Well-being and distress related to social support and emotions in infertile women: A cross-cultural comparison between Sweden and Iran. ¹

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Abstract

The present survey study investigated cultural differences in social support, well-being, distress, positive and negative emotions in relation to infertility, by analyzing mean difference, correlation, regression and moderation on these variables. 117 women with primary infertility were recruited from fertility clinics in Sweden and Iran. Cultural differences were found regarding well-being and distress, indicating that infertility may pose a greater stigma in Iran than in Sweden. Even so, both samples reported high distress levels which confirmed infertility as a psychological stressor. Social support buffered against distress in the Swedish sample. Well-being was to a greater extent estimated by emotions in the Swedish sample, and by social support in the Iranian sample. Results were discussed in relation to aspects of individualism and collectivism.

Keywords: Infertility, well-being, distress, social support, emotions, culture.

Välbefinnande och distress i relation till socialt stöd och emotioner hos infertila kvinnor: En tvärkulturell jämförelse mellan Sverige och Iran.

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Sammanfattning

Den föreliggande enkätstudien undersökte kulturella skillnader i socialt stöd, välbefinnande, distress och positiva och negativa emotioner i relation till infertilitet, genom att analysera medelvärdesskillnad, korrelation, regression och moderation gällande dessa variabler. 117 kvinnor med primär infertilitet rekryterades på fertilitetskliniker i Sverige och Iran. Kulturella skillnader hittades gällande välbefinnande och distress, och indikerade att infertilitet kan utgöra ett större stigma i Iran än i Sverige. Båda grupperna rapporterade dock hög distress, vilket bekräftade infertilitet som en psykologisk stressor. Socialt stöd buffrade mot distress i det svenska urvalet. Välbefinnande estimerades till en högre grad av emotioner i det svenska urvalet, och av socialt stöd i det iranska. Resultaten diskuterades utifrån aspekterna individualism och kollektivism.

Nyckelord: Infertilitet, välbefinnande, distress, socialt stöd, emotioner, kultur.

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Well-being and distress related to social support and emotions in infertile women:

A cross-cultural comparison between Sweden and Iran

Infertility is classified, assessed and treated mostly as a medical condition, but it is experienced as a social and psychological phenomena as well (Hreinsson, Hamberger & Hardarson, 2005). It is not necessarily expressed through medical symptoms but rather through the absence of a desirable state (Greil, Slauson-Blevins & McQuillan, 2010), affecting both social functioning (Amir, Horesh & Lin-Stein 1999; Onat & Beji, 2012) and well-being (Farzadi, Mohammadi-Hosseini, Seyyed-Fatemi & Alikha, 2007; Lykeridou, Gourounti, Deltasidou, Loutradis & Vaslamatzis, 2009). The present study aims at investigating these social and psychological phenomena regarding infertility in relation to culture.

Infertility

World Health Organization, WHO, defines infertility as an inability to conceive. According to the WHO, a couple is considered clinically infertile after at least one year of unprotected intercourse without pregnancy (WHO, 2004). A couple unable to bear children, either due to inability to conceive, pregnancy followed by miscarriage or pregnancy followed by stillbirth, is diagnosed with primary infertility. When a couple with a previously confirmed pregnancy, either completed or aborted, have an inability to conceive after trying for a year, their infertility is defined as secondary infertility (ibid.). In clinical contexts, the term involuntary childlessness is often used as a synonym for infertility, since the term infertility may be perceived as only a medical condition, not including psychological and social aspects (Inhorn & Van Balen, 2002). In 25% of the infertile couples, the cause is related to the man, in 25% it is related to the woman, and in 25% of the infertile couples it is related to both the man and
the woman. In the remaining 25%, no cause can be found. In these cases, the infertility is defined as unexplained childlessness (Söderström-Anttila, 2009). The prevalence of infertility is 8-12% worldwide (Mascarenhas, Flaxman, Boerma, Vanderpoel & Stevens, 2012).

