval and after the pregnancy test. In addition, anxiety is higher after one or more unsuccessful treatment cycles than prior to the start of treatment. After successful treatment, anxiety is similar to or lower than prior to the start of treatment.

Daily monitoring of anxiety symptoms in 61 women undergoing IVF, showed that anxiety increased gradually until the day of the pregnancy test and then, when the results were known, had a precipitous decline that became less accentuated on the 4th day after the pregnancy test (Boivin and Lancaster, 2010).

In a cohort study, changes in anxiety symptoms of 1792 patients undergoing IVF/ICSI were assessed (Chiaffarino, *et al.*, 2011). From those patients without anxiety symptoms at the start of treatment, 41 (9.0%) women and 15 (3.0%) men developed anxiety symptoms. From these, 25 (5.5% of total) women and 10 (2.0% of total) men presented comorbidity with depressive symptoms.

In another cohort study, anxiety was assessed in 74 women who were undergoing ICSI for the first time (Mahajan, *et al.*, 2010), prior to the start of treatment, at oocyte collection, and at embryo transfer. Anxiety was significantly higher before oocyte retrieval and embryo transfer than prior to the start of treatment. No differences were observed between oocyte retrieval and embryo transfer.

In the study of Karatas on women using preimplantation genetic diagnosis (PGD), anxiety was assessed prior to IVF/ICSI, during the embryo transfer, and 1 week after the pregnancy test (Karatas, *et al.*, 2011). At embryo transfer, 53% of patients scored above the cut-off score of the STAI (Spielberger, *et al.*, 1970); after a positive pregnancy test, 50% scored above the cut-off score; and after a negative pregnancy test, 29% scored above the cut-off. There was a significant increase in anxiety from prior to the start of treatment to the embryo transfer and after the pregnancy test. This increase was similar for patients who had a negative and those who had a positive pregnancy test.

Turner and colleagues conducted a cohort study with 44 women undergoing IVF; 29 women were undergoing their first cycle and 15 were already undergoing a repeated cycle (Turner, *et al.*, 2013). Women's anxiety levels were assessed prior to ovarian stimulation, 1 day prior to oocyte retrieval, and 5 to 7 days post embryo transfer. State and trait anxiety did not vary across the three assessment moments.

Stress/distress

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Boivin and Takefman, 1996)		✓	✓	✓	✓		
(Boivin, <i>et al.</i> , 1998)		✓	✓	✓	✓	✓	
(Knoll, <i>et al.</i> , 2009)			✓	✓		✓	
(Turner, <i>et al.</i> , 2013)	✓		✓		✓		

✓indicates the time points at which the need was assessed in the study.

In the prospective cohort study that investigated the daily reactions of 20 women to an IVF cycle (Boivin and Takefman, 1996) higher stress was observed during the retrieval-transfer stage and waiting period compared with the equivalent stage in the normal menstrual cycle.

In another prospective cohort study, the same group assessed the daily emotional reactions of 40 couples undergoing one cycle of IVF/ICSI (Boivin, *et al.*, 1998). The most distressing stages for both women and men were the oocyte retrieval, embryo transfer and the pregnancy test day.

In the cohort prospective study conducted by Knoll and colleagues, stress appraisals were assessed (Knoll, *et al.*, 2009). The partners' (women and men) stress appraisals symptoms were not associated at oocyte retrieval and sperm collection but were weakly and moderately positively associated at the embryo transfer stage and 4 weeks after the pregnancy test, respectively. For women, stress appraisals increased from oocyte retrieval to embryo transfer but remained stable after (i.e., to after the pregnancy test). For men, stress appraisals remained stable across the three assessment moments.

In the study by Turner and colleagues, women's perceived stress did not vary across ovarian stimulation, oocyte retrieval, and 5 to 7 days post embryo transfer (Turner, *et al.*, 2013).

Psychiatric disorders

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Volgsten, <i>et al.</i> , 2008), 2010)			✓			✓	

✓indicates the time points at which the need was assessed in the study

A prospective cohort study investigated the prevalence of psychiatric disorders in 413 infertile women and 412 infertile men undergoing *in vitro* fertilization treatment (Volgsten, *et al.*, 2008, 2010). The diagnoses of psychiatric disorders were made in two steps. Patients first filled in a screening tool, the PRIME-MD, at the time of oocyte retrieval. To confirm the diagnosis, telephone interviews were conducted using a computerized version of the PRIME-MD clinician evaluation guide to screen-positive women and men. The interview was conducted 21 days after the screening, thus after the pregnancy test; 31% of women and 10% of men met the criteria for a psychiatric disorder. Mood disorders were

the most prevalent psychiatric disorder (26% for women and 9% for men). Within these, major depression was the most prevalent (11% for women and 5% for men). The prevalence of any anxiety disorder was 15% for women and 5% for men.

Psychiatric morbidity

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Montagnini, <i>et al.</i> , 2009)					✓		

✓ indicates the time points at which the need was assessed in the study.

In 20 couples undergoing their first IVF cycle (Montagnini, *et al.*, 2009), 25% of women, but none of the men, scored above the cut-off score of the General Health Questionnaire (GHQ-12) (Goldberg, 1972), indicating the presence of a psychiatric disorder.

Positive and negative affect

Emotional need	Treatment period						
	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(de Klerk, <i>et al.</i> , 2006)		✓	✓	✓	✓	✓	
(Mahajan, <i>et al.</i> , 2010)	✓		✓	✓			
(Boivin and Lancaster, 2010)		✓ ^a			✓ ^a	✓ ^a	

✓ indicates the time points at which the need was assessed in the study.

^a Only positive affect.

In an RCT, de Klerk and colleagues daily monitored positive and negative affect in 174 women undergoing a mild stimulation protocol and 159 women undergoing a standard stimulation protocol for IVF. Assessments were performed across one IVF cycle, from prior to the start of treatment to the waiting period (de Klerk, *et al.*, 2006). The day of oocyte retrieval was associated with more negative and less positive affect than other treatment stages. Decrease in positive affect and an increase in negative affect were observed from prior to the start of treatment to the day of the pregnancy test for all women. Women experienced less positive affect and more negative affect on the day of the pregnancy test than during treatment, especially women who were not pregnant. The effects of mild and standard stimulation protocol on affect are mentioned in the next section.

In a cohort study, Mahajan and colleagues assessed positive and negative affect prior to the start of treatment, at oocyte collection and at embryo transfer in 74 women who were undergoing ICSI for the first time (Mahajan, *et al.*, 2010). Results showed that positive affect was significantly lower before oocyte retrieval and embryo transfer than prior to the start of treatment, but no differences were observed between oocyte retrieval and embryo transfer. Negative affect significantly increased from prior to the start of treatment to before oocyte retrieval and from oocyte retrieval to the embryo transfer.

The cohort study conducted by Boivin and Lancaster, that daily monitored 61 women who did IVF, showed that positive affect declined consistently across the days of the cycle (Boivin and Lancaster, 2010).

Mood

Emotional need	Treatment period						
Mood	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Newton, et al., 2013)	✓		✓	✓			

✓ indicates the time points at which the need was assessed in the study.

Newton and colleagues conducted a cohort study to investigate mood changes in 107 women undergoing one IVF cycle and how these influenced women's preferences for single or multiple embryo transfer (Newton, et al., 2013). Women were assessed 1 month before the start of treatment and then randomly selected to be reassessed immediately before oocyte retrieval or after embryo transfer. Mood disturbance increased from baseline to the reassessment, in particular tension and anger increased and fatigue and vigour decreased.

Optimism

Emotional need	Treatment period						
Optimism	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Boivin and Takefman, 1996)		✓	✓	✓	✓		
(Boivin, et al., 1998)		✓	✓	✓	✓	✓	

✓ indicates the time points at which the need was assessed in the study.

In the cohort study that monitored daily reactions to an IVF cycle of 20 women, Boivin and Takefman observed higher optimism during the retrieval-transfer stage compared with the equivalent stage in the normal menstrual cycle (Boivin and Takefman, 1996).

The same group also monitored the daily reactions of 40 couples undergoing one cycle of IVF/ICSI and showed that men and women reported similar levels of optimism during treatment. Optimism was higher on the retrieval and transfer days than on the other days (Boivin, et al., 1998).

Grief

Emotional need	Treatment period						
Grief	Prior to treatment	Start of treatment: ovarian stimulation	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
(Lukse and Vacc, 1999)	✓					✓	

✓ indicates the time points at which the need was assessed in the study.

Grief was assessed in 50 women undergoing IVF and 50 women receiving medication for ovulation-induction prior to the start of treatment and 4 weeks after the pregnancy test (Lukse and Vacc, 1999). Grief mean scores significantly increased across the two assessment moments. This was true for both women who underwent ovulation-induction and IVF.

Conclusion and considerations

Overall, women’s depression, anxiety stress/distress, negative affect, and grief tend to increase across one IVF cycle, reaching a peak at the embryo transfer stage or prior to the treatment outcome notice. Positive affect tends to decrease across the cycle. The oocyte retrieval and embryo transfer stages are stages of high couple optimism. Emotional reactions after the treatment outcome notice are dependent on the outcome of treatment, with negative emotional reactions (mainly depression, grief, and negative affect) resulting from a negative treatment outcome.

Very little is known about the emotional needs of couples during first-line fertility treatments such as IUI.

Recommendations

<p>Fertility staff should be aware that patients’ emotional stress fluctuates during an IVF/ICSI cycle, with peaks at the oocyte retrieval, the embryo transfer, and the waiting period before the pregnancy test (<u>Boivin and Takefman, 1996; Boivin, et al., 1998; Knoll, et al., 2009; Turner, et al., 2013</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that women’s positive affect decreases during an IVF/ICSI cycle (<u>Knoll, et al., 2009; Boivin and Lancaster, 2010</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that anxiety and stress are higher when patients are anticipating results (e.g., in the waiting period before the pregnancy test, between oocyte retrieval and embryo transfer) (<u>Boivin and Takefman, 1996; Boivin, et al., 1998; Verhaak, et al., 2007; Knoll, et al., 2009</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that patients experience high emotional distress when they are informed that the treatment was unsuccessful (<u>Verhaak, et al., 2007</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that, when they are informed that the treatment was unsuccessful, 1 to 2 in 10 women experience clinically significant levels of depressive symptoms (<u>Verhaak, et al., 2007</u>).</p>	<p>B</p>
<p>Fertility staff should be aware that after receiving the pregnancy test for their IVF/ICSI treatment, 1 in 4 women and 1 in 10 men have a depressive disorder. One in 7 women and 1 in 20 men have an anxiety disorder (<u>Volgsten, et al., 2008, 2010</u>).</p>	<p>B</p>

3.1.d Cognitive needs

The available evidence about patients’ cognitive needs refer to concerns about assisted reproductive treatment and knowledge about the medical aspects of embryo cryopreservation.

Clinical evidence

Concerns

Cognitive need	Treatment period						
	Prior to treatment	Start of treatment	Oocyte retrieval	Embryo transfer	Waiting period	Pregnancy test	Ultrasound
Concerns with ART							
(Klonoff-Cohen, et al., 2007)	✓			✓			

✓ indicates the time points at which the need was assessed in the study.

The concerns about assisted reproductive treatment of 151 women undergoing IVF treatment were assessed at two different moments: prior to the start of treatment and at the embryo transfer stage (Klonoff-Cohen, et al., 2007). Four different types of concerns were assessed: procedural concerns, which included undergoing surgery, side effects from the anaesthetics, not having enough information, pain, side effects from hormones and long recovery time; finances; missing work and chance of achieving the desired result. Patients’ biggest concern was achieving the desired result, followed by the side effects of hormones, finances, and undergoing surgery. All concerns except achieving the desired result decreased from prior to the start of treatment to the embryo transfer stage.

Conclusion and considerations

Patients express moderate to high concerns about achieving the desired treatment result that do not decrease across treatment. Other procedural, financial, and work-related concerns decrease across the treatment period.

Recommendation

<p>Fertility staff should be aware that patients report moderate to high concerns about achieving pregnancy with a healthy live birth, that do not decrease across treatment (Klonoff-Cohen, et al., 2007).</p>	<p>C</p>
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Research recommendations

There is now a consensual body of knowledge about the emotional, relational, and social needs of couples during one IVF cycle. Although this literature allows us to achieve a comprehensive scenario of how these needs change across treatment, this would be further enhanced and validated by the uniformization of the measurement tools used within the field.

Not much is known about the relational, social, and emotional needs of patients during treatments less intrusive than IVF, and more research needs to be conducted to clarify whether the needs of patients undergoing these types of treatment are similar to those of patients undergoing IVF.

Finally, almost nothing is known about the behavioural and cognitive needs of patients undergoing any type of fertility treatment. Future research should focus on monitoring changes across the treatment

period in those patient behaviours that are known to affect treatment outcome (i.e., lifestyle behaviour, exercise, and nutrition, etc.). A better understanding of the different cognitive needs patients have also needs to be achieved, in particular about their concerns and level of knowledge/information and how these may affect their behaviour and decision-making during treatment for both partners of the couple.

Cohort prospective studies are probably the most appropriate studies to provide us with reliable information about all these topics. Such studies should use general measures coupled with infertility-specific well-validated tools. Of particular importance for clinical practice is to clearly define the assessment points of the studies, as patients' needs will vary according to the stage of treatment they are undergoing.

3.2 Detection of needs during treatment

Key question

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS DURING TREATMENT?

Rationale for the key question

This question describes the predictors of the needs patients experience during fertility treatment and the methods fertility staff can use to detect them. It should be noted that although compliance behaviour occurs in between treatment cycles, before starting or after finishing a cycle, it would still be reported on.

The goal is to enable staff to identify in advance those patients that are more likely to have specific needs during treatment period and who may therefore benefit from additional psychosocial support.

General recommendation

The guideline development group recommends that fertility staff use the tools listed in Appendix 2 when assessing patients' needs.

GPP

3.2.a Behavioural needs

The available evidence for predictors of patients' behavioural needs refers to treatment compliance.

Clinical evidence

Compliance

In a systematic review, Gameiro and colleagues analysed 22 studies (total sample size: 21 453 patients) investigating non-compliance via premature discontinuation of treatment ([Gameiro, et al., 2012](#)). The potential predictors for discontinuation (evaluated in 14 longitudinal studies) were categorized in those that were infertility-history related, treatment-related, and patient-related. Overall, the data showed that consistent predictors for treatment discontinuation could not be identified. Furthermore, certain factors believed to be associated with discontinuation, such as infertility duration, female age, poor ovarian response/cycle cancellation, and/or financial issues, were not found to be robust predictors of discontinuation.

In a recent systematic review and meta-analysis of compliance rates with ART treatment (10 studies, 14 810 patients), Gameiro and colleagues ([Gameiro, et al., 2013](#)) investigated whether the clinic's first and second cycle success rates were predictors of patient compliance, and found no association.

Custers and colleagues did a retrospective observational cohort study to evaluate whether baseline characteristics and prognostic profiles differed between 221 (28%) couples who discontinued intrauterine insemination (IUI) and 582 (72%) couples that continued IUI, and the reasons for couples discontinuing ([Custers, et al., 2013](#)). Discontinuation was defined as not utilizing six completed cycles if not pregnant. Older female age, longer duration of subfertility, stronger hormonal stimulation, and lower estimated chances at the start of treatment of achieving pregnancy were associated with discontinuation.

Another retrospective observational cohort investigated the medical factors associated with discontinuation of IVF after one first failed cycle (Troude, et al., 2014). Among 5135 patients who did a failed IVF cycle, 1337 (26%) did not do more cycles in a 5-year follow-up period; 3798 (74%) couples continued treatment. Predictors investigated were woman’s and man’s age, cause and duration of infertility, information of previous cycle done in the centre (number of oocytes retrieved, number of embryos obtained, transferred, frozen, number of frozen cycles done, and pregnancy). In multivariate analysis, couples in which women were aged less than 30 and more than 34, were infertile for more than 6 years, had female or unexplained infertility factor (versus male infertility factor), and who retrieved less than two oocytes in the first IVF cycle were more likely to discontinue treatment.

