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PSYCHOLOGICAL ASSESSMENT IN INFERTILITY: THE DERA, A MEASURE DEVELOPED IN SPAIN

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The main goal of this paper is to introduce an innovative field in health psychology, namely that of infertility, and present the new professional opportunity represented by what we have called "Reproductive Psychology". In addition, we offer a historical view of the main variables that have been included in the assessment of couples with infertility issues and the psychological techniques that have been used for such assessment. Finally, we present the DERA, an innovative screening tool for detecting emotional maladjustment, as well as individual and interpersonal adaptive resources couples may have for coping with assisted reproduction treatments and their results. The main advantages of this tool, its characteristics and its potential additional uses are also discussed.
Keywords: *Infertility, Reproductive Psychology, assessment, emotional maladjustment, adaptive resources*

El objetivo principal de este artículo es presentar un área novedosa dentro de la psicología de la salud, como es el campo de la infertilidad. Abordamos esta nueva posibilidad profesional en lo que hemos denominado "Psicología de la Reproducción". Ofrecemos además una visión histórica de las principales variables que han sido objeto de evaluación en estas parejas con problemas de infertilidad y de las técnicas de evaluación psicológica que se han venido utilizando para valoración. Finalmente, presentamos el DERA, herramienta novedosa de screening para detectar un posible desajuste emocional, así como los recursos adaptativos, individuales e interpersonales, con los que la pareja puede contar para hacer frente al proceso de tratamiento de reproducción asistida y a los resultados. Exponemos también las ventajas principales de esta herramienta y detallamos sus características y potenciales usos adicionales.
Palabras clave: *Infertilidad, Psicología de la Reproducción, evaluación, desajuste emocional, recursos adaptativos*

INFERTILITY: CURRENT STATE

An estimated fifteen to eighteen percent of Spanish couples are infertile, and the trend is upward. It is calculated, moreover, that of this group, 60% will turn to assisted reproduction procedures to be able to conceive a child. Social, cultural and economic changes help, at least in part, to explain such figures. For example, full access to higher education for women has led to their incorporation in the labour market, with the resulting delay in the intention to have children, given the difficulties of reconciling family life with work. Another relevant factor concerns the possibility, previously scarce, of changing partners over one's life, which has meant that more women –whether or not they have previously had children– are likely to want children at a relatively advanced age with a new partner. The problem is that the probabilities of pregnancy, both naturally and via assisted reproduction techniques, decrease with age. For example, in the case of conception with assisted reproduction treatment, if the chances of success for a woman under 35 are 40%, by the time she is 40 they fall to 15%. In fact, the number of children per woman of childbearing age is one of the indicators that tends to move in the opposite direction to economic development. Thus, the highest rates are found in the most developed countries and the lowest in the least developed. In Spain, fertility rates are the lowest in the European Union.

As regards the causes of infertility, in 40%-50% of cases the cause lies with the man (lack or scarcity of spermatozoids or their low mobility, or high percentage of abnormal sperm), while in just 22.3% does it lie with the woman (reduction of ovarian stock, endometriosis or blocked tubes); 16.7% of cases have mixed causes and in another 14% the causes are unknown.

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WHICH PSYCHOLOGICAL VARIABLES ARE ASSESSED IN THE INFERTILE POPULATION?

Emotional alterations: anxiety and depression

There is considerable evidence about the psychological impact of infertility and its treatment, and that quality of life in infertile couples is lower than that of fertile couples (Ávila Espada, 1993; El Messidi, Al Fozan, Lin Tan, Farag & Tulandi, 2004; Llavona, in this issue; Moreno-Rosset, 2000; Robinson & Stewart, 1996; Rosenthal & Goldfarb, 1997). Thus, while infertility does not in itself constitute a psychopathology –as explained in the article by Antequera, Moreno-Rosset, Jenaro and Ávila in this same special issue– the process that involves coping with an infertility diagnosis, undergoing assisted reproduction treatment and repeated attempts to achieve conception constitutes a long and stressful period that puts couples at risk of developing emotional problems and difficulties of adjustment (Fassino, Pierò, Boggie, Piccioni & Garzaro, 2002; Smeenk, Verhaak, Eugster, Van Minnen, Zielhuis & Braat, 2001). Specifically, various studies have found evidence of emotional alterations, such as anxiety, especially in women (Seibel, Lobo, Motta, Kotecki, Fuentes & Serafini, 2003), though the two sexes present similar patterns with regard to the relationship between anxiety and infertility (Anderson, Sharpe, Rattray & Irvine, 2003; Peterson, Newton & Feingold, 2007).