**Assessment and treatment.** The treatment phase begins with an assessment of possible causes of the infertility. This consists of a thorough inquiry of the couple’s medical history, a psychosocial survey of lifestyle situation and clinical examinations of both the man and the woman. The woman’s uterus, ovaries and passage of the fallopian tubes are examined and a hormonal survey of the menstrual cycle and the ovulation is made. The man’s semen is analyzed to provide information about quantity, movement and structure of the sperms. The assessment is used as a basis for determination of the infertility cause. According to the stated cause and the couple’s wishes, the treatment is further planned (Wihlbäck & Wulff, 2004). When the sperm sample is normal and there are no other suspicions about infertility cause than ovulation disruption, the fertility treatment is usually initiated with hormonal treatment. This treatment is primarily focused at stimulating the woman’s ovulation, and can provide substantial chances of pregnancy if no other causes that can negatively affect the fertility have been found (ibid.). If the hormonal treatment is not sufficient to achieve pregnancy, assisted reproduction may be relevant. The most common forms are insemination and in vitro fertilization, IVF. At insemination, prepared and washed sperm is injected into the woman’s uterus cavity during ovulation (Söderström-Anttila, 2009). IVF is the designation of several methods where conception occurs in glass with specific substrates. The woman is stimulated to ovulate by hormone supply whereafter mature follicles are extracted and fertilized with treated sperm in specific nutritious liquids. When conception is established through cell division, the pre-embryo is implanted into the uterus. IVF is among other things used for male infertility, egg donation and unexplained infertility (Hreinsson et al., 2005). Intracytoplasmic sperm injection, ICSI, refers to the microinjection of sperm. The conception occurs with the
sperm being injected into an extracted ovum. ICSI is a suitable treatment method when the sperm has a poor forward movement and when the sperm count is so low that it negatively affects the chance of a successful regular IVF-treatment (ibid.). Surgery is rarely applied in infertility treatment. In cases of adhesion of the uterus or benign tumor of the uterine muscle, surgical procedures are considered (Söderström-Anttila, 2009).

Usually, fertility treatment results in pregnancy; 80% of the care-seeking couples are helped in conceiving a child of their own (Söderström-Anttila, 2009). However, the success rate per treatment trial is low, in some cases leading couples to go through repeated trials and undergoing fertility treatment for several years (Benyamini, Gozlan & Kokia, 2004). Research shows that couples in infertility assessment and treatment may experience this as highly stressful and emotionally draining, and as a constant commuting between hope and despair (Abbey, Andrews & Halman, 1992). The hormonal treatment of the woman during IVF is demanding and may involve physical risks (Socialstyrelsen, 2005). According to recent studies, many couples quit fertility treatment before it is finished (Akyuz & Sever, 2009) and about 15-20% of all couples find the treatment so stressful that they seek psychological help (Boivin, 2003).

**Infertility and distress**

Infertility is usually associated with high stress, depression, guilt and anxiety (Connolly, Edelmann, Cooke & Robson, 1991; Lykeridou et al., 2009). Infertile men and women report higher levels of psychological distress compared to normative data from a general population (Morrow, Thoreson & Penney, 1995). *Psychological distress* refers to a non-specific negative state associated with anxiety and depression (CIHI, 2012). It is usually preceded by a stressor and involves coping-difficulties, discomfort and change in emotion (Ridner, 2004).
A study by Schmidt (2006) indicates that infertility and its subsequent treatment can deplete the individual’s relationships, reduce self-esteem and cause periods of existential crisis (Schmidt, 2006). Infertility involves a longing for a child that never arrives, and a grief that can be hard to process since there’s nothing tangible to mourn (Greil et al., 2010). It is a condition that can last indefinitely, that doesn’t have an obvious solution or end, and that often consists of a series of crisis-filled events (Whiteford & Gonzalez, 1995). In this way, infertility can be experienced as a chronic stressor, which for many couples develops into a chronic crisis (Schmidt, 2006; Söderström-Anttila, 2009; Whiteford & Gonzalez, 1995). The psychological effects of infertility resemble those experienced by people suffering from conditions such as cancer and HIV (Miles et al., 2008).

In comparison to men, women in infertile couples have lower self-esteem, higher levels of depression, feel less satisfied with life, blame themselves more often for the infertility, and to a higher degree don’t accept their infertility. Regardless of what’s causing the infertility, the woman is the focus of the treatment (Schmidt, 2006).

**Infertility and culture**

The meaning of infertility for the individual is highly affected by cultural factors such as norms, values and role expectations related to the culture in which the individual lives (Inhorn & Van Balen 2002; Lykeridou et al., 2009). Culture can broadly be defined in terms of shared operating procedures, traditions, values, norms, and such that have developed over time (Triandis, 2001).

**Roles and norms.** The female gender role has traditionally been associated with motherhood (Miles et al., 2008). Infertility can be viewed as a failure to live up to this role (Onat & Beji, 2012). Miles et al. (2008) found that infertile women strongly identifying with a traditional gender role, and women experiencing strong social pressure towards
motherhood, are more likely to experience psychological distress related to infertility (Miles et al., 2008). Childless women are generally considered to violate the norms of family formation (Lampman & Dowling-Guyer, 1996). Complying with common norms and standards is particularly important in collectivistic cultures where the group’s interests generally take priority over those of the individual (Triandis, 2001; Triandis, McCusker & Hui, 1990). Collectivism and individualism are important aspects of culture, with differences in dependency, relations between the individual and the group, and the function of relationships (Triandis, 2001). Family formation usually has a strong social and economical function in collectivistic cultures, and is related to increased status (Van Rooij, Van Balen & Hermanns, 2006). Voluntarily choosing to remain childless is in such a culture socially unacceptable (Onat & Beji, 2012). In individualistic cultures it is generally important for the individual to pursue personally set goals that may differentiate from those of the group, and to act upon one’s own attitudes rather than the shared norms (Triandis et al., 1990). In such cultures, the social pressure towards family formation may be less strong than in collectivistic cultures, since the desire for children is primarily founded in the individual’s pursuit of happiness and self-fulfillment. Choosing not to have children in individualistic cultures is to a greater extent respected, as family formation is not an equally strong norm as it is in collectivistic cultures (Van Balen & Bos, 2006).