Conclusion and considerations

The problem of patient compliance and treatment discontinuation is of paramount importance in ART. Based on the best currently available evidence, reliable predictors of treatment discontinuation have not yet been identified. The two recent retrospective cohort studies described suggest that poor prognosis at the start of treatment may predict discontinuation, but these data were not supported in the systematic review where many non-significant associations for the same predictors were found, even in studies with sufficient power.

Recommendation

<p>Fertility staff should be aware that currently there are no reliable tools or predictors to identify patients not likely to comply with recommended treatment (Gameiro, et al., 2012).</p>	<p>B</p>
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3.2.b Relational and social needs

The available evidence concerning predictors of the relational needs of patients refers to the partner relationship. Evidence about social needs included social support, social contacts, and work-related issues (absence from work and disclosure of infertility treatment at work).

Clinical evidence

Partner relationship

A cohort study was aimed at assessing marital and sexual satisfaction of 207 women, 3 to 12 days before the start of treatment and 3 weeks after the pregnancy test(Verhaak, et al., 2001). In this study, it was shown that the type of treatment (IVF versus ICSI) was not associated with marital and sexual satisfaction.

Another prospective cohort study assessed the daily emotional reactions of 40 couples undergoing one cycle of IVF/ICSI, from the first day of ovarian stimulation to the day of the pregnancy test (Boivin, et al., 1998). Results showed that women reported less intimacy than men did during the last days of the waiting period to know the result of the treatment.

Social support

Another prospective cohort study evaluated the social support perceived by couples during one cycle of ART (Agostini, et al., 2011). Social support was assessed in relation to a significant other, family and friends, (and overall total) at the start of ovarian stimulation, upon oocyte retrieval, and 1 month after

the embryo transfer, which was around 2 weeks after the pregnancy test. At the start of the ovarian stimulation and during oocyte retrieval, men reported lower perceived support than women did from a significant other, their friends, and in total. One month after the embryo transfer, men reported lower support than women did from a significant other and in total. No gender differences regarding perceived support from family members were found.

Social contacts

Social contacts were assessed in the prospective cohort study by Boivin and colleagues, that recorded the daily emotional reactions of 40 couples undergoing one cycle of IVF/ICSI (Boivin, *et al.*, 1998). Results showed that overall women report more contact with family and friends than men, especially during the first and last days of the IVF cycle. This difference in social contacts was smaller prior and during the retrieval stage of the IVF cycle.

Absence from work

A multicentre cohort study followed 380 women with a paid job while they underwent a standard IVF cycle, more precisely from the first day of ovarian stimulation until 10 weeks thereafter, which is around 4 weeks after the pregnancy test (Bouwman, *et al.*, 2008). Women were asked to fill in the Health and Labour Questionnaire (HLQ) daily, reporting the number of hours they were absent from work. In this study, the number of hours of paid work was associated with IVF-related absence from work. Furthermore, women with secondary education reported more IVF-related absence from work than women with higher education. Women with physical or emotional complaints due to IVF reported more hours of IVF-related absence from work than women without those complaints.

Disclosure of infertility treatment at work

A cross-sectional study was performed with 199 patients undergoing infertility treatment to investigate the demographic profile of women more likely to disclose to their employer their infertility and the fact that they are undergoing treatment (Finamore, *et al.*, 2007). Women of a higher level of education (postgraduate vs college vs high school) and women having their first visit to an infertility specialist were less likely to disclose. There were some indications that women that were required to have more days out of work, and that women with a female supervisor were also more likely to disclose than women with short-term absence from work or women with male supervisors, respectively. Race, ethnicity, religion, pregnancy loss, and infertility-related stress were not associated with whether the patients would disclose or not.

Conclusion and considerations

In general, men seem to be more isolated than women are during IVF/ICSI treatment. Undergoing treatment is associated with significant absence from work. Women with lower education and women who have physical or emotional health problems report longer absence from work when undergoing IVF, as compared with women with higher education and no health problems, respectively. The data suggest that women may perceive barriers to disclosing to their employer that they are undergoing fertility treatment, but this is not yet well studied.

Overall, relatively few studies have specifically investigated predictors of the relational and social needs of patients during treatment.

Recommendations

<p>Fertility staff should be aware that at the start of ovarian stimulation, at oocyte retrieval, and after the pregnancy test, men report lower perceived support than women (Agostini, et al., 2011).</p>	<p>C</p>
<p>Fertility staff should be aware that men report higher social isolation than women during an IVF/ICSI treatment cycle (Boivin, et al., 1998).</p>	<p>C</p>
<p>Fertility staff should be aware that patients with lower education level or with physical or emotional complaints due to IVF/ICSI may take more treatment-related hours off work (Bouwman, et al., 2008).</p>	<p>C</p>

3.2.c Emotional needs

The available evidence about predictors of patients’ emotional needs refers to depression, anxiety, stress/distress, psychiatric disorders and morbidity, positive and negative affect, mood, optimism, grief, and self-esteem.

Clinical evidence

Depressive symptoms

Demographic and personal characteristics

The depressive symptoms in 43 heterosexual couples who underwent one cycle of artificial insemination were investigated in a cohort study (Berghuis and Stanton, 2002). Results showed that depressive symptoms increased significantly from the pre-treatment period to after the pregnancy test for both women and men, but that this increase was bigger for women.

In a cohort study, Chiaffarino analysed changes in depressive symptoms of 1792 patients undergoing IVF/ICSI from the start of treatment to the pregnancy test (Chiaffarino, et al., 2011). Women consistently (before and during treatment) reported higher depression than men. Woman’s age, occupation, and previous IVF experience were not associated with the incidence of depressive symptoms during treatment. Similarly, age and previous IVF experience were not found to be predictors of depression during treatment in men. However, men with a temporary or part-time job reported more depressive symptoms compared with those with a full-time job.

Verhaak and colleagues implemented a cohort study following 148 women and 71 men starting their first IVF cycle, to investigate whether certain risk factors could predict the emotional response to a failed IVF or ICSI treatment cycle (Verhaak, et al., 2005). Changes in depression were not correlated with educational level, age, duration, and cause of infertility. In addition, having children also did not correlate with changes in depression levels after an unsuccessful IVF cycle. Neuroticism and helplessness were associated with increases in depression from before the start of treatment to after the pregnancy test, whereas acceptance of infertility and perceived social support were associated with decreases in depression. No significant associations were found with other personality factors

(i.e., extraversion and optimism), coping, sexual dissatisfaction, and size of the social network. In the multivariate model, neuroticism, infertility-related cognitions (helplessness and acceptance), and perceived social support were significant predictors of depression after unsuccessful treatment.

Depression was assessed prior to the start of treatment and 4 weeks after the pregnancy test in a cohort of 50 patients undergoing ovulation induction (OI) and 50 patients undergoing IVF ([Lukse and Vacc, 1999](#)). In this study, coping variables did not predict overall depression.

In a cohort study, depression was assessed in 251 women before and after (3 weeks after the pregnancy test) one ART treatment cycle ([Khademi, et al., 2005](#)). Depression scores before treatment and the duration of infertility were positive predictors of depression after treatment. A negative correlation was found between depression scores after the pregnancy test and the result of treatment. Age, education, number of previous treatments, and type of infertility were not significant predictors of post-treatment depression.

In a cross-sectional study, the depressive symptoms of 20 couples that were undergoing their first IVF cycle were assessed during the waiting period that precedes the notice of the treatment outcome ([Montagnini, et al., 2009](#)). Women presented significantly higher depression scores than men. Single-item analysis of the questionnaires showed that more women than men answered positively to the following items: depressive humour, fatigue, somatic symptoms, libido reduction, self-observation, and worries about health and libido reduction.

Zaig and colleagues implemented a cohort study to investigate depressive symptoms in women with a lifetime diagnosis of a unipolar mood or anxiety disorder, during an IVF cycle ([Zaig, et al., 2013](#)). From the 108 women recruited, 21 (20%) were diagnosed as suffering from a lifetime unipolar mood or anxiety disorder, using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID). Women with and without a diagnosis showed similar depression levels at the start of treatment, but these increased for women with a diagnosis and remained stable for women without. Of the women with a diagnosis, 24% and 48% scored above the cut-off levels for depression before the start of treatment and before the pregnancy test, respectively. These percentages were 15% and 14% in women without a diagnosis.

Diagnosis and treatment characteristics

In an RCT, de Klerk and colleagues daily monitored depression in 174 women undergoing a mild stimulation protocol and 159 women undergoing a standard stimulation protocol for IVF. Assessments were performed across one IVF cycle, prior to the start of treatment, at ovarian stimulation, and after embryo transfer ([de Klerk, et al., 2006](#)). Women in the conventional IVF group reported more depressive symptoms during ovarian stimulation than women in the mild IVF group (no down-regulation).

A cohort study evaluated the coping strategies and depressive symptoms of 43 heterosexual couples undergoing IUI, before the start of treatment and after the pregnancy test ([Berghuis and Stanton, 2002](#)). Men's' distress before treatment, low emotional processing, and their partner's high avoidant coping predicted their depression levels after the pregnancy test. Women's' distress before treatment, high avoidant coping, their partner's low problem-focused coping and positive reinterpretation, and the above-described partner interaction on emotional processing predicted their depression levels after treatment.

In a cross-sectional study, the prevalence of depression at the time of semen collection in four different ART treatment groups was assessed (Li, *et al.*, 2013). The treatment groups included IUI, IVF, ICSI, and TESA/PESA. The overall prevalence of depression was 13.3% for men undergoing ART treatments: 14.5% of IUI group, 12.4% of IVF group, 19.2% of ICSI group, and 6.2% of TESA/PESA group. The differences in prevalence between men undergoing IUI, IVF, and ICSI were not significant.

Anxiety

Demographic and personal characteristics

In the cohort study by Chiaffarino and colleagues, anxiety was assessed before treatment and after the pregnancy test (Chiaffarino, *et al.*, 2011). Women consistently (before and during treatment) reported higher anxiety than men. Age and previous IVF experience were not associated with incidence of anxious symptoms in women or men. Having a temporary job increased the risk, although non-significant.

In a cohort study, Verhaak and colleagues investigated whether certain risk factors could predict the emotional response to a failed IVF or ICSI treatment cycle (Verhaak, *et al.*, 2005). Changes in anxiety from before to after treatment were not associated with educational level, age, or duration or cause of infertility. In addition, having children also did not correlate with changes in anxiety levels after an unsuccessful IVF cycle. Neuroticism, helplessness, and marital dissatisfaction were associated with increases in anxiety from before the start of treatment to after the pregnancy test, whereas acceptance was associated with decreases in depression.

In the cohort study by Zaig, women with and without a lifetime diagnosis of a unipolar mood or anxiety disorder showed similar anxiety levels at the start of treatment but these increased for women with a diagnosis and remained stable for women without (Zaig, *et al.*, 2013).

Diagnosis and treatment characteristics

Anxiety was evaluated in 69 women randomized to either a normal sodium diet (33 women) or a sodium-restricted diet (36 women) (Beerendonk, *et al.*, 1999). The sodium-restricted diet was started 10 days before the start of ovarian stimulation and continued until the IVF cycle. There was no difference in anxiety levels between women on a normal sodium diet or a sodium-restricted diet.

Turner and colleagues conducted a cohort study with 44 women undergoing IVF; 29 women were undergoing their first cycle and 15 were already undergoing a repeated cycle (Turner, *et al.*, 2013). Women's anxiety levels were assessed prior to ovarian stimulation, 1 day prior to oocyte retrieval, and 5 to 7 days post embryo transfer. State and trait anxiety were similar for women doing a first and a repeated cycle.

Stress/distress

Demographic and personal characteristics

In a cohort study, Boivin and colleagues (Boivin, *et al.*, 1998) assessed the daily emotional reactions of 40 couples undergoing one cycle of IVF/ICSI. Results showed that, overall, women report more distress than men do during the treatment cycle.

A cohort study was performed on 342 patients undergoing IVF, to evaluate the effect of coping strategies assessed 1 to 2 days after embryo transfer (ET) on pregnancy outcome (Panagopoulou, *et al.*, 2006). Cross-sectional analyses at ET showed that infertility-specific stress was negatively associated with emotional expressive coping and positively related to avoidant coping. No other associations between distress and coping measures were found.

Diagnosis and treatment characteristics

In the study by Turner and colleagues, women's perceived stress at ovarian stimulation, oocyte retrieval, and 5 to 7 days post embryo transfer was similar for women doing a first and a repeated cycle (Turner, *et al.*, 2013).

Psychiatric disorders

The potential association between personality characteristics and psychiatric disorders in patients undergoing infertility treatment was explored in a prospective study performed in 413 women and 412 men (Volgsten, *et al.*, 2008). Significantly more women (30.8%) than men (10.2%) had a psychiatric diagnosis (PRIME-MD) in the study's sample.

in a separate publication, potential associations between patient (age, socioeconomic status, Swedish being native language, smoking, obesity, infertility duration, and cause) and treatment (negative pregnancy test, previous IVF/ICSI treatment) risk factors and psychiatric disorders were also investigated (Volgsten, *et al.*, 2010). For women, neuroticism and receiving a negative pregnancy test were associated with the presence of a psychiatric disorder. Aggressiveness, age, BMI, smoking, and previous pregnancy were not associated with a psychiatric disorder. For men, neuroticism was associated with a psychiatric disorder. Furthermore, the cause of infertility (male factor vs female factor and unexplained factor vs female factor) was shown to be associated with a psychiatric disorder. Age, socioeconomic status, number of previous IVF cycles, and type of treatment (IVF vs ICSI) were not associated with psychiatric disorders. Multiple logistic regressions showed that a negative pregnancy test, previous pregnancy, and smoking were independent risk factors for major depression in women. For men, no risk factors were identified. In addition, for women no risk factors for anxiety disorders were found. In men, a multivariate analysis was not feasible due to the small number of any anxiety disorders. Univariate analyses revealed positive associations between anxiety disorders and age, obesity, smoking, other native language, and previous IVF/ICSI treatment.

Psychiatric morbidity

Demographic and personal characteristics

In 20 couples undergoing their first IVF cycle (Montagnini, *et al.*, 2009), women reported significantly higher psychiatric morbidity than men did during the waiting period before the pregnancy test. Twenty-five per cent of women scored above the cut-off score of the General Health Questionnaire (GHQ-12), indicating the presence of a psychiatric disorder. None of the men scored above the cut-off score. Single-item analysis of the questionnaires showed that more women than men answered positively to the following items: nervousness and tension, capacity to maintain attention, sadness, and depression.

In the cohort study implemented by Zaig and colleagues, women with a diagnosis of unipolar mood or anxiety disorder consistently showed higher psychopathological symptoms (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) during an IVF cycle than women without a diagnosis (Zaig, *et al.*, 2013). These symptoms also showed a greater increase across the cycle for diagnosed women than for non-diagnosed.

Positive and negative affect

Demographic and personal characteristics

A prospective longitudinal study performed in 66 couples undergoing IVF suggested that men who provide more instrumental support to their partner after oocyte retrieval and after embryo transfer

report with higher positive affect at subsequent stages of treatment (embryo transfer and pregnancy test, respectively). Women who provide more emotional support to their partner after the embryo transfer reported lower negative affect following the pregnancy test. Neither the receipt of (instrumental or emotional) support nor reciprocity (giving and receiving) in support were reliably associated with affect changes (Knoll, *et al.*, 2009).