Other emotional problems are related to depression. Recent work indicates that there are more women with depression or with history of depression in the infertile group (Iribarne, Mingote, Denia, Martín, Ruiz & De la Fuente, 2003; Meller, Burns, Crow & Grambsch, 2002). Moreover, it is clear that women with primary infertility and their partners score significantly higher in depression than couples with secondary infidelity (Epstein & Rosenberg, 2005). There is some controversy, however, insofar as recent research shows that the duration of infertility only has a moderate influence on depression, and it is not clear whether indeed these moderate levels of depression may reduce the success of assisted reproduction treatment (Brasile, Katsoff & Check, 2006). It should also be stressed that clinically significant levels of emotional maladjustment are found in only a minority of these patients (Anderson, et al., 2003).

Coping strategies

As regards the coping strategies patients use when faced with this stressful life event, several studies have found that women in assisted reproduction tend to use passive or avoidance coping strategies and to have more feelings of guilt about the infertility, and, in sum, more emotional maladjustment (Anderson, et al., 2003; Lukse & Vacc, 1999). Hence, they constitute a group at risk of having negative feelings about themselves and a sense of isolation (Pottinger, McKenzie, Fredericks, DaCosta, Wynter, Everett & Walters, 2006). However, there is no clear consensus, since other research suggests that it is men who are less liable to employ coping strategies (Kowalcek, Wihstutz, Buhrow & Diedrich, 2001); indeed, some meta-analyses indicate that women are more likely than their partners to use strategies based on seeking social support, escape-avoidance, problem-solving or positive reformulation (Jordan & Revenson, 1999).

Marital adjustment

A third aspect in which there is increasing research interest concerns the assessment of the couple's dynamic. In this regard, various studies suggest that couples in which the two members perceive similar social stress levels related to infertility score significantly higher in marital adjustment than those whose perceptions differ (Peterson, Newton & Rosen, 2003). Furthermore, couples who experience similar levels of need for paternity also show better marital adjustment than couples with differing levels of need. In turn, discrepancies in perceptions about the relationship and paternity are associated with depression in the woman. All of these findings support the theory that high levels of fit between the members of the couple in relation to the stress they experience help them to cope more effectively with the impact of stressful life events (Peterson et al., 2003). It has even been found that sharing the stress associated with infertility can improve the couple's relationship (Repokari, Punamaki, Unkila Kallio, Vilska, Poikkeus, Sinkkonen, Almqvist, Tintinen & Tulppala, 2007). From the studies reviewed there emerges the need to assess both members of the couple and to determine the congruence of their perceptions and experiences.

Social support

Mutual support of the members of the couple seems, then, to be a crucial element in the process of adaptation to and coping with infertility and assisted reproduction treatment. Closely related to this aspect is the availability of an adequate social support network, and particularly, perceived social support. As Östberg and Lennartsson (2007) point out, numerous studies in different contexts

demonstrate the relationship between social support and state of health. Likewise, the influence of social support, both direct and protective (as a buffer), on stress has repeatedly been shown (Barrón, 1996). In the field of chronic illness, the benefits of each type of support (instrumental, emotional, informative, evaluative) appear to depend on the phase of evolution of the illness through which the patient is passing. Thus, for example, instrumental support may be more beneficial for those patients with some type of functional limitation, whilst support of an emotional nature proves more effective throughout the process of adjustment and adaptation to the illness. Similarly, there is a close relationship between the effectiveness of each type of support and the agent who provides it; for example, in the area of chronic illness, informational support provided by health professionals tends to be the most effective (Berkman, Glass, Brissette & Seeman, 2000; Uchino, Cacioppo & Kiecolt-Glaser, 1996). In the specific context of infertility, it has been found that the perception of social support and the search for such support explain a significant amount of variance in the marital adjustment of couples with problems of infertility (Maillet, 2003; Peterson, 2006).