**Stigma.** Infertility may pose a greater stigma in collectivistic cultures than in individualistic cultures, with social and psychological consequences (Miles et al., 2008; Yağmur & Oltuluoğlu, 2011). In these cultures, the woman may be accused and automatically assigned responsibility for the infertility (Van Rooij et al., 2006), resulting in women, to a greater extent than men, being stigmatized as a consequence of infertility (Yağmur & Oltuluoğlu, 2012). The stigmatization can result in childless women being socially rejected and perceived as unnatural and selfish (Hare-Mustin & Broderick, 1979).
Social support and well-being

Research has since long indicated that social support could provide a range of beneficial effects on well-being and health world-wide (Amir et al., 1999; Cohen & Wills, 1985; Lakey & Lutz, 1996; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Even so, some cultural differences have been found, with social support being a stronger predictor of well-being in collectivistic cultures than in individualistic cultures (Kitayama et al., 2000; Kwan, Bond, & Singelis, 1997; Uchida et al., 2008).

Well-being. Defining well-being concerns difficulties related to differences in philosophical traditions resulting in different approaches to, and measurements of, well-being. Despite some controversy on the subject of well-being, WHO (2012) states that it is multidimensional, related to health (with health being both a determinant and an outcome), and that it includes both subjective and objective elements. Objective well-being concerns objectively measurable factors regarding basic needs such as economic means, basic nutrition, protection from physical harm etc. Subjective well-being refers to the individual’s positive and negative evaluations of one’s life, both cognitive (e.g. “I live a meaningful life”) and emotional (e.g. “I feel content”) (Diener, 2012; WHO, 2012), which may be affected by, but not necessarily dependent on, objective elements. Although there are cultural differences in predictive factors of well-being, social support and fulfillment of basic needs are found to be world-wide predictors (Diener, 2012).

Subjective well-being is traditionally closely linked to positive emotions, such as happiness, which can increase the individual’s capacity to appreciate life and thus enhance the sense of well-being (Wong, 2011). In recent years research has pointed to the importance of negative emotions and suffering to well-being, and underlined that well-being cannot solely be defined by the absence of negative experience (ibid). Diener (2012) states that well-
being is not the algebra of the positive minus the negative, but the positive plus the negative. In this respect, adapting to a negative condition and transcending through a negative experience can provide an additional source of well-being to the traditionally positively based well-being (ibid). Thus, a demanding condition, such as infertility, may not automatically lead to a low subjective well-being, since this connection can be moderated by the individual’s ability to adapt and habituate to the circumstance. On the other hand, the adaptation may take several years, may not be complete or may not be applicable to some circumstances such as severe disabilities (Diener, 2012; Lucas, 2007).

**Social support.** Yağmur & Oltuluoğlu (2011) describes social support as a function of social relationships that are provided by the social system in which the individual is a member. Social support seems to include both quantitative and qualitative elements (Cohen & Willis, 1985; Pearson, 1986). The quantitative dimension of social support refers to the structure, frequency and function of the individual’s social network. Network size, number of interactions, and the length and complexity of relationships are all quantitative aspects of social support (Pearson, 1986). The qualitative dimension of social support refers to the subjective evaluation of the meaning of one’s relationships. Such qualitative aspects of relationships involve affection, feelings of reciprocity, and shared values or interests (ibid.).

Both the quantitative and the qualitative dimensions of social support are strongly correlated and predictive of subjective well-being (Diener & Ryan, 2009). According to research, moments of social interaction constitute the best parts of an individual’s day, simply indicating that people feel happier around other people (Kahneman & Krueger, 2006). General positive effects of social support may occur since the social network can provide positive affect through regular positive experiences, and a recognition of self-worth, as well as a sense of stability and predictability (Cohen, 1986).
The buffer hypothesis. Cohen and Willis (1985) make a distinction regarding the effects of social support, dividing social support into social network and perceived social support. Social support in terms of a (quantitatively) large social network is to a greater extent related to well-being on an everyday basis (“the main effect hypothesis”), while social support in terms of (qualitatively) close and supporting relationships is assumed to be more active in situations characterized by high stress, where the social support functions as a buffering factor towards the stress (“the buffer hypothesis”). Amir et al.’s findings (1999) support “the buffer hypothesis” by showing that social support can compose a buffer against psychological distress in the often highly stressful condition of infertility. Yağmur & Oltuluoğlu (2011) also confirms that social support can pose a buffer, by decreasing levels of hopelessness, and thus giving rise to better psychological health in women undergoing fertility treatment. Further, the need for social support increases with regard to the reported level of depression in infertile women. The experience of insufficient social support can correspondingly cause increased psychological suffering for the infertile couples (Fouad, 1989).