Diagnosis and treatment characteristics

The impact of mild ovarian stimulation during the first IVF cycle combined with single embryo transfer was investigated in an RCT comparing this strategy with a conventional stimulation followed by double embryo transfer (de Klerk, *et al.*, 2006). On the day of oocyte retrieval, women in the mild IVF group scored higher on negative affect and lower on positive affect than women in the conventional IVF group. Women in the conventional IVF group whose first treatment cycle was cancelled experienced less positive affect during treatment than women in the mild IVF group with a cancelled first cycle. Moreover, women in the conventional IVF group with a cancelled first cycle experienced less positive affect on the day their treatment was cancelled than women undergoing mild IVF. For negative affect, women undergoing conventional IVF experienced more negative affect on the day the treatment outcome became known than the mild IVF group.

Mood

Newton and colleagues conducted a cohort study to investigate mood changes in 107 women undergoing one IVF cycle and how these influenced women's preferences for single or multiple embryo transfer (Newton, *et al.*, 2013). Women were assessed 1 month before the start of treatment and then randomly selected to be reassessed immediately before oocyte retrieval or after embryo transfer. Mood changes were similar whether women were reassessed before egg retrieval or immediately after embryo transfer, whether or not women had existing children, and whether this was a first or subsequent IVF cycle.

Optimism

A small prospective study performed on 40 couples undergoing IVF treatment supported that men and women have similar levels of optimism during treatment (Boivin, *et al.*, 1998).

Grief

In a cohort study with 100 women undergoing IVF or OI, women who reported the expense of the IVF treatment to be a significant or very significant burden yielded higher scores of grief after the pregnancy test (Lukse and Vacc, 1999). Furthermore, coping variables did not seem to be able to predict grief.

Self-esteem

In 20 couples undergoing their first IVF cycle, women presented significantly lower self-esteem than men did during the waiting period before the pregnancy test (Montagnini, *et al.*, 2009). Single-item analysis of the questionnaire showed that more women than men reported feelings of helplessness.

Conclusion and considerations

The emotional needs of patients during infertility treatment vary. Women seem to be more prone to emotional maladjustment than men are. More specifically, the reviewed evidence shows that they experience higher depression, anxiety, stress, and psychiatric morbidity and lower self-esteem than men do during the treatment period.

Patients with a previous history of or vulnerability to mental health disorders (including high neuroticism) will present worse negative emotional adjustment (e.g., higher depression, anxiety, psychiatric morbidity) during treatment and if its outcome is negative.

The dose of hormonal stimulation used (mild versus standard) seems to affect women's emotional reactions during the treatment. Women using mild stimulation report lower positive affect and higher negative affect after oocyte retrieval, but lower depression during ovarian stimulation, and lower negative affect and higher positive affect if they receive a notice of treatment cancellation or failure.

Fertility-related cognitions also seem to play a role in predicting patients' emotional adjustment during treatment. Patients with high helplessness regarding their infertility condition and treatment experience more depression and anxiety after the treatment outcome. Contrary, patients with higher infertility and childlessness acceptance experience lower depression and anxiety at this time.

There is some evidence that specific factors, such as perceiving low social support, marital dissatisfaction, having a part-time job (as opposed to a full-time job), and considering the treatment too expensive, may be risk factors for poorer adjustment during treatment.

Finally, how each member of a couple reacts to and copes with infertility and its treatment will influence theirs and their partner's adjustment during treatment.

Overall, there are many dimensions of emotional maladjustment and relevant data appear heterogeneous; therefore, firm conclusions regarding reliable predictors of the emotional needs of patients during treatment should be regarded with caution.

The SCREENIVF is a validated acceptable tool to identify before the start of treatment those women that will experience emotional maladjustment at the end of the treatment cycle, after being informed of the treatment outcome.

Recommendations

Fertility staff should be aware that women are more likely to experience anxiety, depression, stress, and/or psychiatric morbidity than men (Boivin, <i>et al.</i>, 1998; Berghuis and Stanton, 2002; Verhaak, <i>et al.</i>, 2005; Montagnini, <i>et al.</i>, 2009; Chiaffarino, <i>et al.</i>, 2011).	B
Fertility staff should be aware that the number of previous treatment cycles is not associated with depression, anxiety, or incidence of psychiatric disorders for men and women undergoing treatment (Khademi, <i>et al.</i>, 2005; Volgsten, <i>et al.</i>, 2010; Chiaffarino, <i>et al.</i>, 2011; Newton, <i>et al.</i>, 2013; Turner, <i>et al.</i>, 2013).	C

<p>Fertility staff should be aware that patients undergoing mild stimulation IVF/ICSI (as opposed to standard stimulation) are more likely to experience negative emotional reactions at oocyte retrieval but less likely to experience these reactions during hormonal stimulation and after a treatment cycle cancellation or failure (de Klerk, et al., 2006).</p>	<p>C</p>
<p>Fertility staff should be aware that patients with a previous history of vulnerability to mental health disorders are more likely to experience depression, anxiety, and/or psychiatric morbidity during treatment (Zaig, et al., 2013).</p>	<p>C</p>
<p>Fertility staff should be aware that the ways women deal with their fertility problems are associated with infertility-specific distress.</p> <ul style="list-style-type: none"> • The use of avoidant coping (e.g., avoiding being amongst pregnant women) is associated with higher infertility-specific distress. • The use of emotional expressive coping (e.g., expressing feelings to significant others) is associated with lower infertility-specific distress (Panagopoulou, et al., 2006). 	<p>C</p>
<p>Fertility staff should be aware that patients with low acceptance of infertility and childlessness are more likely to experience anxiety and depression when they are informed that the treatment was unsuccessful (Verhaak, et al., 2005).</p>	<p>C</p>
<p>Fertility staff should be aware that patients who experience high helplessness regarding infertility and its treatment are more likely to experience anxiety and depression when they are informed that the treatment was unsuccessful (Verhaak, et al., 2005).</p>	<p>C</p>
<p>Fertility staff should be aware that in couples, the way one partner reacts to infertility and its treatment is associated with how the other partner reacts (Berghuis and Stanton, 2002; Knoll, et al., 2009).</p>	<p>C</p>

3.2.d Cognitive needs

The available evidence about patients' cognitive needs during treatment refers to concerns about assisted reproductive treatment.

Clinical evidence

The concerns about assisted reproductive treatment of 151 women undergoing IVF treatment were assessed at two different moments: prior to the start of treatment and at the embryo transfer stage ([Klonoff-Cohen, et al., 2007](#)). Four different types of concerns were assessed: procedural concerns, which included undergoing surgery, side effects from the anaesthetics, not having enough information, pain, side effects from hormones and long recovery time; finances; missing work; and chance of achieving the desired result. None of these four types of concerns was associated with age and education, number of cycles (one versus more than one), type of infertility, or parity.

Conclusion and considerations

Limited evidence exists regarding predictors of cognitive needs of patients during infertility treatment.

Recommendation

Fertility staff should be aware that currently there are no reliable methods or information about predictors of the concerns patients have about treatment (Klonoff-Cohen, et al., 2007).
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C

Research recommendations

Probably the most significant drawback of the available literature relevant to the detection of patients' needs during infertility treatment is the relative paucity of data and, most importantly, the substantial heterogeneity in the populations analysed, in the methods, and in the outcomes used to address similar questions. In this respect, the results of the individual studies cannot be meaningfully combined and robust conclusions cannot be drawn. Future research should move towards a hypothesis-validating format, with the use of appropriate and universally accepted tools. By using this approach, the comparability of the results of the various studies will be increased and their statistical pooling will become feasible. In this way, more solid conclusions can be drawn and potential predictors of the patients' needs during treatment, if existent, may be identified.

3.3 Addressing the needs during treatment

Key question

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS DURING TREATMENT?

This section provides a comprehensive description of the effects of psychosocial interventions that can be delivered by all fertility staff, on the patients’ behavioural, relational and social, emotional, and cognitive needs.

The goal is for staff to integrate interventions that have positive effects on the patients’ needs during treatment (i.e., during the treatment cycle, be it either first-line treatment such as AI or IUI, or ART cycles such as IVF and/or ICSI) into the daily routine care they provide at clinics.

General recommendation

The guideline development group recommends that fertility staff refer patients at risk of experiencing clinically significant psychosocial problems to specialized psychosocial care (infertility counselling or psychotherapy).	GPP
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3.3.a Behavioural needs

No interventions addressed the behavioural needs of patients during treatment. However, premature discontinuation has been identified as a need that should be addressed. Minimal care standards suggest that patients should be given the opportunity to discuss their treatment update options and receive decisional support to decide about these.

Recommendations

The guideline development group recommends that fertility staff offer patients the opportunity to discuss uptake or not of recommended treatment and receive decisional support to deliberate their choice.	GPP
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3.3.b Relational and social needs

Relational needs include interpersonal relationship and sexual functioning, and social needs include social support.

Clinical evidence

Table 3.1 summarizes the effects of the interventions identified that address patients' relational and social needs during the treatment period.

Table 3.1. The effect of interventions administered by fertility staff, on patients' relational and social needs during treatment

Intervention/ study	Relational and social needs		
	Interpersonal relationship	Sexuality problems	Social support
Nurse-led crisis intervention programme (Shu-Hsin, 2003) <i>RCT</i>	ns	ns	
Internet-based personal health record (Tuil, et al., 2007) <i>RCT</i>			ns

ns: no significant effect of the intervention on patient need.

Blank cells indicate that the intervention was not tested for that relational/social need.

Shu-Hsin Lee implemented an RCT to assess a nursing crisis intervention programme (IVF was considered the crisis) implemented by one nurse and directed at female IVF patients (Shu-Hsin, 2003). The programme included several components: a video explaining the therapeutic process (30 min); self-instructional material on hypnosis and relaxation; a 40-min video on self-hypnosis and muscle relaxation training together with a practice session; and individual cognitive-behavioural counselling (patients could express negative feelings, pressures, and psychosocial distress and counsellor provided support). Patients were encouraged to self-administer a relaxation technique on average twice a week and cognitive-behavioural counselling was offered via telephone (1-2 times/week between the embryo transfer and the pregnancy test). Patients in the control group received standard care. Results from the RCT showed no effects on the patients' relational well-being, namely on their interpersonal relationship and sexuality problems.

Tuil and colleagues performed an RCT to test an intervention based on providing male and female IVF patients with access to an internet-based personal health record (Tuil, et al., 2007). The online personal health record included: general information about infertility, the IVF treatment, and the fertility clinic; personalized information; access to the patient's own medical records; and communication options such as e-mail facilities, a discussion forum, and a chat room with other patients and physician's participation, answers, and corrections. The control group did not receive access to their online personal health record. It was found that having access to an online personal health record did not have any effects on patients' social support.

Conclusion and considerations

Interventions led by nurses and based on providing patients with an internet-based personal health record do not appear to address patients’ relational and social needs. Overall, there is a lack of interventions that could be carried out by fertility staff to address the relational and social needs of patients during treatment. However, the evidence from the previous questions (3.a and 3.b) shows that patients may experience specific needs and therefore these should be addressed. In addition, the evidence shows that the needs of both members of couples attending treatment are associated; therefore, this also needs to be taken into consideration.

Recommendations

Fertility staff should be aware that offering the currently available interactive complex interventions* is not likely to improve patient interpersonal relationships or sexual concerns (Shu-Hsin, 2003).	B
Fertility staff should be aware that providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to improve their social support (Tuil, et al., 2007).	B
The guideline development group recommends that fertility staff offer additional psychosocial care to patients with specific characteristics associated with social isolation or absence from work.	GPP
The guideline development group recommends that fertility staff actively involve both partners of the couple in the treatment process.	GPP

*Complex interventions combine: general information provision; continuity of care; opportunity to ask questions; being chaperoned; and counselling about depression and/or coping or relaxation.

3.3.c Emotional needs

Emotional needs include depression, anxiety, self-esteem, guilt or blame, life satisfaction, and general (i.e., not infertility-specific) self-efficacy.

Clinical evidence

Table 3.2 summarizes the effects of the interventions identified in five included studies.

Gürhan and colleagues performed a non-RCT to assess a nursing counselling programme implemented by two nurses and directed at female IVF patients (Gürhan, et al., 2007). The programme included: a 60-min group educational session, where information about the treatment and procedures was given and discussed; and two 20-min individual (or with partner present if indicated) interviews to evaluate and to meet coping needs. Within these interviews, participants were encouraged to talk about their feelings, concerns, psychosocial distress, and coping strategies. Relaxation techniques were also taught. In addition, support was provided by staying with the participants during the invasive procedures, and the participants were encouraged to use the relaxation techniques. The control group

received standard care. The effect of this intervention on women’s depression levels just before the embryo transfer was evaluated and no significant effects were found.

In the RCT implemented by Shu-Hsin Lee to assess a nursing crisis intervention programme directed at female IVF patients, no effects on patients’ anxiety, depression, self-esteem, or guilt were found (Shu-Hsin, 2003).

Table 3.2. The effect of interventions administered by fertility staff on patients’ emotional needs during treatment

Intervention/ study	Emotional needs		
	Depression	Anxiety	Other
Nurse-led counselling programme (Gürhan, <i>et al.</i> , 2007) <i>Non-RCT</i>	ns		
Nurse-led crisis intervention programme (Shu-Hsin, 2003) <i>RCT</i>	ns	ns	<i>Self-image/self-esteem</i> ns <i>Guilt/blame</i> ns
Nurse-led complex intervention (Terzioglu, 2001) <i>Non-RCT</i>	+ ^a	+	<i>Life satisfaction</i> +
Internet-based personal health record (Tuil, <i>et al.</i> , 2007) <i>RCT</i>	ns	ns	<i>General self-efficacy</i> ns
Embryologist-led complex intervention (van Zyl, <i>et al.</i> , 2005) <i>RCT</i>	ns	+	

+: positive effect of the intervention on well-being measure.

ns: no significant effect of the intervention on well-being measure.

^a Effect only significant for women (but not for men).

Blank cells indicate that the intervention was not tested for that well-being measure.

Terzioglu conducted a non-RCT to evaluate a complex intervention (Terzioglu, 2001). The intervention was conducted by a nurse practitioner, and targeted couples undergoing their first IVF treatment. The intervention included: delivery of detailed procedural information, including written information on treatment procedures; opportunity to ask questions, and checks of patients’ understanding; daily contact with patients between the start of ovulation induction and embryo transfer; help with any problem encountered; presence of the nurse practitioner at oocyte retrieval and embryo transfer; and finally, five counselling sessions (start of ART: cycle day 21; start of ovulation induction: cycles day 3 and 10; between oocyte retrieval and embryo transfer; and after embryo transfer). The control intervention included: general information about the procedures involved; the timetable for assisted reproductive treatment; and explanations about diagnostic procedures, including the need for blood and semen samples and the importance of dates and timing. They were subjected to standard care in all remaining respects. This complex intervention showed to decrease women’s depression (but not men’s), and to decrease all patients’ anxiety and increase their life satisfaction.

In the RCT conducted by Tuil and colleagues to test an intervention based on providing male and female IVF patients with access to an internet-based personal health record, no effects on patients’ anxiety, depression, or general self-efficacy were found (Tuil, et al., 2007).

Van Zyl and co-workers conducted an RCT to assess a complex intervention that was delivered by an embryologist and targeted female IVF patients (van Zyl, et al., 2005). The intervention included: one session of additional emotional support based on non-directive counselling skills (respect, empathy, genuineness, reflection, and interpretation); addressing patients’ concerns about treatment (e.g., what is going to happen? what emotions to expect? how will I cope? who can I contact and when be updated?); a list of positive self-statements in coping; and daily phone calls from the embryologists early in the morning, between oocyte retrieval and embryo transfer. The control group received standard care (no counselling or emotional support) and were asked to phone the gynaecologist daily concerning embryo development. The effect of this intervention on women’s anxiety and depression was investigated and a positive effect was found for anxiety.