Personality characteristics

Continuing with the examination of factors related to effective coping with infertility and the processes of assisted reproduction, it is possible to consider individuals' personality characteristics, though it should be stressed that studies on infertility which deal with this aspect are scarce, to say the least. Among the relevant personal resources we can identify certain characteristics linked to the so-called "resistant personality" (Maddi & Kobassa, 1984), to optimism or to the perception of control over events. A resistant personality pattern provides the necessary motivation for coping with stressful circumstances and converting them into a possibility for growth; as such, it plays an important role as a mechanism of resilience (Seligman & Csikszentmihalyi, 2000, Bonanno, 2004; Maddi, 2006). Thus, it has a protective effect against stressful situations, since it is associated with increased social support, with the development of coping strategies based on problem-solving and with the enhancement of personal equilibrium. Furthermore, the as-yet scarce research that has analyzed the relationship between resistant personality and coping has found moderate positive correlations, even though this type of personality would appear to have a more substantial influence on positive coping with everyday stressors (increasing strategies based on problem-solving and reducing those based on denial or escape) (Maddi & Hightower, 1999).

For its part, optimism is related to constructs such as well-being, happiness and quality of life (Avia & Vázquez, 1999). It can be asserted, on the basis of research to date, that people with a stable tendency for optimism are more resistant to the consequences of stress, maintain a more favourable state of health and adapt better to illness (Scheier & Carver, 1987; Carver & cols., 1993a, 1993b). Optimism has been found, moreover, to be associated with the adoption of effective coping strategies when people are faced with life-threatening situations (Maddi & Hightower, 1999).

Finally, the sense of control involves the belief that, to a greater or lesser extent, the individual is capable of exercising some kind of dominion over his or her environment (Dobson & Pusch, 1995). In fact, lack of control can act as a stressor and have a direct and negative effect on the individual's health, whilst a sense of control can act as a protective factor against stress and increase the likelihood that the person will perform healthy behaviours, thus having a direct and positive effect on his or her state of health (Wallston, 1989).

WHY IS PSYCHOLOGICAL ASSESSMENT NECESSARY IN INFERTILITY?

From what we have seen up to now, the psychologist clearly has a relevant role to play in the assessment and treatment of couples who have to cope with a situation of infertility (Gonzalez, 2000; Kainz, 2001). Such a role is exercised within the framework of Health Psychology, in its sub-field of so-called Reproductive Psychology (Moreno-Rosset, Antequera, Jenaro & Gómez, 2008; Moreno-Rosset, Jenaro & Antequera, 2008). This term echoes others used in Medicine, in the same way as those of other health-related specialities in Psychology. The Spanish Fertility Society (*Sociedad Española de Fertilidad*, SEF) acknowledges the relevant role of the psychologist, and since 2005 has included a Psychology Interest Group, whose brief is to increase knowledge and understanding of the psychological and emotional aspects involved in reproductive health, on the part of both the specialists involved and patients.

Psychological assessment is necessary for detecting the principal problems associated with infertility and for implementing the appropriate intervention (see Ávila and

Moreno-Rosset, in this special issue), and this requires the use of techniques specially designed for these purposes. Numerous studies in this area have employed instruments for assessing anxiety, depression or coping, generally in conjunction with measures of stress, capacity for adjustment to infertility and social, sexual or relationship worries (e.g., Andrews, Abbey & Halman, 1991; Brasile, Katsoff & Check, 2006; Meller, Burns, Crow & Grambsch, 2002). Other studies have used specific instruments for the assessment of infertility (Glover, Hunter, Richards, Katz & Abel 1999; Newton, Sherrard & Glavac, 1999; Peterson, Newton & Feingold, 2007; Stanton, 1991), together with personality variables measures (e.g., McKenna, 1998; Rausch, 1998; Stanton, Lobel, Sears & DeLuca, 2002).

Concentrating on the specific instruments developed in the field under study here, they can be grouped according to their content, into those which focus on the assessment of: a) the impact of infertility on different areas of life, b) the emotional consequences, c) adaptation to the situation of infertility, d) other more specific aspects, or e) more than one psychological dimension. Table 1 shows the instruments developed up to the present.