Infertility can lead to depression, lowered self-esteem, anger, shame and jealousy, which in turn can cause the individual to withdraw from social interaction and distancing from health promoting and supporting social relationships. In this way, the potential buffering effect that the social support can have is lost (Amir et al., 1999). An interview study from 2012 reports that infertile couples in Turkey avoid social interaction, are reluctant to meet friends and perceive themselves as stigmatized by others. Some couples kept the fertility treatment secret, since they experienced great social pressure or got treated less favorably by their families as a result of the infertility (Onat & Beji, 2012). The same study furthermore indicated that the support from the partner seemed to play a crucial role for all of the women after failed fertility trial (ibid.). Amir et al. (1999) also stresses the importance of the partner
relationship regarding social support in cases of infertility, considering that isolation from other social contexts is common in infertile couples (Amir et al., 1999).

**Interdependence and independence.** The cultural aspect of *interdependence* and *independence* have proven to be a significant moderator regarding the relationship between social support and well-being, where the effect of perceived social support varies depending on cultural context (Uchida, Kitayama, Mesquite, Reyes & Morling, 2008).

In individualistic cultures, individual happiness, independence, freedom and self-sufficiency are sought and highly valued (Realo, Koido, Ceulemans & Allik, 2002). In such cultures, well-being is strongly correlated with self-esteem (Uchida & Ogihara, 2012). Through internal attributes, such as personal abilities and qualities, the individuals distinguish themselves from their culture and thus obtain a personal sense of meaning. Kitayama et al. defines this as an *independent* view of self (Kitayama, Sevincer, Park, Karasawa & Uskul, 2009). In collectivistic cultures, social aspects of happiness are emphasized, as opposed to more personal aspects in individualistic cultures. Self-esteem is much less linked to well-being; instead relationships and interdependence are important factors when it comes to well-being (Kwan et al., 1997; Uchida & Ogihara, 2012) and the individual’s sense of meaning derives from a sense of belonging to the group. Conformity and maintenance of the harmony of the group are central aspects of what Kitayama et al. defines as an “interdependent” view of self (Kitayama et al., 2009).

Kitayama et al. (2009) implies that the view of self as either *independent* or *interdependent* provides a framework for general well-being. Perceived social support can have weak or no positive correlations with well-being in cultures that emphasize independence, since the view of the self as independent may then be contradicted (Uchida, 2008). Perceived social support has a weaker correlation to well-being in Western, individualistic cultures, than in Asian, collectivistic cultures. Studies on social support in the
United States has shown that social support can fail to benefit health and well-being, and that it can even result in negative feelings such as failure (Bolger & Amarel, 2007; Bolger, Foster, Vinokur, & Ng, 1996; Bolger, Zuckerman, & Kessler 2000; Fisher, Nadler, & Whitcher-Alagna, 1982; Seidman, Shrout, & Bolger, 2006). Cultures that emphasize mutual dependency have a clearer connection between perceived social support and well-being, since it underlines the importance of the self as interdependent and provides the individual with a sense of belonging (Kitayama et al., 2009; Uchida et al., 2008; Uchida & Ogihara, 2012).

Culture and emotions

The way in which different emotions are experienced and expressed varies depending on culture and context. Emotion can be defined as affect states involving patterns of psychological, cognitive and behavioral appraisals of, and reactions to, eliciting stimuli, often concerning individual motivations (Passer & Smith, 2003). Positive emotions are characterized by activity and engagement with the environment, pleasant events and contentment, whilst negative emotions are linked to stress, unpleasant events and poorer health (Kormi-Nouri et al., 2013).

Valuation of positive emotions. Studies show that positive emotions experienced in individualistic cultures are associated with personal success, confidence, well-being, health and an aspiration for positive experiences (Heine, Lehman, Markus & Kitayama, 1999; Kitayama, Markus & Kurokawa, 2000). In collectivistic cultures, however, a positive emotion such as happiness is not necessary perceived exclusively as “good” or wanted (Leu, Wang & Koo, 2011). Strong, positive emotions can even be associated with negative, social consequences such as jealousy, imbalance in social relations, and social punishment through shame and guilt (Uchida & Kitayama, 2009).
**Dialectic emotionality.** There are also cultural differences in how positive and negative emotions are related to each other. In individualistic cultures, the positive and negative emotions are usually thought of as two ends of a continuum, followed by the assumption that one cannot experience positive and negative emotions simultaneously (Green, Goldman and Salovey, 1993; Russell & Carroll, 1999). In collectivistic cultures, on the other hand, positive and negative emotions are seen more dialectically, assumed to be able to coexist (Williams & Aaker, 2002). Schimmack, Oishi & Diener (2002) demonstrates a conversely relationship between positive and negative emotions in a sample of North American participants, where the participants experienced either positive emotions or negative emotions, but not concurrently. In Asian participants, this connection was weak or non-existent, i.e. positive and negative emotions didn’t necessarily exclude each other (Schimmack, Oishi, & Diener, 2002).