Conclusion and considerations

Complex interventions led by nurses and/or embryologists, and interventions based on providing patients with an internet-based personal health record, do not appear to have an effect on patients’ depression. Evidence about the effect of these interventions on anxiety is mixed. Overall, there is a lack of interventions that could be carried out by fertility staff to address the emotional needs of patients during treatment. Therefore, patients should at least be offered access to specialized psychosocial support services. Furthermore, because the needs of both members of couples attending treatment are associated, both members should be involved in the treatment process.

Recommendations

<p>Fertility staff should be aware that offering the currently available complex interventions* is not likely to improve patients’ depression levels (Shu-Hsin, 2003; van Zyl, et al., 2005; Gürhan, et al., 2007).</p>	<p>B</p>
<p>Fertility staff should be aware that providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to improve their emotional well-being (anxiety, depression, and self-efficacy) (Tuil, et al., 2007).</p>	<p>B</p>
<p>The guideline development group recommends that fertility staff offer additional psychosocial care to patients with specific characteristics associated with negative emotional reactions.</p>	<p>GPP</p>
<p>The guideline development group recommends that fertility staff actively involve both partners of the couple in the treatment process.</p>	<p>GPP</p>

*Complex interventions combine: general information provision; continuity of care; opportunity to ask questions; being chaperoned; and counselling about depression and/or coping or relaxation.

3.3.d Cognitive needs

Cognitive needs included knowledge about fertility and its treatment.

Clinical evidence

Knowledge about fertility and its treatment

In the RCT implemented by Tuil to test an intervention based on providing male and female IVF patients with access to an internet-based personal health record, no increase of the patients' knowledge about infertility and its treatment was observed (Tuil, *et al.*, 2007).

Conclusions and considerations

Interventions based on providing patients with an internet-based personal health record do not appear to address patients' cognitive needs. Overall, there is a lack of interventions that could be carried out by fertility staff to address the cognitive needs of patients during treatment. Evidence from the previous questions (3.a) shows that patients have significant concerns about the success of treatment and they should have the opportunity to discuss them.

Recommendations

Fertility staff should be aware that providing IVF/ICSI-patients with access to an internet-based personal health record is not likely to increase their knowledge about infertility and its treatment (Tuil, <i>et al.</i>, 2007).	B
The guideline development group recommends that fertility staff offer patients the opportunity to discuss and clarify their treatment-related concerns.	GPP

Research recommendations

Overall, there is a lack of interventions that can be delivered by fertility staff to address the needs of patients during treatment. This is problematic in light of the evidence highlighting that patients experience several different needs during this stage of their treatment pathway. In particular, interventions are needed to promote treatment compliance and patient relational (e.g., social support) and emotional (e.g., negative emotional reactions during the waiting period) well-being during treatment.

Overall, as already noted in section 1.c, the interventions tested were quite complex, integrating different care components that were loosely defined. This makes it very difficult to test whether any of the different components might be effective (due to positive effects being masked by neutral and/or negative ones) and, if so, which. Future research needs to first pilot single specific care components and only integrate those shown to be efficient in more complex interventions.

Many intervention studies were not included because they did not meet the minimum quality criteria. For instance, some interventions did not use a control group and did not implement repeated assessments (at the minimum, one assessment before the interventions and another after). Other

issues rarely considered were blinding procedures (i.e., ensure that the researcher was blind for the treatment allocation), use of valid assessment measures, and reporting of dropout rates. Only two studies applied intention-to-treat analysis. Examples of interventions excluded because of these issues were a phone-based intervention provided by infertility counsellors and an intervention based on expressive writing (Matthiesen, *et al.*, 2012).

As already mentioned in section 2.3, it is crucial that future research directed at validation of psychosocial interventions use randomized controlled trials (RCTs) and evaluate procedural issues in the implementation of these interventions (so that effectiveness from feasibility and from acceptance can be differentiated), as well as patient acceptance.

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4. PSYCHOSOCIAL CARE OF PATIENTS AFTER TREATMENT

Introduction

The after-treatment period refers to the period starting 1 year after patients undergo their last treatment cycle. The existing literature on the after-treatment period focuses on two groups of patients: people who did not conceive with treatment (i.e., unsuccessful treatment) and people who conceived (i.e., successful treatment that results in pregnancy). In the case of unsuccessful treatment, the after-treatment period extends indefinitely into the future. Therefore, the wording 'short term' will be used to refer to the period from 1 to 2 years after treatment, and 'long term' to refer to the period that starts 2 years after treatment. In the case of pregnancy achieved via treatment, the after-treatment period refers only to the pregnancy period.

We did not include the first post-treatment year in the after-treatment period and therefore excluded a specific group of patients from this guideline, namely patients who experienced a negative fertility treatment outcome and who are still trying to decide whether to continue or discontinue treatment. This is a very heterogeneous group of patients who are likely to have a very heterogeneous set of needs.

4.1 Needs of patients after treatment

Key question

WHAT ARE THE NEEDS OF PATIENTS AFTER TREATMENT?

Introduction

This question describes the needs patients experience after fertility treatment. The goal is to increase staff awareness about the needs of patients that are specific to the post-treatment period, subdivided into unsuccessful and successful treatment.

4.1.A UNSUCCESSFUL TREATMENT

4.1.A.a Behavioural needs

The available evidence about the behavioural needs of patients after unsuccessful treatment refers to health behaviour.

Clinical evidence

Health behaviour

In a Swedish cross-sectional study by Johansson and colleagues, 115 couples (149 women and 121 men) who terminated unsuccessful IVF (standard three cycles) 4 to 5.5 years earlier were compared with a control group of 88 couples (118 women and 93 men) with children (adopted, spontaneously conceived) aged between 4 and 5.5 years ([Johansson, et al., 2009](#)).

At the time of assessment, 76.7% of the ART couples had children or lived together with children. Couples who underwent unsuccessful IVF treatment reported using sleeping pills more often than the control group of couples who had children (4.8% vs 0.9%). No differences were found for sick leave uptake and use of medical care, medication, and alcohol.

Conclusion and considerations

One study compared health behaviours in couples after unsuccessful IVF treatment with controls. There was no difference in behaviours except for use of sleeping pills, which were used more often by couples who underwent unsuccessful treatment. Due to the limitations of this study (i.e., 77% of couples after unsuccessful treatment had children, and the lack of normative data), it is impossible to conclude if the differences observed are due to the impact of failed fertility treatment or due to some other reason, for instance fewer behavioural constraints associated with childlessness.

Recommendations

None.

4.1.A.b Relational and social needs

The available evidence about the relational needs of patients after unsuccessful treatment refers to their relationship with their partner. No evidence is available on the social needs of these patients.

Clinical evidence

Relationship with partner/spouse

In a cohort study by Sydsjo and colleagues, 45 childless couples whose first IVF cycle failed were assessed at the start of treatment, 6 months after the first failed IVF cycle (data not considered) and 1.5 years after the last treatment cycle (Sydsjo, *et al.*, 2005). The ENRICH Marital Inventory was used to assess marital dynamics. This instrument includes 10 subscales that assess different aspects of the marital dynamics. Both men and women reported that their marital relationship was similar or better 1.5 years after treatment than at the start of treatment, across the different ENRICH subscales; that is, 1.5 years after treatment the mean ENRICH scores of the women and men who underwent unsuccessful IVF were higher than the normative data of a Swedish population within the fertile age range.

In the previously mentioned cross-sectional study by Johansson and colleagues, couples who underwent unsuccessful IVF reported fewer separations/divorces than the control group of couples who had children (6.3% vs 12.3%) (Johansson, *et al.*, 2009).

Conclusion and considerations

The short-term quality of the marital relationship of patients after unsuccessful IVF treatment seems similar or better than at the start of treatment, and better than norms.

Qualitative research reviewed (but not included due to being considered low quality evidence) suggests that these couples may experience sexual difficulties after treatment termination, and that patients from Western countries may report temporally holding off social contact in

general (Daniluk, 2001; Johansson and Berg, 2005; Volgsten, *et al.*, 2010). However, these findings have not yet been replicated in quantitative research.

In conclusion, there is a lack of research investigating the long-term marital relationship of patients after unsuccessful treatment. In addition, there is no information about the long-term effects of unsuccessful fertility treatment on patients' relationship with their family, friends and larger social network, and their work.

Recommendation

Fertility staff should be aware that about 2 years after unsuccessful IVF/ICSI treatment patients are generally satisfied with their marital relationship (Sydsjo, <i>et al.</i>, 2005; Johansson, <i>et al.</i>, 2009).

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4.1.A.c Emotional needs

The available evidence about the emotional needs of patients after unsuccessful treatment refers to anxiety, depression, emotional well-being, and psychiatric disorders.

Clinical evidence

Anxiety and depressive symptoms

Verhaak and colleagues followed 298 women undergoing IVF treatment, from before the start of treatment and after each treatment cycle (up to three cycles, data not considered for this question) up to 3 to 5 years after the patients' last treatment cycle (Verhaak, *et al.*, 2007b). Anxiety was measured with the STAI and depression with the BDI. Women who underwent unsuccessful treatment reported anxiety and depression levels 3 to 5 years after treatment similar to those reported before treatment, whereas women who conceived reported a decrease in their anxiety and depressive symptoms.

Emotional well-being

Verhaak and colleagues systematically reviewed the literature published between 1978 and December 2005 on the emotional adjustment of women who had undergone IVF treatment at least 6 months earlier (Verhaak, *et al.*, 2007a). Six studies met their inclusion criteria, of which three focused on people whose treatment was unsuccessful. One study found higher levels of depressive symptoms in the women who had not conceived through fertility treatment, 6 months to 2.5 years earlier than in couples who conceived spontaneously or through fertility treatment. A second study also reported that women had more general distress 2 years or longer after unsuccessful treatment, compared with norms. In contrast, a cross-sectional study compared women who had experienced unsuccessful treatment 2.5 to 3.5 years earlier with women who had undergone successful treatment, and did not find any differences in non-psychotic psychopathological symptoms. The reviewers noted that these studies used different control groups and considered different follow-up periods, which could explain the difference in results.

In the previously mentioned cross-sectional study by Johansson and colleagues, the Psychological General Well-Being Index was used to measure subjective well-being

([Johansson, et al., 2009](#)). The scale is divided into six domains: anxiety, depression, positive well-being, self-confidence, general health, and vitality. Couples who underwent unsuccessful IVF 4 to 5.5 years earlier reported significantly lower scores than the control group of couples who had children, on all domains except vitality on which they scored higher than controls.

Conclusion and considerations

The reviewed evidence about the emotional needs of patients after unsuccessful IVF treatment is limited and the results are mixed, with results suggesting more emotional problems in the short-term than in the long-term period after treatment. The heterogeneity in the studies' designs and methods, in particular the composition of the control group and the follow-up periods considered, do not allow definitive conclusions to be reached.

Recommendations

None.

4.1.A.d Cognitive needs

We did not find any evidence about the cognitive needs of patients after unsuccessful fertility treatment.

Conclusion and considerations

Qualitative research suggests that patients after unsuccessful fertility treatment may still have unanswered questions about their fertility problems, in particular about the cause and prognosis of their problems. However, we could not find any high quality studies, and therefore we cannot present reliable conclusions or recommendations as to the cognitive needs of couples after unsuccessful fertility treatment.

Recommendations

None.

Research recommendations

Prospective observational studies following couples from the start of treatment and considering long-term follow-ups are needed to improve understanding of the short- and long-term changes in the needs of patients who undergo unsuccessful treatment. Such studies need to be based on theoretical frameworks that allow for the identification of the relevant needs from a health and/or developmental perspective. A limitation of current research, that needs to be addressed, is the use of self-report methods to measure health and lifestyle behaviours, which are problematic due to social desirability and/or memory bias.

When considering the relational and emotional needs of couples, comparisons with population norms are advised in order to establish the clinical relevance of the outcomes reported. Qualitative research suggests that people may also report positive outcomes after unsuccessful treatment, including personal growth and strengthened self-esteem ([Daniluk, 2001](#); [Johansson and Berg, 2005](#)). This suggests that the possible benefits of undergoing treatment (independently of outcome) should be further investigated.

4.1.B PREGNANCY AFTER TREATMENT

4.1.B.a Behavioural needs

The available evidence for patients' behavioural needs during pregnancy achieved with fertility treatment refers to lifestyle behaviour.

Clinical evidence

Lifestyle behaviour

Fisher and colleagues conducted the Parental Age and Transition to Parenthood Australia (PATPA) Study to establish in what ways maternal age and mode of conception are associated with health behaviours, health service use, and self-rated physical (assessed with SF-12) and mental health (STAI and the Edinburgh Postnatal Depression Scale) during pregnancy (Fisher, *et al.*, 2013). In this prospective study, women who were at least 28 weeks pregnant and who had either conceived through ART ($n = 297$) or spontaneously ($n = 295$) were assessed through completion of questionnaires and a follow-up telephone interview. The women that conceived through ART, as compared with spontaneous conception, were significantly older (35.37 vs 32.05 years), more often had private health insurance (87.9% vs 69.5%), and were more often expecting multiples (7.7% vs 1.7%). Pregnant women after ART reported using any prescription medication (18.2%), using any over-the-counter medication (49.8%), smoking (2.0%), using any alcohol (16.3%), and exercising at least weekly (92.9%). Women that were pregnant after spontaneous conception made similar reports, except for over-the-counter medications (predominantly nutritional supplements) which were used by only 40.7% of these women.

Conclusion and considerations

One study reported overall lifestyle in women that are pregnant after ART, with low rates of smoking and alcohol consumption, and high rates of regular exercising. Health behaviour was very similar to that of pregnant women who conceived spontaneously, except for higher rates of use of over-the-counter medications, predominantly nutritional supplements. The authors explained this difference as reflecting high consciousness of foetal health in women who achieve pregnancy with fertility treatment.

Recommendations

Fertility staff should be aware that women who achieve pregnancy with fertility treatment practice lifestyle behaviours that are similar to women who conceive spontaneously (Fisher, <i>et al.</i>, 2013).
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4.1.B.b Relational and social needs

The available evidence for patients' relational needs during pregnancy achieved with fertility treatment refers to relationship with partner and antenatal attachment to the foetus. Social needs include social support.

Clinical evidence

Relationship with spouse/partner

Hammarberg and colleagues performed a systematic review focusing on the psychological and social aspects of pregnancy, childbirth (data not considered), and the 1st year after conception with ART (data not considered) (Hammarberg, *et al.*, 2008). Studies were included if they had investigated perinatal psychological or social functioning of patients after ART treatment (i.e., IVF, ICSI with fresh or cryopreserved embryos, and GIFT). The review included eight peer-reviewed studies that assessed the quality of the marital relationship during pregnancy. Three studies indicated that the marital relationship of ART couples was better than that of couples who had conceived spontaneously, two studies that it was similar, and three studies that it was worse.

In the previously mentioned PATPA study by McMahon and colleagues, quality of the partner relationship was measured with the Intimate Bonds Measure (IBM; Wilhelm and Parker, 1988) (McMahon, *et al.*, 2011). This questionnaire consists of two subscales: the Care dimension, which assesses warmth and affection expressed by the partner, and the Control dimension, which assesses control and criticism expressed by the partner. No differences were found between women who had conceived with ART and women that conceived spontaneously.