However, it will be necessary to address numerous methodological deficiencies (Boivin, 2003; Coeffin-Driol & Giami, 2004; Greil, 1997; Liz & Strauss, 2005) in assessment studies and in the instruments developed, notable among which are: (a) the predominance of the study of psychological consequences, presumed to be negative, in women, with scant attention paid to the assessment of men; (b) the use of small and largely unrepresentative samples; (c) the excessive use of self-reports, with the consequent scarce control over associated sources of error, including social desirability; (d) the low discriminative power of the questionnaires; (e) the application of inappropriate or obsolete statistical analyses; (f) the lack of longitudinal studies that provide an overview of the process of adaptation to and coping with infertility; (g) the proliferation of studies focusing on the negative consequences of infertility, considering it as an element that necessarily harms the couple's relationship; and (h) the scarcity of research that studies and compares the emotional situation, perception of resources and use of coping strategies in each member of the infertile couple.

We should like to underline the fact, moreover, that with very few exceptions, studies in this field have placed the emphasis on infertility as a problem, and have therefore highlighted the negative psychological repercussions. This is the most traditional approach within psychological intervention in relation to chronic illness: the search for the negative consequences generated in patients by the illness. Without denying the pertinence of this perspective, we believe it leads to a reductionist view of patients. The human being is also an active agent equipped with strategies and resources for coping with difficult situations and attempting to modify them or adapt to them. As is argued from so-called Positive Psychology, progress in the study of the resources and strengths that can help people to increase their psychological well-being have been clearly less substantial. And this despite the evidence that aspects such as optimism, hope or perseverance can act as protectors and help individuals faced with highly stressful

TABLE 1
INSTRUMENTS CREATED FOR POPULATION WITH PROBLEMS OF INFERTILITY

Assessment	Instrument
Stress associated with infertility	✔ "The Fertility Problem Stress" (Andrews, Abbey & Halman, 1991) ✔ "The Infertility Specific Distress Scale" (Stanton 1991) ✔ "The Fertility Problem Inventory" (FPI; Newton, Sherrard & Glavac, 1999) ✔ "Infertility Distress Scale" (Pook, Rhorle & Krause, 1999) ✔ "Infertility Reaction Scale" (IRS; Collins, Freeman, Boxer & Tureck, 1992)
Emotional consequences	✔ "Inventario de problemas psicológicos en infertilidad" [Inventory of psychological problems in infertility] (IPPI; Llavona & Mora, 2006) ✔ "Psychological Evaluation Test of Assisted Reproduction Techniques" (PET-ART; Franco, Razera, Mauri, Petersen, Felipe & Garbellini, 2002) ✔ "The Effects of Infertility" (Anderheim, Holter, Bergh & Möllery cols, 2005)
Adaptation	✔ "The Fertility Adjustment Scale" (FAS; Glover, Hunter, Richards, Katz & Abel, 1999) ✔ "Questionnaire on the Desire for a Child" (FKW; Hölzle & Wirtz, 2001)
Specific aspects	✔ "Infertility Treatment Questionnaire" (Shiloh, Larom & Ben-Rafael, 1991) ✔ "Infertility Cognitions Questionnaire" (KINT; Pook, Tuschen-Caffier, Schnapper, Speiger, Krause & Florin, 1999) ✔ "The Measure of Infertility Control" (Miller-Campbell, Dunkel-Schetter & Peplau, 1991)
Multidimensional assessment	✔ "Cuestionario de ajuste psicológico en infertilidad" [Psychological adjustment in infertility questionnaire] (CAPI; Llavona & Mora, 2002)

situations to avoid developing psychopathological alterations or disorders.

THE DERA, AN INSTRUMENT CREATED IN SPAIN

Thus, in an effort to contribute to the development of Reproductive Psychology as an applied area of Health Psychology and, at the same time, address some of the methodological deficiencies referred to above, we have created the DERA (Questionnaire on Emotional Maladjustment and Adaptive Resources in infertility; *Cuestionario de Desajuste Emocional y Resources Adaptativos en infertilidad;* Moreno-Rosset, Antequera & Jenaro, 2008).

We use the term "emotional maladjustment" in order to highlight the goal of this instrument, which is the assessment of alterations that may occur at an emotional level, as a result of the need to cope with a stressful event, but which do not have the characteristics necessary for them to be considered psychopathological disorders. However, although such maladjustment may be considered a prodrome of clinical alterations (so that the instrument can be useful for their early detection), it may also constitute the first phase of a normal process of adaptation. As regards the term "adaptive resource", we refer to the set of dispositions, both internal and stable (e.g., personality traits) and external and modifiable (e.g., social support), that permit people to cope successfully with the situations and maintain or recover, in the different areas of life, the level of functioning they presented before the stressful event. In the field of chronic illness, adaptation is understood as the conjunction of apparently contradictory processes: on the one hand, the degree of stress or psychopathology derived from the diagnosis and the illness itself, and on the other, the experience of personal growth. Thus, a stressful life event can constitute, at the same time, an opportunity for personal growth or the cause of emotional maladjustment (Brennan, 2001).