**Situational differences in emotions.** Cultural differences in positive and negative emotions are primarily related to “pleasant” situations, in which members of a collectivist culture experience more mixed emotions and members of an individualist culture experience more positive emotions. However, these differences are not as apparent in “unpleasant” situations, in which members from both types of culture tend to experience the same amount of negative emotions. Thus, collectivistic and individualistic cultures seem to have more commonalities regarding negative emotions than positive emotions (Miyamoto, Uchida & Ellsworth, 2010; Uchida & Kitayama, 2009).

**Well-being and emotions.** In many collectivistic contexts, the goal regarding emotionality is moderation and balance between positive and negative emotions, while the emotional goal in individualistic cultures typically is maximization of positive emotions (Leu et al., 2011; Schimmack et al., 2002; Spencer-Rodgers, William & Peng, 2010). Kormi-Nouri, Farahani & Trost (2013) have compared levels of positive and negative emotions in
relation to subjective well-being in both Iranian and Swedish samples. The Iranian sample displayed higher levels of negative emotions, and the Swedish sample showed higher levels of positive emotions, while both groups reported equal levels of well-being. Positive emotions for the Swedish sample seemed to predict well-being, while a balance between positive and negative emotions seemed to predict well-being for the Iranian sample. The results are in line with Wong’s dual-systems model of emotions, where the ability to handle and combine both positive and negative emotions are emphasized in relation to well-being and a “good life” (Wong, 2011).

Aims of the present study
Societies of today are often described as multicultural, as an effect of increased globalization, geographic mobility, war and humanitarian crises (Crisp & Turner, 2010). In increasingly diverse societies, it is important to understand the impact that culture might have on conditions such as infertility. Understanding cultural differences regarding infertility is of high importance to guarantee adequate health care and proper comprehension of these patients. The overall aim of the present study is to investigate cultural differences in perceived social support, subjective well-being, psychological distress and positive and negative emotions in relation to infertility experienced in Sweden and Iran.

Well-being and distress. One aim of the present study is to examine Iranian and Swedish women’s subjective well-being and psychological distress while they are in fertility treatment. The level of distress caused by infertility may be affected by culturally shaped norms about family formation, leading to cultural differences in stigmatization. One can reason that this may produce a cultural difference in well-being and distress, and that Iranian infertile women could be more stigmatized than Swedish women and displaying lower levels
of well-being and higher levels of distress, although this effect is not possible to predict in a cross-sectional study.

Extended knowledge regarding infertile women's well-being and distress can contribute to increased understanding of how medical and psychological treatment should be designed in order to keep these already vulnerable patients from further suffering.

**Well-being and emotions.** The study also intends to investigate if there are any differences in the degree of positive and negative emotions in Iranian and Swedish women undergoing fertility treatment and how these emotions interact and may affect well-being and distress differently based on culture. With respect to previous research on cultural differences in the strive for emotional moderation or emotional maximization (Kitayama, et al., 2009; Kormi-Nouri et al., 2013), a cultural difference may be found in the present study, with the well-being and distress of Iranian women not being as affected by negative emotions as the well-being and distress of Swedish women. On the contrary, research indicates that these cultural differences are often observed in “pleasant” situations and may not be present in “unpleasant” situations (Miyamoto et al., 2010; Uchida & Kitayama, 2009). Since the research on cultural differences in emotions is divided, it was not possible to hypothesize on the relationship between well-being and emotions in the present study.

**Social support.** The present study further aims to examine cultural differences in levels of perceived social support in women undergoing fertility treatment. Since a collectivistic context depends on social networks and interdependency to a higher extent than an individualistic context (Uchida et al., 2008), there is a possibility that the Iranian women in the present study might report higher levels of social support than the Swedish women. On the other hand, one can reason that as a consequence of infertility in a collectivistic culture, infertile individuals that withdraw from their social networks to avoid stigmatization could report lower levels of social support.
**Social support, well-being and distress.** The study also aims at investigating the possible buffering effect of social support on the relationship between well-being and distress. Substantial research evidence the impact of social support as beneficial to well-being in stressful conditions such as infertility (Amir et al., 1999; Fouad, 1989; Yağmur & Oltuluoğlu, 2011), posing as a buffer against psychological distress. This effect of social support as a moderator may be stronger in the Iranian sample than in the Swedish sample in the present study, since Iran is a collectivistic culture where social support is important to well-being. On the contrary, a buffering effect may be equally strong in the Swedish sample since infertility is a condition characterized by high stress, in which social support is believed to be beneficial and important to anyone (Cohen & Willis, 1985). Since previous research gives different views on the effects of social support based on culture and situation, it is not possible to estimate such results for the present study. No hypotheses were made throughout the study.