Antenatal attachment to the foetus

The systematic review conducted by Hammarberg and colleagues included seven papers in which antenatal attachment to the foetus was assessed (Hammarberg, *et al.*, 2008). Four studies found no differences in antenatal attachment to the foetus between women who conceived through ART and women who conceived naturally. In contrast, one study reported that women after ART formed a more intense protective attachment to the foetus during the pregnancy than women that conceived spontaneously, whereas the two remaining studies found that women pregnant after ART delayed preparation of a baby room and had 'fewer conversations' with the foetus. Finally, the review reported similar paternal-foetal attachments between fathers of ART and spontaneously conceived babies.

Karatas and colleagues assessed 21 Australian women who used preimplantation genetic diagnosis (PGD) at 24 weeks of pregnancy (Karatas, *et al.*, 2011) and compared them with normative population data and a control group of women who conceived with IVF. Antenatal attachment to the foetus was assessed with the Antenatal Attachment Questionnaire, in terms of quality of the relationship and time spent thinking about the foetus. Maternal antenatal attachment to the foetus did not differ from that of a norm group of spontaneously conceiving women. In contrast, women who used PGD reported spending more time thinking about the foetus (but time of similar quality) than women who conceived with IVF.

In the PATPA study by McMahon and colleagues, maternal-foetal attachment was assessed with the Maternal-Fetal Attachment Scale (MFAS) (McMahon, *et al.*, 2011). Women who had

conceived through ART reported a more intense emotional attachment to their foetus than spontaneously conceiving women, after controlling for demographic, psychosocial, and reproductive history variables.

Hjelmstedt and Collins assessed 53 fathers who had conceived with IVF and 36 fathers who had conceived spontaneously at 26 weeks of pregnancy ([Hjelmstedt and Collins, 2008](#)). Paternal attachment to the foetus was assessed with a modified version of the MFAS. Foetal attachment during pregnancy did not differ between fathers who conceived with IVF and that of fathers who conceived spontaneously.

Chen and colleagues assessed 60 infertility-treated pregnant women and 65 spontaneously pregnant women that were recruited at two obstetric clinics in central Taiwan ([Chen, et al., 2011](#)). All women were pregnant for more than 28 weeks. Maternal attachment to the foetus was assessed with the Taiwanese version of the MFAS. Women who were pregnant via fertility treatment reported higher attachment to the foetus than those spontaneously pregnant.

Conclusion and considerations

The available evidence about the quality of the marital relationship of couples who achieved pregnancy with ART treatment is mixed, with some studies reporting it is higher, some reporting it is lower, and some reporting it is the same as in couples who conceived spontaneously. Attachment to the foetus appears to develop normally in most couples who are pregnant after fertility treatment. One cohort study suggests that mothers of twins conceived through IVF rate their marital relationship as being of lower quality and perceive less social support during pregnancy than mothers of spontaneously conceived twins.

Recommendations

Fertility staff should be aware that the way patients relate to their foetus is similar whether the foetus is conceived with ART treatment or spontaneously (Hammarberg, et al., 2008; Hjelmstedt and Collins, 2008; Karatas, et al., 2011).	C
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4.1.B.c Emotional needs

The available evidence for patients' emotional needs during pregnancy achieved with fertility treatment includes anxiety and depression, emotional well-being, psychiatric disorders, self-esteem, maternal stress, and maternal self-efficacy.

Clinical evidence

Anxiety and depressive symptoms

The previously mentioned systematic review conducted by Hammarberg and colleagues included 16 papers in which self-reported symptoms of either anxiety or depression during pregnancy achieved with ART treatment had been assessed ([Hammarberg, et al., 2008](#)). There was consistent evidence that couples who conceived with ART report few depressive symptoms during pregnancy and rarely score above clinical cut-off scores. Four studies found no differences in depressive symptoms between couples who conceived through ART and

couples who conceived spontaneously. In two studies, ART couples reported fewer antenatal depressive symptoms than couples who conceived spontaneously, or norms. One study reported higher depression scores in women pregnant with multiples after ART, compared with spontaneously conceiving women (single or multiple pregnancy) or women pregnant with a singleton after ART. The level of self-reported anxiety seems to be similar in couples who conceive with ART and those who conceive spontaneously. However, two studies reported that specific anxiety about the survival of the foetus is heightened in women who conceive with ART.

In the previously mentioned PATPA study by McMahon and colleagues, anxiety was measured with the STAI and the 'Anxiety concerning Health and Defects in the Child' scale of the Baby Schema questionnaire, whereas depression was measured with the Edinburgh Postnatal Depression Scale (EDS) (McMahon, *et al.*, 2011). Women who had conceived with ART reported fewer depressive symptoms and state anxiety, but more pregnancy-specific anxiety, than spontaneously conceiving women. These effects disappeared after controlling for demographic, psychosocial, and reproductive history variables. A subsequent study by Fisher and colleagues reported the same data for the same cohort (Fisher, *et al.*, 2013).

Karatas and colleagues assessed 21 Australian women who had used preimplantation genetic diagnosis (PGD), prior to the start of IVF/ICSI treatment and once they achieved pregnancy, at 24 weeks of pregnancy (Karatas, *et al.*, 2011). The STAI and the HADS depression subscales were used to assess state anxiety and symptoms of depression, respectively. Women reported the same symptom levels during pregnancy as before starting treatment.

Emotional well-being

In the previously mentioned PATPA studies by McMahon and colleagues, the Mental Component Summary (MCS) of the SF-12 was used to measure emotional health (McMahon, *et al.*, 2011) (Fisher, *et al.*, 2013). No differences were found between women who conceived with ART and those who conceived spontaneously.

Psychiatric disorders

Vilksa and colleagues assessed parents of 91 pairs of twins and of 367 singletons conceived with ART, as well as a control group of parents of 20 pairs of twins and of 379 singletons conceived spontaneously, at 18–20 weeks of gestation (Vilksa, *et al.*, 2009). Mental health was assessed with the General Health Questionnaire (GHQ-36), which can be used to identify minor psychiatric disorders in the general population and is composed of four subscales: anxiety, depression, sleeping difficulties, and social dysfunction. Mothers of twins conceived with ART reported fewer depressive symptoms than mothers of spontaneously conceived twins. Similarly, mothers of singletons conceived with ART reported fewer depressive symptoms than mothers of spontaneously conceived singletons. No differences were found for anxiety, sleeping difficulties, and social dysfunction. No differences were found between fathers of twins conceived with ART and fathers of spontaneously conceived twins, across all GHQ-36 subscales.

Self-esteem

The systematic review conducted by Hammarberg and colleagues included six papers in which self-esteem in pregnancy was assessed (Hammarberg, *et al.*, 2008). From these papers, five showed that women who conceived with ART reported similar or higher self-esteem than women who conceived spontaneously. In one study, 25 women who had conceived with ART reported lower self-esteem than women who had conceived spontaneously.

Conclusion and considerations

Overall, most studies suggest that women who conceive with fertility treatment do not experience more emotional problems or worse self-esteem or mental health during pregnancy than women who conceive spontaneously. However, specific anxiety regarding the survival of the foetus may exist.

The evidence on women pregnant with twins (or multiples) is scarce and inconsistent, with one study reporting more maternal stress and lower maternal self-efficacy, another reporting better mental health (i.e., fewer depressive symptoms), and a third suggesting more depressive symptoms during pregnancy in women pregnant with twins after fertility treatment than in mothers of spontaneously conceived twins.

Research on fathers after successful fertility treatment is scarce, but it suggests that they have emotional needs similar to those of fathers after spontaneous conception.

Recommendations

Fertility staff should be aware that women who conceived with IVF/ICSI do not experience more symptoms of depression, worse self-esteem or worse mental health during pregnancy than women who conceive spontaneously (Hammarberg, <i>et al.</i>, 2008; Vilska, <i>et al.</i>, 2009; McMahon, <i>et al.</i>, 2011).	A
Fertility staff should be aware that women who conceived with IVF/ICSI may experience more pregnancy-specific anxiety than women who conceived spontaneously (Hammarberg, <i>et al.</i>, 2008).	B

4.1.B.d Cognitive needs

The available evidence for patients' cognitive needs during pregnancy achieved with fertility treatment refers to expectations about motherhood.

Clinical evidence

Expectations about motherhood

Baor and Soskolne assessed 88 mothers of IVF-conceived twins and 98 mothers of spontaneously conceived twins at weeks 33-37 of pregnancy (Baor and Soskolne, 2010). The nature of the prenatal expectations regarding the infant and the maternal role were assessed with the Prenatal Maternal Expectations Scale (PMES). During pregnancy, mothers who had

conceived with IVF reported more positive prenatal expectations than mothers who had conceived spontaneously. However, the mean (M) PMES-score of the IVF mothers (M = 184.1, SD = 17.1) suggested that their expectations may have been unrealistic, as this score was high compared with normal scores (PMES cut-off score = 177).

Conclusion and considerations

No studies were found assessing the cognitive needs in women pregnant with singletons after fertility treatment. One study suggests that IVF twin mothers have more unrealistic, positive, prenatal expectations than spontaneously conceiving twin mothers.

Recommendations

Fertility staff should be aware that women with multiple pregnancies after IVF/ICSI may have higher maternal expectations than women with spontaneous multiple pregnancies (Baor and Soskolne, 2010).

C

Research recommendations

More research on psychosocial needs during pregnancy after fertility treatment is needed, in particular on the needs of men and the needs of couples pregnant with multiples. The inconsistencies in the existing research are probably due to differences in research methods; studies have used different inclusion and exclusion criteria, measures, and control groups. Therefore, research findings may not be generalizable to all couples receiving fertility treatment. Couples who are pregnant through fertility treatment are generally older, experience more pregnancy complications, and are more often pregnant with multiples. Although such factors are likely to influence psychosocial adjustment, they are not always taken into account in the existing research. Differences in the timing of measurements during pregnancy may also influence outcomes. Future studies should be more inclusive and use reliable and validated measures. The use of the same research methods would improve the comparability of studies in this field.

4.2 Detection of needs after treatment

Key question

HOW CAN FERTILITY STAFF DETECT THE NEEDS OF PATIENTS AFTER TREATMENT?

Introduction

This question describes the predictors of the psychosocial needs experienced by patients after fertility treatment and the methods fertility staff can use to detect them.

The goal is to enable staff to identify in advance those patients that are more likely to have specific needs during the after-treatment period and who may therefore benefit from additional psychosocial support.

General recommendation

The guideline development group recommends that fertility staff use the tools listed in Appendix 2 when assessing patients' needs.

GPP

4.2.A UNSUCCESSFUL TREATMENT

4.2.A.a Behavioural needs

The available evidence about the predictors and methods to detect the behavioural needs experienced by patients after unsuccessful fertility treatment refers to health behaviour.

Clinical evidence

Health behaviour

In a Swedish cross-sectional study by Johansson and colleagues, 115 couples (149 women and 121 men, 115 couples) who had terminated unsuccessful IVF 4 to 5.5 years earlier were compared with a control group of 88 couples (118 women and 93 men, 88 couples) with spontaneously conceived children aged between 4 and 5.5 years (Johansson, *et al.*, 2009). At the time of assessment, 76.7% of the ART couples had children or lived together with children (either biological children mostly after additional treatments in private clinics, adopted children, foster children, or their partners' children). Of the participants who underwent IVF treatment, those without children ($n = 63$) more often reported the use of sleeping pills (12.7% vs 2.4%) and smoking (31.7% vs 11.6%), and consumed more alcohol (4.2 glasses vs 2.5) than those with children ($n = 207$).

Conclusion and considerations

One cross-sectional study suggests that not having or living with children after unsuccessful IVF treatment may be associated with a more frequent use of sleeping pills, smoking, and alcohol consumption.

Recommendation

Fertility staff should be aware that former patients who remain childless 5 years after unsuccessful IVF/ICSI treatment may use more sleeping pills, smoke more often, and consume more alcohol than former patients that become parents via adoption, or spontaneously (Johansson, et al., 2009).	C
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4.2.A.b Relational and social needs

The available evidence about the predictors and methods to detect the relational needs experienced by patients after unsuccessful fertility treatment refers to the partner relationship. No evidence about the social needs of patients is available.

Clinical evidence

Partner relationship

In the previously mentioned study by Johansson and colleagues, the participants who underwent unsuccessful IVF treatment and had no children ($n = 63$) reported more separations than people who did have children after unsuccessful IVF treatment (via adoption or spontaneously) ($n = 207$) (12.7% vs 4.3%) ([Johansson, et al., 2009](#)).

Conclusion and considerations

Limited evidence, based on a single study, suggests that having or living together with children after unsuccessful IVF treatment might be associated with fewer separations than having no children.

Recommendations

Fertility staff should be aware that former patients that remain childless 5 years after unsuccessful IVF/ICSI treatment are three times more likely to separate than former patients that become parents via adoption, or spontaneously (Johansson, et al., 2009).	C
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4.2.A.c Emotional needs

The available evidence about the predictors and methods to detect the emotional needs experienced by patients after unsuccessful fertility treatment refers to adjustment and psychiatric disorders.

Clinical evidence

Emotional adjustment

Verhaak and colleagues studied 298 women who had received IVF treatment 3 to 5 years earlier (Verhaak, *et al.*, 2007b). Women who had not conceived and still desired pregnancy (i.e., persisted with treatment or passively longed for a child) experienced more symptoms of anxiety and depression than women who had abandoned their pregnancy desire (i.e., they were pursuing other ways of having a child or searching for new life goals). These differences remained when women who already had a child before treatment were excluded from the analyses. Of the women who did not conceive with IVF, those who already had children before treatment reported fewer symptoms of anxiety and depression than those who did not.

In the previously described study by Johansson and colleagues, the Psychological General Well-Being Index was used as a measure of subjective well-being (Johansson, *et al.*, 2009). The scale is divided into six domains: anxiety, depression, positive well-being, self-confidence, general health, and vitality. Patients who underwent unsuccessful IVF treatment and had no children had lower scores than the subgroup with children, on all domains, as well as on overall subjective well-being. No gender differences were observed for well-being (Johansson, *et al.*, 2010).

Psychiatric disorders

In a cohort study by Yli-Kuha and colleagues, hospitalizations due to psychiatric disorders were investigated in 9175 Finnish women who had received IVF, ICSI, or frozen embryo treatment (FET) treatment 10 years earlier (between 1996 and 1998) (Yli-Kuha, *et al.*, 2010). Controls matched by age and municipality were randomly taken from the Social Insurance Institution's population register. Marital status and socio-economic position were adjusted in the analysis. Hospitalization episodes before and after infertility treatment were searched for in the Hospital Discharge Register. Diagnoses of psychiatric disorders were reported according to the International Classification of Diseases (8th to 10th editions). The diagnoses were divided into eight categories: psychotic disorders, depression, bipolar disorder or mania, anxiety disorder (including obsessive-compulsive disorder, dissociative disorders, somatization disorder, and other neurotic disorders), personality disorder, eating disorder, alcohol or other intoxicant abuse, and adjustment disorder. Women who did not have children after infertility treatment did not differ from non-treated control women on any diagnosis except psychotic disorder. Women who did not have children had significantly fewer hospitalizations for psychotic disorders than controls (OR 0.38, 95% CI 0.19–0.77).

Conclusion and considerations

The evidence about the association between not having children after treatment and anxiety and depression is inconsistent, with one study showing a positive association and another a negative one. The evidence suggests that the inability to disengage from the goal of biological parenthood is associated with poorer emotional adjustment.

Overall, there is little knowledge about predictors of emotional needs after unsuccessful treatment and no validated tools to detect these needs.

Recommendations

Fertility staff should be aware that women who remain childless 10 years after unsuccessful IVF/ICSI treatment are not more likely to develop psychiatric disorders than women of the same age who never underwent fertility treatment (Yli-Kuha, et al., 2010).	C
Fertility staff should be aware that women with a persistent desire for pregnancy 3 to 5 years after unsuccessful treatment may experience more anxiety and depression than women who find new life goals or women who become mothers (Verhaak, et al., 2007b).	C

4.2.A.d Cognitive needs

There is no available evidence about the predictors and methods to detect the cognitive needs experienced by patients after unsuccessful fertility treatment.