The DERA is a 48-item instrument 5-point Likert-type scale response format. It is designed to measure the respondent's degree of agreement with a series of statements he or she is required to read. It can be applied individually or in groups to infertile men and women over the age of 18. Its application takes 10-15 minutes. With this single instrument, the psychologist can carry out a screening of the emotional state of the couple's members and of their personal and social resources, as well as assessing the congruence between the appraisals of the two members, which makes it possible to programme the psychological intervention or support appropriate to the case. Hence, the DERA can be one of the instruments included in the initial medical assessment of the infertile couple, an assessment required by the Spanish legislation on assisted reproduction treatment (*Ley sobre Técnicas de Reproducción Asistida*), which stipulates that treatment can only be applied to women in a good state of health. This would permit the solution, before beginning the assisted reproduction treatment, of any possible psychological problems in the more vulnerable couples. Given that the DERA is a screening instrument, in the case of scores indicating maladjustment the psychologist can carry out a clinical psychological assessment, aimed at corroborating or discarding the existence of psychopathological disorders. Naturally, the DERA is useful throughout the whole process of psychological assessment (Moreno-Rosset, 2005), since, apart from identifying infertile couples at risk, or with an already-developed psychopathology, it is sensitive to changes that may derive from the passage of time or from the psychological intervention itself, permitting the psychologist to corroborate the efficacy of the psychotherapy applied.

The DERA addresses several of the methodological deficiencies of the assessment instruments already referred to, given that: 1) through a single self-report measure we can obtain information on a range of psychological constructs; 2) it has been calibrated with various large samples representative of the infertile population; 3) it has proven psychometric properties of reliability and validity; 4) it permits assessment of the correlates most frequently mentioned in the literature on infertility; and 5) it allows assessment of both positive and negative aspects in the couple.

The instrument is made up of four factors, which measure: a) Emotional maladjustment (*Desajuste Emocional*, DE); b) Personal Resources (*Recursos Personales*, RP); c) Interpersonal Resources (*Recursos Interpersonales*, RI); and d) Adaptive Resources (*Recursos Adaptativos*, RA), the last of these constituting the sum of the two

Figure 1
The DERA Handbook

previous factors (RP and RI). For more details, see Moreno-Rosset, Jenaro and Antequera (2008).

Application of the DERA

The questionnaire can be applied either individually or in groups. Its items are designed to apply to both men and women respondents. If the instrument is applied to the couple together, it is important that each one responds individually.

After obtaining the total scores for each dimension, these are transformed into centile scores that permit us to determine the person's position in relation to the reference group. There are separate scales for men and women. Scores are entered on a profile sheet that gives a clear illustration of the similarities and differences in the profiles of the couple's members, as well as allowing us to identify more or less well-adjusted profiles and to determine whether or not they have resources for coping with the situation of infertility. All of this, as we explained above, is of great relevance to subsequent psychological intervention. In the example of the clinical case described in the DERA Handbook, reproduced here by permission of *TEA Ediciones* (see Figure 2), we can see that there are significant differences between Sara and Javier, Sara showing high emotional maladjustment and few coping resources, while Javier shows adequate emotional adjustment and adaptive resources, even though his interpersonal resources are fewer than his personal ones.