**Research questions**

1. Are there any cultural differences regarding well-being, distress, social support, and positive and negative emotions in infertile women undergoing fertility treatment in Sweden and Iran respectively?

2. How can social support and possible differences in positive and negative emotionality affect well-being and distress in infertile women undergoing fertility treatment in Sweden and Iran respectively?

3. Can social support function as a moderator in the relationship between distress and well-being, buffering against distress?
Method and materials

Participants

Participants included in the study were women who received some kind of infertility related help at fertility clinics in Iran and Sweden. The study only involved women, since mainly women are focused in fertility treatment (Schmidt, 2006). Since Iran is regarded as a collectivistic culture in the same way as East Asian cultures, and Sweden is regarded as a highly individualistic culture (Berggren & Trädgårdh, 2006; Kormi-Nouri et al., 2013; Schimmack, Oishi & Diener, 2005), it is motivated to use an Iranian and a Swedish sample for comparison on cultural dimensions such as collectivism and individualism.

Sample characteristics. Sample characteristics are presented in Table 1. The present study included 117 participants (N(Sweden)=57; N(Iran)=60). In the Swedish sample, 90% were native born, and 10% were not native born but with a mean of 18 years of residence in Sweden. The main occupation for the Iranian participants was housewife (70%), followed by full-time employee (17%), part-time employee (7%), job-seeking (5%), and other (2%). The Swedish participants reported full-time employee (70%) as main occupation, followed by part-time employee (12%), student (10%), sick-leave (3%), other (3%), and job-seeking (2%). In both Iran and Sweden, most participants lived in urban areas (72% and 83% respectively) as opposed to rural areas (27% and 15% respectively). The main cause of infertility in the Swedish sample was related to the female (9% both, 14% male, 41% female, 36% unknown). The main cause of infertility in the Iranian sample was related to the female (22% both, 20% male, 33% female, 25% unknown). For the Iranian participants, satisfaction with partner relationship was a mean score of 8.7 on a 10-point Likert scale. The mean score for the Swedish participants was 9.3.

Seven cases from the Swedish sample were excluded, due to no diagnosis of primary infertility or previous history of hospitalization for psychiatric treatment. One case was
excluded from the Iranian sample, due to no diagnosis of primary infertility. 200 questionnaires were distributed in each country respectively. Since the data collection exceeded the time frame of the present study, it was not possible to report the total number of participants submitting the questionnaires. No answering rate could therefore be presented.

<table>
<thead>
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<th>TABLE 1</th>
<th>Sample characteristics for Swedish and Iranian samples</th>
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<td>Sweden</td>
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<td>N</td>
<td>57</td>
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<tr>
<td>Age-range (years)</td>
<td>22-41 (M=32)</td>
</tr>
<tr>
<td>Native born</td>
<td>90%</td>
</tr>
<tr>
<td>Main occupation</td>
<td>70% full-time employee</td>
</tr>
<tr>
<td>Income</td>
<td>Low (7%) Average (24%) High (66%)</td>
</tr>
<tr>
<td>Place of residence</td>
<td>Urban (83%)</td>
</tr>
<tr>
<td>Main cause</td>
<td>Female (41%)</td>
</tr>
<tr>
<td>Duration of treatment (years)</td>
<td>0-5 (M=1)</td>
</tr>
<tr>
<td>Duration of diagnosis (years)</td>
<td>0-15 (M=2)</td>
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<tr>
<td>Satisfaction with partner relationship</td>
<td>93%</td>
</tr>
<tr>
<td>Family’s awareness of infertility</td>
<td>78%</td>
</tr>
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</table>

**Criteria for inclusion and exclusion.** Inclusion criteria regarding participation in the study were confirmed primary infertility diagnosis (i.e. active attempts to pregnancy without success, and no previous biological children) and commenced fertility treatment at a fertility clinic. Since the study aimed at investigating infertility related effects in childless women not wanting to stay childless, these criteria of diagnosis in combination with initiated treatment were motivated. Studies show that this group experience significant psychological distress compared to normative data (Morrow et al., 1995). Since significant cultural differences previously have been stated regarding positive and negative emotions in relation to well-being
in other samples (Kormi-Nouri, 2013), a cross-cultural comparison of involuntarily childless women was of interest.