Conclusion and considerations

To our knowledge there are no studies investigating predictors and methods to detect the cognitive needs experienced by patients after unsuccessful fertility treatment. Therefore, no recommendations can be made.

Recommendations

None.

Research recommendations

Future research investigating predictors or the needs of patients after unsuccessful fertility treatment should be prospective, with a baseline established before the start of treatment or immediately after the last treatment cycle. The use of a prospective design is the only way to identify risk factors for poor adjustment after treatment, including the outcome of treatment. Psychological theoretical frameworks should be used to investigate health (e.g., treatment outcome), developmental (e.g., previous psychological vulnerability), and motivational (e.g., importance of parenthood goal) predictors of patients' short- and long-term psychosocial needs. This research base is necessary for the development of tools or other methods that fertility staff can use to identify patients who may benefit from support and to implement preventive interventions during or immediately after the end of treatment.

4.2.B PREGNANCY AFTER TREATMENT

4.2.B.a Behavioural needs

Clinical evidence

There is no available evidence about the predictors and methods to detect the behavioural needs experienced by patients who achieve pregnancy with fertility treatment.

Conclusion and considerations

To our knowledge, there are no studies assessing predictors of the behavioural needs of patients during pregnancy after fertility treatment nor are there validation studies of methods fertility staff can use to detect these needs. Therefore, no evidence-based recommendations can be made.

Recommendations

None.

4.2.B.b Relational and social needs

Clinical evidence

There is no available evidence about the predictors and methods to detect the relational and social needs experienced by patients who achieve pregnancy with fertility treatment.

Conclusion and considerations

To our knowledge, there are no studies assessing predictors of the relational and social needs of patients during pregnancy after fertility treatment nor are there validation studies of methods fertility staff can use to detect these needs. Therefore, no evidence-based recommendations can be made.

Recommendations

None.

4.2.B.c Emotional needs

The available evidence about the predictors and methods to detect the emotional needs experienced by patients who achieve pregnancy with fertility treatment refers to anxiety and mental health.

Clinical evidence

Anxiety

Hammarberg and colleagues performed a systematic review focusing on the psychological and social aspects of pregnancy, childbirth, and the first year after conception with ART (Hammarberg, *et al.*, 2008). Studies were included if they had investigated perinatal psychological or social functioning after ART treatment (i.e., excluding IUI and OI). The review

included 16 papers, which assessed either self-reported symptoms of anxiety or depression. One study reported that women who had experienced prolonged treatment failure were more anxious than those who had conceived after one ART treatment cycle. Another study found that women who had experienced high infertility-related distress were more anxious about pregnancy loss.

Mental health

Vilksa and colleagues assessed parents of 91 pairs of twins and of 367 singletons conceived with ART, as well as a control group of parents of 20 pairs of twins and of 379 singletons conceived spontaneously, at 18–20 weeks of gestation (Vilksa, *et al.*, 2009). Women’s mental health was assessed with the General Health Questionnaire (GHQ-36) which can be used to identify minor psychiatric disorders in the general population. The GHQ-36 is composed of four subscales: anxiety, depression, sleeping difficulties, and social dysfunction. No differences were found concerning anxiety, sleeping difficulties, and social dysfunction between the ART parents of twins and singletons. ART mothers of twins showed fewer symptoms of depression than control mothers of twins. All fathers had similar levels of depression.

Conclusion and considerations

There is a lack of studies of risk factors for emotional problems in couples during pregnancy achieved with fertility treatment and there are no studies on validated tools that fertility staff can use to detect these. However, there is some evidence suggesting that women who have experienced repeated treatment failure and high distress during fertility treatment might experience more anxiety during pregnancy. One study found that parents of twins do not seem to experience more emotional problems during pregnancy than parents of singletons.

Recommendations

<p>Fertility staff should be aware that women who experienced multiple failed ART cycles or high stress during treatment may be more likely to experience symptoms of anxiety during pregnancy (Hammarberg, <i>et al.</i>, 2008).</p>	<p>C</p>
<p>Fertility staff should be aware that patients with multiple pregnancies after ART are not more likely to experience poorer mental health than patients with a single ART pregnancy (Vilksa, <i>et al.</i>, 2009).</p>	<p>C</p>

4.2.B.d Cognitive needs

There is no available evidence about the predictors and methods to detect the cognitive needs experienced by patients who achieve pregnancy with fertility treatment.

Conclusion and considerations

To our knowledge, there are no studies assessing predictors of the cognitive needs of patients during pregnancy after fertility treatment nor are there validation studies of methods fertility staff can use to detect these needs. Therefore, no recommendations can be made.

Recommendations

None.

Research recommendations

There is a significant lack of knowledge about the predictors of the psychosocial needs patients experience during pregnancy achieved with fertility treatment. This gap in knowledge is partially explained by the fact that most of the previously conducted research focused on investigating predictors of adjustment during the transition to parenthood, and not specifically on the pregnancy period (which was many times used only as a baseline). However, the evidence reviewed suggests that the relational and emotional needs patients experience during pregnancy do not differ according to method of conception. If this is confirmed, specific studies focusing on patients who used fertility treatment to conceive may not be needed. If specific needs are identified, then prospective research needs to be implemented to investigate its predictors and develop methods to identify them. Ideally, such studies should be prospective, with a baseline established before the start of treatment. As previously stated, psychological theoretical frameworks should be used to investigate health (e.g., treatment outcome), developmental (e.g., previous psychological vulnerability), and motivational (e.g., importance of parenthood goal) predictors of psychosocial needs.

4.3 Addressing needs after treatment

Key question

HOW CAN FERTILITY STAFF ADDRESS THE NEEDS OF PATIENTS AFTER TREATMENT?

This section provides a comprehensive description of the effects of psychosocial interventions, that can be delivered by all fertility staff, on the patients' behavioural, relational and social, emotional, and cognitive needs.

The goal is for staff to integrate interventions that have positive effects on the patients' needs after unsuccessful or successful treatment, into the daily routine care they provide at clinics. In this particular case, as in the majority of cases, both unsuccessful and successful patients will no longer be followed at clinics; such care is assumed to be either mostly of a preventive nature or based on self-administered interventions made available for patients (e.g., e-health).

4.3.A. UNSUCCESSFUL TREATMENT

Clinical evidence

No interventions were identified that address the behavioural, relational and social, emotional, and cognitive needs of patients after unsuccessful fertility treatment.

Conclusion and considerations

We could not find any evidence on interventions that fertility staff can use to assist patients after unsuccessful fertility treatment. However, evidence from the previous questions (4.1 and 4.2) suggests that individuals and/or couples that remain childless after unsuccessful treatment or still have a desire for pregnancy are at risk of behavioural, relational, and/or emotional maladjustment. Given this fact, it is important that patients have the opportunity to discuss the implications of ending unsuccessful treatment and receive support in preparing for a childless lifestyle, or consider alternative family building options. At this point, patients showing risk factors for future maladjustment should be offered the opportunity to access specialized psychosocial support services.

Recommendations

The guideline development group recommends that fertility staff refer patients who, when ending unsuccessful treatment, experience or are at risk of experiencing (in the short or the long term) clinically significant psychosocial problems, to specialized psychosocial care (infertility counselling or psychotherapy).

GPP

The guideline development group recommends that fertility staff offer additional psychosocial care to patients who, when ending unsuccessful treatment, are at risk of increased infertility-specific psychosocial distress.

GPP

<p>The guideline development group recommends that fertility staff offer patients the opportunity to discuss the implications of ending unsuccessful treatment.</p>	<p>GPP</p>
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4.3.B PREGNANCY AFTER TREATMENT

Clinical evidence

No interventions were identified that address the behavioural, relational and social, emotional, and cognitive needs of patients after successful fertility treatment.

Conclusion and considerations

We could not find any evidence on interventions that fertility staff can use to assist patients during pregnancy after fertility treatment. However, the reviewed evidence suggests that in general the needs of couples who achieve pregnancy with fertility treatment do not differ from the needs of couples who conceive spontaneously. Therefore, these couples could benefit from currently validated interventions aimed at promoting healthy transitions to parenthood (*Glade, et al., 2005*).

Specific groups of patients, however, may experience some additional needs. All patients may experience higher anxiety about the health of their foetus. In addition, patients who experienced more treatment failures and stressful treatment, and women who are pregnant with twins, seem to be at risk of relational, emotional, and/or cognitive maladjustment (*Hammarberg, et al., 2008; Vilska, et al., 2009; Baor and Soskolne, 2010*). Therefore, patients showing these risk factors should be offered the opportunity to access specialized psychosocial support services.

Recommendations

<p>The guideline development group recommends that fertility staff refer patients who experience or are at risk of experiencing clinically significant psychosocial problems after successful treatment, to specialized psychosocial care (infertility counselling or psychotherapy).</p>	<p>GPP</p>
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<p>The guideline development group recommends that fertility staff offer additional psychosocial care to patients at risk of increased infertility-specific psychosocial distress after successful treatment.</p>	<p>GPP</p>
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<p>The guideline development group recommends that fertility staff offer patients the opportunity to discuss their worries about pregnancy achieved with fertility treatment.</p>	<p>GPP</p>
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Research recommendations

There is no research addressing how behavioural, relational/social, emotional, and cognitive needs of patients after treatment should be addressed by fertility staff; therefore this gap should be addressed in future research. As mentioned in the previous sections (2.3 and 3.3), it is crucial that future research directed at the validation of these psychosocial interventions use randomized controlled trials and evaluate feasibility and patient acceptance in addition to effectiveness.

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APPENDICES 1–7

APPENDIX 1: GLOSSARY

Adjustment: Adaptation, especially behavioural adaptation to a particular environment or set of circumstances ([Colman, 2009](#)).

Affect: Emotional or feeling states, including specific emotions such as anxiety and depression ([Fink, 2000](#)).

Anxiety: Anxiety is an emotion described by a subjective feeling of tension, apprehension, nervousness, and worry, and by activation or arousal by the autonomic nervous system. Anxiety may occur as a transitory state (i.e., state anxiety) or as a more stable disposition of anxiety-proneness (i.e., trait anxiety). Individuals high on trait anxiety are considered more prone to react to their environment with state anxiety ([Spielberger, et al., 1970](#)).

Assisted reproductive technology (ART): All treatments or procedures that include the *in vitro* handling of both human oocytes and sperm or of embryos for the purpose of establishing a pregnancy. This includes, but is not limited to, *in vitro* fertilization and embryo transfer, gamete intrafallopian transfer, zygote intrafallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation, and gestational surrogacy. ART does not include assisted insemination (artificial insemination) using sperm from either a woman's partner or a sperm donor ([Zegers-Hochschild, et al., 2009](#)).

BREC (in this document): Behavioural, relational and social, emotional, and cognitive needs of patients. 'Needs' refer to conditions, assumed necessary for patients to have a psychosocially healthy experience of the fertility treatment.

Chaperone: One who escorts; guide, conductor ([Oxford English Dictionary, 2014](#)).

Complex interventions: Complex interventions are usually described as interventions that contain several interacting components. In the context of this guideline, complex interventions are interventions that combine general information provision, continuity of care, opportunity to ask questions, being chaperoned, counselling about depression, and/or teaching patients coping or relaxation strategies ([Craig, et al., 2008](#)).

Controlled ovarian stimulation (COS): For ART: pharmacological treatment in which women are stimulated to induce the development of multiple ovarian follicles to obtain multiple oocytes at follicular aspiration ([Zegers-Hochschild, et al., 2009](#)).

Coping: Cognitive or behavioural efforts used to manage and control stress in situations where a stressor exceeds a couple's perceived or actual resources ([Lazarus and Folkman, 1984](#)).

Counselling: The practice or profession of applying psychological theories and communication skills to clients' personal problems, concerns, or aspirations. Some forms of counselling also include advice giving, but the dominant ethos is one of providing facilitation without directive guidance ([Colman, 2009](#)).

Counsellor: One who counsels or advises; an adviser ([Oxford English Dictionary, 2014](#)).

Dependency: Dependency is characterized by preoccupation with interpersonal relationships and concerns about obtaining reassurance and love, at the expense of developing a clear and stable self-concept ([Blatt, 2004](#); [Lowyck, et al., 2009](#)).

Depression: A mood state of sadness, gloom, and pessimistic ideation, with a loss of interest or pleasure in normally enjoyable activities, accompanied in severe cases by anorexia and consequent weight loss, insomnia or hypersomnia, asthenia, feelings of worthlessness or guilt, diminished ability to think or concentrate, or recurrent thoughts of death or suicide ([Colman, 2009](#)).

Embryo transfer (ET): The procedure in which one or more embryos are placed in the uterus or fallopian tube ([Zegers-Hochschild, et al., 2009](#)).

Fertility clinic staff (in this document): Doctors, nurses, midwives, counsellors, social workers, psychologists, embryologists, and administrative personnel that have contact with patients, can deliver routine psychosocial care, and/or make referrals to specialized mental health services.

In vitro fertilization (IVF): An ART procedure that involves extracorporal fertilization ([Zegers-Hochschild, et al., 2009](#)).

Infertility (clinical definition): A disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse ([Zegers-Hochschild, et al., 2009](#)).

Infertility counselling: Counselling is an interpersonal process, based on a theoretical framework, used to explore, understand, and resolve issues arising from infertility and infertility treatment and to clarify ways of dealing with the problem more effectively ([Strauss and Boivin, 2002](#)).

Intracytoplasmic sperm injection (ICSI): A procedure in which a single spermatozoon is injected into the oocyte cytoplasm ([Zegers-Hochschild, et al., 2009](#)).

Intrauterine insemination (IUI): Injection of semen into the vagina or uterus (of an animal or a person) by non-natural means; also artificial insemination ([Oxford English Dictionary, 2014](#)).

Lifestyle behaviours (in this document): Behaviours that are not optimal for fertility or conception, i.e., smoking, excessive exercise, diet that results in unhealthy BMI, the use of anabolic steroids, sexual behaviour, not optimizing probability for conception.

Maladjustment: Failure to deal adequately with problems of adaptation to physical, emotional, social, economic, or occupational circumstances, events, or experiences, generally leading to coping difficulties or symptoms of stress ([Colman, 2009](#)).

Medically assisted reproduction (MAR): Reproduction brought about through ovulation induction, controlled ovarian stimulation, ovulation triggering, ART procedures, and intrauterine, intracervical, and intravaginal insemination with semen of husband/partner or donor ([Zegers-Hochschild, et al., 2009](#)).

Mental health: A state of well-being in which every individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community ([Herrman, et al., 2005](#)).

Mental health professional: Psychiatrists, psychologists, advanced practice psychiatric nurses, social workers, licensed professional counsellors, and marriage and family therapists. These professional groups are educated at the masters or doctoral level and licensed in most states to diagnose and treat mental disorders ([Thomas, et al., 2009](#)).

Natural cycle IVF: An IVF procedure in which one or more oocytes are collected from the ovaries during a spontaneous menstrual cycle without any drug use ([Zegers-Hochschild, et al., 2009](#)).

Neuroticism: A personality trait associated with a predisposition to experience negative affect ([Fink, 2000](#)).

Ovulation induction (OI): Pharmacological treatment of women with anovulation or oligo-ovulation, with the intention of inducing normal ovulatory cycles ([Zegers-Hochschild, et al., 2009](#)).

Patient-centred care: Personalized care that focuses on the patient's experience of illness and health care. The Picker Institute introduced one of the most complete models of patient-centred care ([Gerteis, et al., 1993](#)) in which they divide patient-centred care into eight components: respect for patients' preferences; co-ordination of care; physical comfort; emotional support; transition and continuity; involvement of family and friends; access to care; and information, communication, and education ([van Empel, et al., 2008](#)).