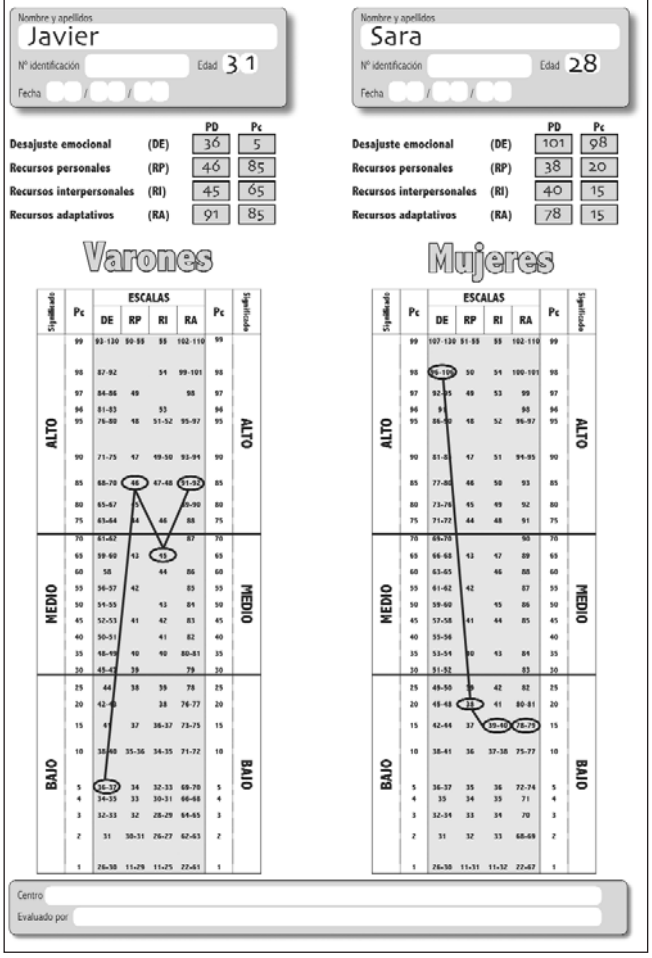
As regards the interpretation of the DERA, low scores in Emotional Maladjustment indicate that the person does not have a particular prevalence of negative emotions, and that he or she is free of psychopathological processes related to anxiety or to mood disorders. On the other hand, high scores in this dimension suggest the possible presence of cognitive, motor or physiological symptoms characteristic of negative emotional states, as well as feelings of insecurity about his or her capacity to cope successfully with the problems. Scores above centile 75 indicate the possible presence of problems of anxiety or depression that would require a more extensive clinical assessment.

Secondly, low scores in Personal Resources denote low disposition to take an active attitude to the problems and scarce conceptual flexibility in the analysis of the situations. As far as low scores in Interpersonal Resources are concerned, these reflect limitations in the social and support network, or indeed, distrust or isolation. The sum of the two factors gives the Adaptive Resources dimension. Low scores in this factor denote the absence of strategies for coping with stressful situations and maintaining emotional equilibrium. In contrast, high scores in the three factors related to resources suggest the existence of effective strategies and attitudes for coping with infertility and the associated treatments. Trust, perseverance or the perception of being valued, supported and appreciated by those around one are aspects that characterize people with high adaptive resources.

Possible additional uses of the DERA

The DERA represents seven years' research work focused on the analysis of the consequences of fertility problems (Moreno-Rosset, 2003, 2007) and on assessment-related aspects (Moreno-Rosset, Antequera & Jenaro, 2006a,

Figure 2
DERA Profile Sheet, showing how patterns of scores can be compared



2006b; Jenaro, Moreno-Rosset, Antequera & Ávila, 2007). However, up to now the samples used for its creation and calibration have been made up largely of couples involved in the initial phases of the assisted reproduction process. We are therefore currently working on increasing the sample size, in particular to include more couples who are in the advanced phases of the treatment process, or who have already experienced one or several failed treatments. Also, the samples used for calibration up to now have been recruited mainly from public fertility clinics; we are now recruiting much more from the private sector, bearing in mind that socio-economic, educational and cultural characteristics in the two sectors will presumably have differential effects on the experience of infertility and of assisted reproduction therapy, or even on the coping strategies used by patients, as suggested by some authors in the field (Fido & Zahid, 2004; Schmidt, Christensen & Holstein, 2005).

Furthermore, we believe that both the theoretical foundations and the content of the DERA make it an assessment instrument of considerable utility in the field of chronic illness in general. Indeed, we are currently applying this instrument in studies involving fibromyalgia and cancer patients and in populations with somatomorphic disorders.

In sum, assessment in infertility, the core of Reproductive Psychology, represents a new field for the psychologist, at both the research and applied levels, in a framework that could be called "care and quality of life improvement" in relation to people undergoing infertility treatment, since knowing their degree of adjustment and their available resources makes it possible to provide psychological treatment tailored to each case. We cannot stress this aspect too much, since it reflects the dual aspiration of the university: while striving for scientific excellence, to fulfil a useful social role through the solution of problems affecting contemporary society.

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