Exclusion criteria for participation in the study were a level of education lower than high school and previous history of hospitalization for psychiatric treatment. Since the study is based on data from questionnaires, it was crucial that the participants fully understood all of the written instructions to correctly fill in the questionnaires, which motivated the criteria regarding level of education. Severe psychological disorder was excluded on the basis of risks of disruptive third variables regarding the relation between infertility, social support and with depression and anxiety.

Procedure

Recruitment. One hundred seventeen participants were recruited from fertility clinics in Sweden and Iran. Staff at the clinics asked patients about their interest to participate in the study, and the patients interested in participating received an information sheet with easily comprehensible information about the study. The information also stated that the patients’ care at the clinic would not be affected by their choice to participate or not. Participation was anonymous and voluntarily. Participants who wanted to receive a ticket to the cinema in exchange for their participation filled out a separate form with name and address. The form was separated from the survey material when submitted, which ensured that no results could be linked to the participant.

Data collection. The staff at the clinics distributed the survey materials consisting of 10 questionnaires for the participants to fill out at home, together with a return envelope. The order of the questionnaires in the survey material was randomized. Participants acknowledged their informed consent to their responses being used in the present study when submitting the completed materials. The questionnaires were coded when submitted.
**Ethical considerations.** Ethical approval applications were submitted to ethical approval boards in both Sweden and Iran before distribution of the survey materials. Both applications were approved. The present study was completely anonymous. All submitted questionnaires were coded, and results were reported at group level so that no individual participants could be identified.

Infertility is often experienced as a stressful condition, and several patients enrolled in fertility treatment discontinue their treatment due to physical, psychological and financial stress (Schmidt, 2006; Söderström-Anttila, 2009). Extended knowledge of infertile women’s well-being and how perceived social support can affect levels of distress and well-being differently in different cultures, could contribute to a better understanding and treatment of these vulnerable patients. Answering questions about one’s infertility could be psychologically painful, considering that infertility may be a sensitive topic for those diagnosed with this condition. The survey material was adapted to the patient group by taking into account comments provided by health care professionals at the clinics, in order to minimize further psychological suffering. All of the participants in the study were registered at fertility clinics and had access to personnel providing psychological treatment, which was considered a precautionary action. Participation may even have resulted in positive gains in terms of increased insight and a broader understanding of one’s condition. The above considerations, as well as benefits in terms of contributions to the field, applicable on both medical and psychological health care, were considered to outweigh the ethical issues of the study.

**Data analysis.** Data analyses were performed using SPSS version 17.0 (SPSS, 2008). *Missing values* were missing completely at random in both the Iranian and the Swedish samples, which was established by performing Little’s MCAR test. Missing scores were replaced through Expectation-Maximization, *EM*. In five to seven cases in the Iranian data
set, data was completely missing at whole subscales. After analyzing normality and comparing results from data with all missing values replaced, to data with no missing values replaced, it was concluded that data was less normally distributed when all missing values were replaced. This motivated not replacing these values in the Iranian data. Smaller sample size and lower power was motivated by better normality distribution. Outliers and extreme values were examined by investigating descriptives, extreme values, histograms and box plots. Two cases were excluded from the Swedish sample, since there were reasons to believe that these cases were non-representative of the sample. No cases were excluded from the Iranian sample due to outliers.

When examining mean differences and correlations, normality was assessed using Kolmogorov-Smirnov’s test of normality, and by visual inspection of normal Q-Q-plots and histograms, showing mostly negatively skewed distribution of data for both the Swedish and the Iranian sample. Normality transformations were performed using reversed scores transformation on Log transformation as well as Square root transformation (Field, 2009). Normality analyses were performed on both transformed and non-transformed data, as well as Levene’s test of homogeneity of variance regarding the Swedish and the Iranian data. Since the transformed and the non-transformed data did not differ noticeably, results presented in the previous study are from the non-transformed data.

To investigate mean differences based on culture, regarding well-being, psychological distress, social support, positive and negative emotions, the non-parametric Mann-Whitney test was performed, comparing medians between the Iranian and the Swedish samples. Since the assumption of homogeneity of variance only was supported on half of the scales, according to Levene’s test of homogeneity, and the assumption of normality was not met at most of the scales, the use of non-parametric tests was motivated for both mean differences and correlations. Analyses on correlational aspects regarding social support, positive and
negative emotions, well-being and distress were made by computing the non-parametric Spearman’s rho. *Linear regression analyses* were conducted, aiming at estimating relationships between social support, positive and negative emotions, and well-being among Swedish and Iranian women. The assumption of *homoscedasticity* was not met at some variables. A *moderation analysis* was performed using the *PROCESS* dialog box (Hayes, 2013), with social support as moderating variable in the relationship between distress and well-being, in both the Iranian and the Swedish sample. The use of the parametric tests of linear regression and moderation was motivated by *normally distributed residuals*.