Preference: The action of or an act of preferring or being preferred; a greater liking for one alternative over another or others; predilection ([Oxford English Dictionary, 2014](#)).

Preimplantation genetic diagnosis (PGD): Analysis of polar bodies, blastomeres, or trophectoderm from oocytes, zygotes, or embryos for the detection of specific genetic, structural, and/or chromosomal alterations ([Zegers-Hochschild, et al., 2009](#)).

Psychosocial care: Psychological and social services and interventions that enable patients, their families, and their healthcare providers to optimize biomedical health care and manage the psychological and social aspects of illness and its consequences ([Institute of Medicine \(Committee on Quality of Health Care in America\), 2001](#)).

Psychotherapy: The treatment of mental disorders and allied problems by psychological methods (Colman, 2009)

Quality of life: Individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization, 1995).

Reproductive surgery: Surgical procedures performed to diagnose, conserve, correct, and/or improve reproductive function (Zegers-Hochschild, *et al.*, 2009).

Satisfaction: The satisfying of a need or desire as it affects or motivates behaviour (Oxford English Dictionary, 2014).

Self-criticism: Self-criticism involves excessive self-evaluative concerns combined with a strong emphasis on high personal standards at the expense of interpersonal relationships (Blatt, 2004; Lowyck, *et al.*, 2009).

Self-efficacy: Ability to achieve desired results. Perceived self-efficacy includes beliefs about one's ability or competence to bring about intended results (Colman, 2009).

Self-esteem: One's attitude toward oneself or one's opinion or evaluation of oneself, which may be positive, neutral, or negative (Colman, 2009).

Stress: Psychological stress is the relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being (Lazarus and Folkman, 1984)

Well-being : The state of being or doing well in life; happy, healthy, or prosperous condition; moral or physical welfare (of a person or community) (Oxford English Dictionary, 2014).

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APPENDIX 2: TOOLS TO DETECT THE NEEDS OF PATIENTS

This section compiles a list of available tools that all fertility staff can use to assess the needs of patients before, during, and after fertility treatment. These tools were either developed specifically for assessing patients facing infertility (i.e., fertility-specific) or are generic tools that are applicable to infertile patients. Although not necessary, fertility staff may consider asking mental health professionals for support in the interpretation of the data obtained by using the tools.

Tool	Fertility-specific	Need(s) assessed					Reference/link
		Behavioural	Relational and social	Emotional	Cognitive	Other	
Beck Depression Inventory (BDI)	No			✓			(Beck and Beamesderfer, 1976)
Concerns of Women Undergoing Assisted Reproductive Technologies (CART)	Yes				✓		(Klonoff-Cohen, et al., 2007)
Cardiff Fertility Knowledge Scale (CFKS)	Yes				✓		(Bunting, et al., 2013) www.fertilityknowledge.com
Fertility Quality of life (FertiQoL)	Yes	✓	✓	✓		Quality of treatment	(Boivin, et al., 2011) www.fertiqol.com
Fertility Status Awareness Scale (FertiSTAT)	Yes	✓					(Bunting and Boivin, 2010) www.fertistat.com
General Health Questionnaire (GHQ)	No			✓			(Goldberg, 1978)
Hospital Anxiety and Depression Scale (HADS)	No			✓			(Zigmond and Snaith, 1983)
Mental Health Inventory-5 (MHI-5)	No			✓			(Florian and Drory, 1990)
Patient-centred care questionnaire (PCQ)	Yes					Experiences of patient-centredness	(van Empel, et al., 2010)
Quality of care from patient perspective – specific to IVF treatment (QPP-IVF)	Yes					Quality of care	(Holter, et al., 2014)
SCREENIVF	Yes		✓	✓	✓		(Verhaak, et al., 2010)
World Health Organization Quality of Life Tool (WHOQOL-BREF)	No			✓			(Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group, 1998)

✓ indicates that the tool can be used to assess this need.

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APPENDIX 3: ABBREVIATIONS

ART	Assisted reproductive technology
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
BMI	Body mass index
BREC	Behavioural, relational and social, emotional, and cognitive
BSI	Brief Symptom Inventory
CES-D	Centre for Epidemiologic Studies Depression Scale
CI	Confidence interval
COMPI	Copenhagen Multi-centre Psychosocial Infertility
DAS	Dyadic Adjustment Scale
DSM	Diagnostic and Statistical Manual of Mental Disorders
eDET	Elective double embryo transfer
eSET	Elective single embryo transfer
FPI	Fertility Problem Inventory
GDG	Guideline development group
GIFT	Gamete Intra-Fallopian Transfer
GRIS	Golombok–Rust Inventory of Sexual Satisfaction
HADS	Hospital Anxiety and Depression Scale
ICSI	Intracytoplasmic sperm injection
IUI	Intrauterine insemination
IVF	In vitro fertilization
MAR	Medically assisted reproduction
MHP	Mental health professionals
MMQ	Maudsley Marital Questionnaire
ns	Non-significant
OI	Ovulation induction
OR	Odds ratio
OS	Ovarian stimulation
PCC	Patient-centred care
PDQ-R	Personality Disorders Questionnaire
PGD	Preimplantation Genetic Diagnosis
POMS	Profile of Mood States
PRCI	Positive Reappraisal Coping Intervention
PSS	Perceived Stress Scale
QoL	Quality of life
RCT	Randomized controlled trial
SCL-90	Symptom Checklist
SD	Standard deviation
SE	Standard error
STAI	Spielberger State in Trait Anxiety Inventory

APPENDIX 4: GUIDELINE GROUP

This guideline was developed by a guideline development group (GDG) set up by the ESHRE Special Interest Group Psychology and Counselling. The GDG was constituted by psychologists, two medical doctors, a midwife, a patient representative, and a methodological expert.

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Declarations of interest

All members of the guideline development group were asked to declare possible conflicts of interest by means of the disclosure forms (see *ESHRE Manual for Guideline Development*).

Name	Conflict of interest
Sofia Gameiro	None declared.
Jacky Boivin	Research grants from Merck and Co.; consulting fees from Merck Serono S.A.; speaker's fees from Merck Serono S.A.
Eline Dancet	None declared.
Cora de Klerk	None declared.
Marysa Emery	None declared.
Petra Thorn	Consulting fees from German government; other conflict of interest: Chair of the German Society for Fertility Counselling.
Uschi Van den Broeck	None declared.
Christos Venetis	Consulting fees from Merck Serono S.A.
Chris Verhaak	Other conflicts of interest: advises in projects for Merck Serono and Ferring on patient educational material. Speaker's fees from Repromed, DGPM, Breitbart, DAAG, Fiore, LPTW. MSD salary/ position funding at TAB-beim-Bundestag, BZgA; other conflicts of interest: Vice-chair of the German Society for Fertility Counselling.
Tewes Wischmann	
Clare Lewis-Jones	None declared.
Nathalie Vermeulen	None declared.

To further minimize potential conflicts of interest, the synthesis of the evidence was performed by the one expert GDG member and checked by a second GDG member, the chair of the guideline group, and the methodology expert (with no conflicts of interest). Conflicts of interest were further limited by the discussion of the evidence and draft recommendations in the GDG, until consensus of the GDG was reached.

APPENDIX 5: RESEARCH RECOMMENDATIONS

For the benefit of patients attending fertility units, the GDG recommends that researchers perform high quality research to address the following key issues in the provision of routine psychosocial care:

- **Patient preferences about psychosocial care:** using high-grade evidence methods (e.g., discrete choice experiments) to assess preferences and greater precision regarding the aspect or component evaluated. For instance, it is already known that patients value information, but less is known about what type of information, when it is more useful, in what format, etc. In other words, research should progress from more general questions to more specific ones.
- **Impact of staff and clinic characteristics and psychosocial care components on patient well-being:** using RCT designs, validated instruments to assess well-being outcomes and, as for the former point, reaching greater precision about staff and clinic characteristics and care components. At this stage, it is preferable to assess single care components rather than complex interventions that integrate multiple different components. Once the field has enough knowledge about the psychosocial care components that are efficacious, complex interventions can be developed to investigate their additive effect. If this process is followed, then it should enable the development of complex interventions with proven efficacy (Campbell, *et al.*, 2000). Attention should also be paid to how patient characteristics (e.g., level of distress experienced, gender) moderate the impact of staff and clinic characteristics on their well-being.
- **What are the needs of patients before, during, and after fertility treatment:** considering specific treatment stages (e.g., oocyte retrieval) and inclusive groups of patients. Because the demands of treatment vary considerably across treatment, data from studies with patients undergoing different treatment stages are difficult to interpret. Research should also strive to be inclusive, by not excluding patients due to issues such as ethnicity, sexual orientation, country of origin, etc.
- **Development and validation of psychosocial interventions that can be delivered by staff or self-administered by patients:** based on sound theoretical frameworks and using RCT designs and validated instruments to assess the specific needs addressed at specific treatment stages. The design of such interventions should try to address barriers to adoption and implementation by all staff members. The following needs should be addressed:
 - Provision of information before the start of treatment (including format, content, and communication agent or channel)
 - Supporting patients after unsuccessful treatment, including promoting personal acceptance of unmet parenthood goals. Given the fact that, at this stage, patients will not have regular contact with health providers, self-administered interventions (e.g., e-health) seem preferable
 - Communication and discussion of treatment-related options and concerns
 - Decision support about uptake or not of recommended fertility treatment
 - Reduction of the physical and practical burden of treatment procedures
 - Anxiety management during the 2-week waiting period
 - Delivery of bad-news (about negative response to treatment or outcome)
 - Supporting patients who receive the notice that treatment was unsuccessful
 - Promotion of social support networks.

Other important topics for further research:

- Evaluation of feasibility and acceptability of psychosocial interventions that can be delivered by staff or self-administered by patients
- What are the needs of patients before, during, and after first-line treatments?
- What are the specific needs of men undergoing fertility treatment?
- How do ethnic, religious, societal, and cultural factors shape the needs of patients?
- How can we identify patients at risk of non-compliance with recommended treatment?
- How can we identify patients at risk of maladjustment after unsuccessful treatment?

APPENDIX 6: METHODOLOGY

Guideline development

European Society of Human Reproduction and Embryology (ESHRE) guidelines are developed based on the *Manual for ESHRE Guideline Development* (Nelen, 2009), which can be consulted at the ESHRE website (www.eshre.eu). The principal aim of this manual is to provide stepwise advice on ESHRE guideline development for members of ESHRE guideline development groups (GDGs). Additionally, the expectation is that this approach will improve the methodological quality of ESHRE guidelines and will have a positive impact on the quality of European reproductive healthcare delivery. The manual has been developed by the Special Interest Group Safety and Quality in ART and has been approved by the Executive Committee. This manual describes a 12-step procedure for writing clinical management guidelines by the guideline development group, supported by the ESHRE methodological expert:

1. Guideline topic selection
2. Formation of the guideline development group
3. Scoping of the guideline
4. Formulation of the key questions
5. Search of evidence
6. Synthesis of evidence
7. Formulation of recommendations
8. Writing the guideline's draft version
9. Consultation and review
10. Guideline dissemination
11. Guideline implementation and evaluation
12. Guideline updating.

The current guideline was developed and funded by ESHRE, which covered expenses associated with the guideline meetings (travel, hotel, and catering expenses), literature searches (library costs, costs associated with the retrieval of papers), and the implementation of the guideline (printing, online web tool, publication costs). Except for reimbursement of their travel expenses, GDG members did not receive any payment for their participation in the guideline development process.

The coordinators of the Special Interest Group (SIG) Psychology and Counselling in 2010 took the initiative to write guidelines on psychosocial care in infertility and medically assisted reproduction. A first meeting with the coordinators, past coordinators, and deputies of the SIG Psychology and Counselling was organized to determine the topic of the guideline and complete the scoping checklist. The initial group of seven psychologists and one medical doctor was extended after this initial meeting with a patient representative (Ms Clare Lewis-Jones from Infertility Network UK), another medical doctor (Dr Christos Venetis, a gynaecologist with an interest in patient-centred infertility care), and Dr Eline Dancet (a midwife with a specific interest and expertise on patient-centred infertility care). We strived for balances in gender and location within Europe, taking into account the female dominance in the field of psychology and counselling, and the dominance of West-European countries regarding expertise and interest in guideline development.

Six guideline group meetings were organized at different key points in the guideline development process, with either training in evidence-based medicine and guideline development, or discussion on decisions to be made.

At the second guideline group meeting, 12 key questions (in PICO format) were shaped until consensus was reached and the key words were defined. Each GDG member was assigned one or more PICO question.

Systematic literature searches

Based on the key words, the methodology expert searched for evidence in PUBMED, the Cochrane library, PsychInfo, and Embase. The literature searches included studies published between 1 January 1990 and 1 April 2014 (or indexed in PUBMED/PsychInfo before 1 April 2014). Additionally, an email was sent to the members of the ESHRE SIG Psychology and Counselling requesting suggestions for publications that would be relevant for the guideline. Papers, dissertations, and book chapters were included, but conference abstracts were excluded. Literature searches were not limited to the English language. However, none of the non-English papers considered for inclusion and assessed in the evidence tables was retained in the final summary of evidence.

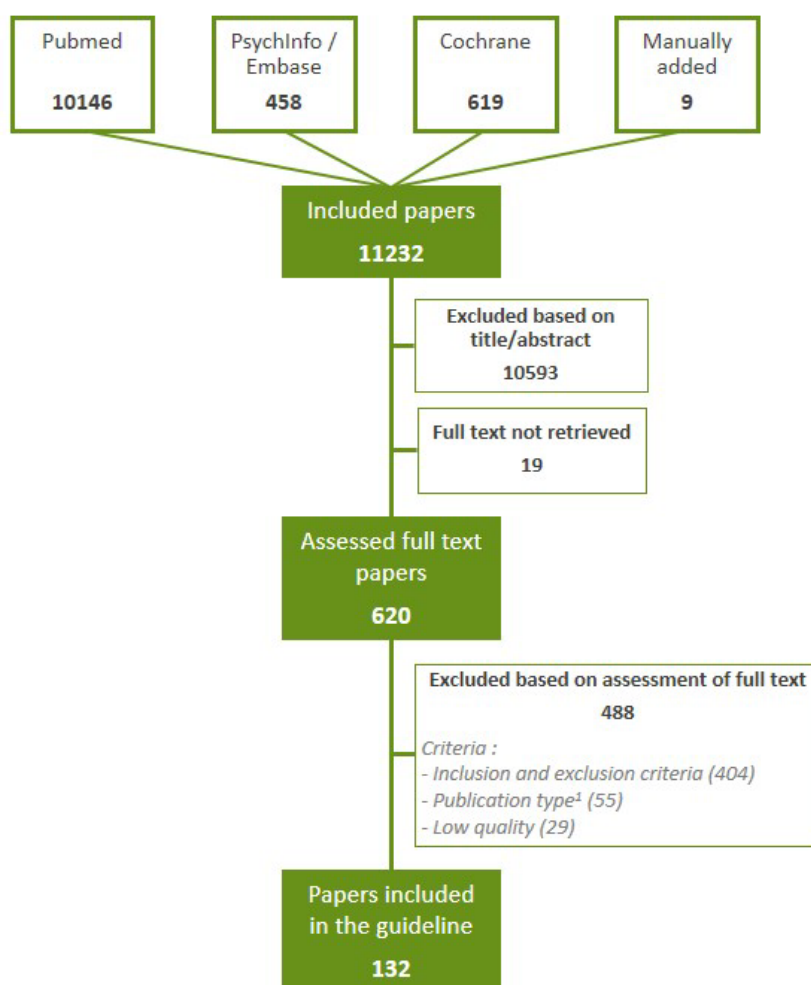
Literature searches were performed as an iterative process. In a first step, systematic reviews and meta-analyses were collected. If no results were found, the search was extended to randomized controlled trials, and further to prospective studies and case reports. Preliminary searches were pre-sifted by the methodology expert, based on title and abstract. The assigned GDG member then continued sifting the literature search results based on title, abstract, and his/her knowledge of the existing literature, to see if the manuscript met all inclusion criteria. If necessary, additional searches were performed in order to get the final list of papers. The process of study selection, from retrieval via systematic search until final inclusion, is summarized in a flowchart (Figure A6.1).

Inclusion and exclusion criteria

Studies were included if they provided evidence that described the needs of the standard infertile patient before, during, and after fertility treatment, or provided evidence on how to detect or address these needs.

We considered behavioural, relational and social, emotional, and cognitive needs (BREC needs). The outcomes included for behavioural needs were lifestyle behaviour, exercise, nutrition, and compliance with treatment. For relational and social needs, the outcomes were relationship with spouse/partner, family, friends and larger network, and work. For emotional needs, the outcomes were anxiety, depression, quality of life, stress/distress, psychiatric disorders and morbidity, positive and negative affect, mood, optimism, grief, and self-esteem. Finally, for cognitive needs the outcomes were knowledge and concerns. Only data from studies where these outcomes were assessed with validated reliable questionnaires were included.

Figure A6.1. Process of selection of evidence from literature search results to final list of papers included in the guideline



¹Exclusion of papers based on publication type when higher quality studies (i.e., systematic reviews) were included, and exclusion of opinion papers and narrative reviews.

Data on needs description included all studies with descriptive data on a sample of infertile patients, or studies that compared groups of infertile patients with a control group (definitions of control groups were highly heterogeneous) or population norms. Data on needs detection were all data from studies that assessed risk factors (correlations in cross-sectional studies or predictors in longitudinal studies) for the BREC needs. Data on addressing needs were all data from studies that described the effect of psychosocial care components or interventions that can be delivered without the presence of an MHP and specialized training, on the patients' BREC needs.

Within this framework, studies were only included if their assessment moments corresponded to any of the three treatment stages considered (Figure A6.2):

- **Before treatment:** from the first visit to the clinic to the start of the first treatment cycle. We defined the start of the cycle until the 5th day of ovarian stimulation, because many studies

define their baseline assessment moment during stimulation. Therefore, the before-treatment period includes the first appointment at the clinic, the diagnostic process, and the waiting period before starting treatment.

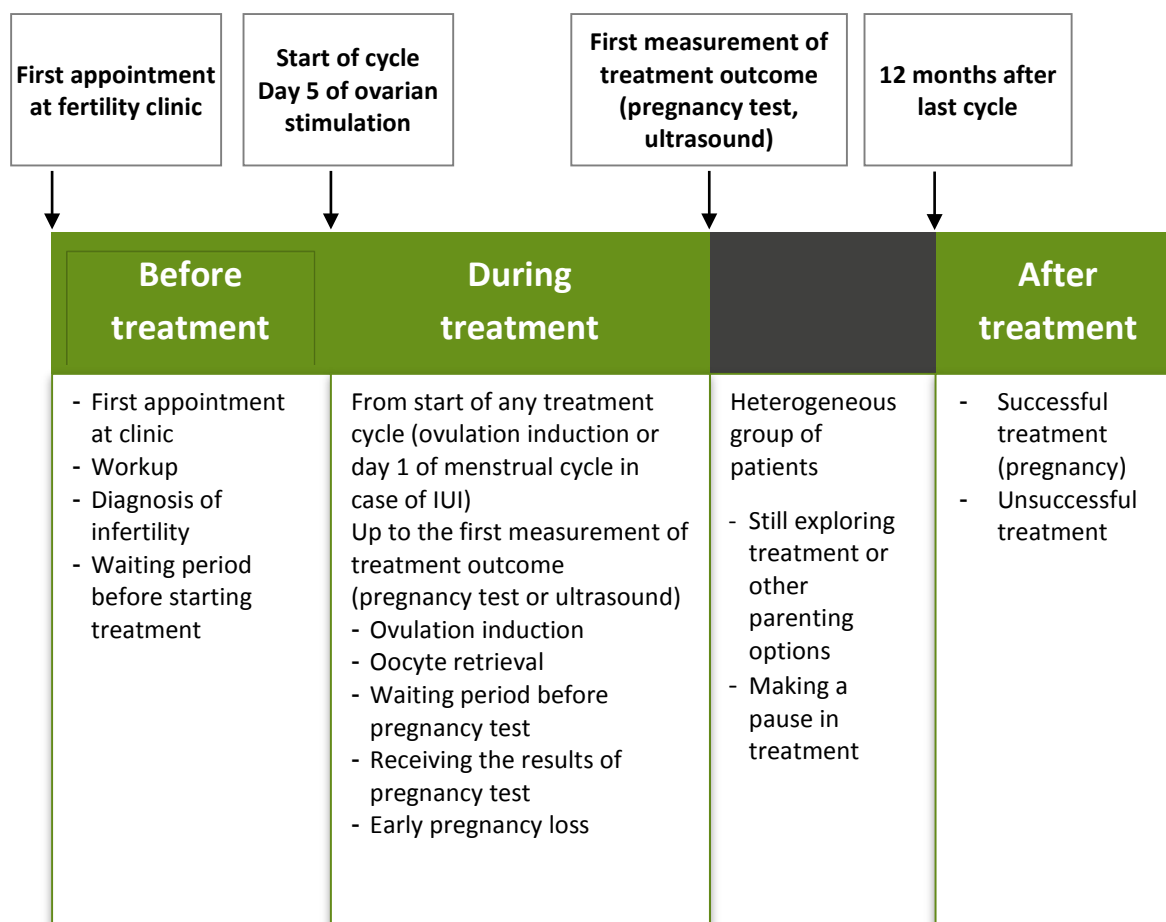
- During treatment: time that encompasses any treatment cycle, be it either first-line treatment such as IUI, or ART cycles (IVF and/or ICSI). One first-line treatment cycle begins at the start of the woman's menstrual cycle. One ART treatment cycle begins at the start of ovulation induction. The treatment cycle can therefore include (according to the treatment performed) ovarian stimulation, oocyte retrieval, embryo transfer, the waiting period until and the first measurement of treatment outcome (e.g., pregnancy test 15 days after the embryo transfer, first ultrasound scan 6 weeks after the embryo transfer), including reactions to the treatment outcome. Many studies examining the treatment period do a baseline assessment before the actual start of the cycle (varying from a few days to 1 month) and usually measure reactions to the treatment outcome approximately 1 month after the pregnancy test, in order to avoid capturing extreme grief reactions. These studies were included in the during-treatment period when they had a longitudinal design that partially or totally overlapped with it.
- After treatment: period starting 1 year after patients undergo their last treatment cycle. The existing literature on the after-treatment period differentiates between people who did not conceive with treatment (i.e., unsuccessful treatment, e.g., negative pregnancy test, miscarriage, etc.) and people who did (i.e., successful treatment that results in pregnancy) and this distinction is retained in the Guidelines. In the case of unsuccessful treatment, the after-treatment period extends indefinitely into the future. Therefore, the wording 'short-term' will be used to refer to the period from 1 to 2 years after treatment, and 'long-term' to refer to the period that starts 2 years after treatment. In the case of pregnancy achieved via treatment, the after-treatment period refers only to the pregnancy period and ends with the birth of the child.

To be included in the guidelines, studies had to be of moderate to high quality, allowing for recommendations from level A to D (see Quality assessment section below). Finally, studies with specific patient populations (e.g., patients using third-party reproduction, lesbian couples) were only included if the needs or psychosocial care described were common to all infertile patients.

Data extraction

The evidence was collected by the assigned GDG member and summarized in evidence tables, according to the GIN format (<http://www.g-i-n.net/activities/etwg>). These tables were then checked by another GDG member and disagreement was resolved by discussion between the two GDG members until consensus was reached.

Figure A6.2. Definition of before, during, and after fertility treatment periods as used in this guideline



Quality assessment and grade of recommendations

All included studies were assessed to determine the quality of evidence. The quality of the selected papers was assessed using the quality assessment checklist defined in the ESHRE guideline manual. The quality assessment tables were constructed by one GDG member and checked by a second GDG member. Disagreement was resolved by discussion between the two GDG members until consensus was reached.

Quantitative studies were scored from 1++ to 4, based on the study type and quality. Quality of studies was assessed with the quality assessment checklists provided in the ESHRE manual for guideline development. The scores are listed in Table A6.1.

The methodological quality of qualitative studies was assessed with a checklist (Criteria for Evaluating Qualitative Studies) developed by the Qualitative Research and Health Working Group of the Liverpool School of Tropical Medicine (LSTM). Although included initially and assessed accordingly, evidence deducted from qualitative studies was not included in the summary of evidence or as supporting evidence for the recommendations. Qualitative research has significant value to assess the lived experience of infertility and fertility treatment. However, qualitative studies are generally not hypothesis-driven and not objective/neutral, as the researcher puts him/herself in the position of the participant to understand how the world is from that person's perspective. Following general

consensus, writing recommendations based on qualitative research only should be avoided (Biggerstaff and Thompson, 2008).

The combined evidence to answer each specific PICO question was scored from A to D, based on the included (quantitative) studies and their quality. Recommendations were formulated to reflect the strength of the evidence. It is important to note that the grade of a recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation. This information is summarized in Table A6.1.

Table A6.1. Constitution of the grade of recommendations based on the supporting evidence (study type and quality). Adapted from the Scottish Intercollegiate Guidelines Network (SIGN)

Study type	Level of evidence	Study quality	Grade of recommendation
Meta-analysis	1	High (++)	A
Multiple randomized trials		Moderate (+)	B
Single randomized trial	2	High (++)	B
Large non-randomized trial(s)		Moderate (+)	C
Case control / cohort studies			
Non-analytical studies Case reports / case series	3	High (++) / moderate (+)	D
Experts' opinions	4	/	GPP
All studies	-	Low (-)	Excluded from the guideline

Formulation of recommendations

Based on the collected evidence, draft recommendations were written for each question by the assigned GDG member. Two 2-day guideline group meetings were organized to discuss the draft recommendations and the supporting evidence, and to reach consensus on the final formulation of the recommendations. After the final guideline group meeting, the chair of the guideline group and the methodology expert revised all the evidence and the recommendations and combined them into one coherent and consistent document. Finally, all GDG members and the patient representative reviewed the document and formulated written comments, which were incorporated before the draft guideline was published on the ESHRE website for review by stakeholders.

Strategy for review of the guideline draft

After finalization of the guideline draft, the review process was started.

The draft guideline was presented at the 2014 ESHRE Annual Meeting in Munich and published on the ESHRE website, accompanied by the reviewers' comments form and a short explanation of the review process. The guideline was open for review between 5 August 2014 and 30 September 2014.

To notify interested psychologists, we sent out by email an invitation to review the guideline to all members of the ESHRE SIG Psychology and Counselling, and published an invitation for review in the ESHRE e-newsletter (ESHRE update August 2014).

Selected reviewers were invited personally by email. These reviewers included:

- Coordinators and deputies of the ESHRE SIG Psychology and Counselling, and Quality and Safety in ART
- Members of Fertility Europe (contact persons of patient organizations across Europe)
- European societies in psychology and counselling
- National, European, and non-European societies in the field of infertility and reproductive medicine.

All reviewers are listed in Appendix 7. The reviewer comments processing report, including further information on the review and a list of all comments per reviewer with the response formulated by the GDG, will be published on the ESHRE website.

Guideline implementation strategy

The standard dissemination procedure for all ESHRE guidelines comprises publishing (three steps) and announcement (six steps).

Each guideline is published on the ESHRE website and in *Human Reproduction*. The announcement procedure includes an announcement in *Focus on Reproduction*, a newsflash on the ESHRE website homepage, and a news item in the monthly digital ESHRE newsletter. All participants in the annual ESHRE meeting will be informed about the development and release of new guidelines during a specific guideline session; all related national societies and patient organizations are separately informed about the guideline release. They are asked to encourage local implementation by, for instance, translations or condensed versions, but they are also offered a website link to the original document. Finally, all appropriate remaining stakeholders will be informed.

A patients' version of the guideline will be developed by a subgroup of the GDG together with patient representatives. This is a translation of the recommendations into everyday language, with emphasis on questions important to patients. It aims to help patients understand the recommendations of the guideline and facilitates clinical decision-making.

To further enhance implementation of the guideline, the members of the GDG will in collaboration with the methodological expert work on option grids, flowcharts, and/or addition of graphic/visual material to the guideline to aid clinicians to incorporate the most important recommendations in daily practice. All supporting material will be available for clinicians on the ESHRE website.

Schedule for updating the guideline

Guidelines should be kept up to date. They should be considered for revision 4 years after publication. Two years after publication, a search for new evidence will be performed by the methodology expert. In the case of important new findings, the methodology expert will contact the chair of the GDG and decide the necessity of an updated version of the guideline.

Every care is taken to ensure that this publication is correct in every detail at the time of publication. However, in the event of errors or omissions, corrections will be published in the web version of this document, which is the definitive version at all times. This version can be found at (www.eshre.eu).

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APPENDIX 7: REVIEWERS OF THE GUIDELINE DRAFT

As mentioned in the methodology, the guideline draft was open for review for 8 weeks, between 5 August 2014 and 30 September 2014. All reviewers, their comments, and the reply of the guideline development group are summarized in the review report, which is published on the ESHRE website as supporting documentation to the guideline.

The list of experts in the field that provided comments to the guideline and their nationality are summarized below.

Douglas Saunders	<i>Australia</i>	Akiko Mori	<i>Japan</i>
Cailin Jordan	<i>Australia</i>	Claudia Melo	<i>Portugal</i>
Chantalle Laruelle	<i>Belgium</i>	Mariana Moura Ramos	<i>Portugal</i>
Adelheid Rigo	<i>Belgium</i>	Diana Guerra Diaz	<i>Spain</i>
Vanya Savova	<i>Bulgaria</i>	Herborg Holter	<i>Sweden</i>
Ma Fang	<i>China</i>	Helena Volgsten	<i>Sweden</i>
Tracey Chester	<i>England</i>	Carolyn Cesta	<i>Sweden</i>
Laure Camborieux	<i>France</i>	Stina Järholm	<i>Sweden</i>
Petra Thorn	<i>Germany</i>	Tanja Tydén	<i>Sweden</i>
Anne Meier-Credner	<i>Germany</i>	Danièle Besse	<i>Switzerland</i>
Heribert Kentenich	<i>Germany</i>	Marysa Emery	<i>Switzerland</i>
Vera Higi	<i>Hungary</i>	Lies ter Haar	<i>The Netherlands</i>
Bonnie Maher	<i>Ireland</i>	Marja Visser	<i>The Netherlands</i>
Liora Baor	<i>Israel</i>	Nezihe Kizilkaya Beji	<i>Turkey</i>
Yael Benyamini	<i>Israel</i>	Tereza Indrielle	<i>UK</i>
Hana Gilaie Guinor	<i>Israel</i>	Steve Lui	<i>UK</i>
Alma Linkeviciute	<i>Italy</i>	Stamatios Karavolos	<i>UK</i>
Daniela Leone	<i>Italy</i>	Nicky Hudson	<i>UK</i>
Lalatte Faustina	<i>Italy</i>	Charmain Russell	<i>UK</i>
Zaira Donarelli	<i>Italy</i>	Patricia E. Hershberger	<i>USA</i>
Laura Salerno	<i>Italy</i>	Deborah Lancaster	<i>UK</i>

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