**Materials**

The present study was part of a more extensive project (Zahraie, 2013) where the following questionnaires were used: Demographic Questionnaire, Morisky Medication Adherence Scale-8 items, D-personality Scale-14 items, Illness Perception Questionnaire-Infertility, Survival of Marital Life Questionnaire, Coping Inventory for Stressful Situations, Flourishing Scale, Scale of Positive and Negative Experience, Hospital Anxiety and Depression Scale and Multidimensional Scale of Perceived Social Support. Of the distributed questionnaires, only the ones used to analyze data in the present study are described below.

**Demographic Questionnaire.** The demographic questionnaire is designed by Zahraie (2013) and translated from Persian to English and from English to Swedish. The questionnaire provides information on background variables and includes questions regarding ethnicity, relationship status, education, occupation, income, infertility diagnosis, medical treatment and medical history.

**Flourishing Scale, FS.** The term flourishing refers to a subjective experience of life going well, with emphasis on effective functioning in combination with feeling good. By adding the construct of flourishing to the measurement of well-being, Diener has enriched the
concept of well-being to comprise more than mere emotions (Huppert & So, 2013). The Flourishing Scale (Diener et al., 2010) includes eight items designed to measure subjective well-being on the basis of different important areas of human life, such as relationships, engagement, competence, optimism, self-esteem, purpose and contribution to well-being of others. The participants respond to eight different positively phrased statements on a 7-point Likert scale ("strongly disagree"; “disagree”; “slightly agree”; “neither agree nor disagree”; “slightly agree”; “agree”; “strongly agree”).

FS strongly correlates with other scales on well-being, and has good psychometric characteristics. Cronbach’s alpha of the scale is a good .87 and temporal reliabilities are moderately good (Diener et al., 2010). A principal axis factor analysis shows that the scale is characterized by one single strong factor (ibid.). In the present study, Swedish and Persian versions of the FS were used that showed good reliability from previous research (α=.87 for the Swedish version, and α=.85 for the Iranian version) (Kormi-Nouri et al., 2013).

**Scale of Positive and Negative Experience, SPANE.** The SPANE (Diener et al., 2010) measures subjective emotions and consists of 12 items, divided into scores for positive (six items) and negative (six items) emotions. Both the negative and the positive items are divided into three general items (e.g. negative, positive) and three specific items (e.g. sad, joyful) respectively. The SPANE was used in the present study instead of the more commonly used Positive and Negative Affect Schedule, PANAS (Watson et al., 1988), due to the instability of the PANAS that measures feelings of different intensity but with equal weighting. Also, the more specific items of emotional expressions forming the PANAS can obscure the fact that respondents may experience certain emotions but expressing them differently (Diener et al., 2010). The inclusion of general items to the SPANE undermines the possibility of cultural biases due to cultural differences in specific expressions of emotions, enabling a better cultural comparison. The SPANE assesses negative and positive experiences
INFERTILITY: A CROSS-CULTURAL COMPARISON

and emotions widely, converge well with other measures of emotions and well-being and is consistent through different cultures (ibid.). The 12 items are rated on a 5-point Likert scale, ranging from one (“very rarely or never”) to five (“very often or always”), and the respondents are asked to base their answer on the amount of emotions experienced the last month.

For the present study a Swedish and an Iranian version of SPANE was used, with previous good reliability measures on the scale for positive emotions (α=.86 for the Iranian version, and α=.82 for the Swedish version) and on the scale for negative emotions (α=.85 for the Iranian version, and α=.84 for the Swedish version) (Kormi-Nouri et al., 2013).

Hospital Anxiety and Depression Scale, HADS. The HADS (Zigmond & Snaith, 1983) is used to measure distress in both psychiatric and medical patients. It includes 14 items divided into two subscales; one for anxiety, HADS-A, and one for depression, HADS-D. The items are phrased as statements, to which the respondent rate the degree of consent regarding the last week on a 4-point (0-3) response category. Cut-off scores are low=8, moderate=11 and severe=16 for total scores on the HADS (ibid). Normative data on the HADS from a non-clinical female sample (N=978, age M=41.5) is available (M= 9.82, SD = 5.98) (Crawford, Henry, Crombie, & Taylor, 2001). For this study a Swedish version was used with alphas of .85 on the HADS-A and .83 on the HADS-D (Brink, Alsén, & Cliffordson, 2011). The Persian version used for the Iranian sample also demonstrates good reliability, with Cronbach’s alpha coefficients .78 on the HADS-A and .86 on the HADS-D (Montazeri, Vahdaninia, Ebrahimi, & Jarvandi, 2003).

Multidimensional Scale of Perceived Social Support, MSPSS. The MSPSS (Zimet, Dahlem, Zimet, & Farley, 1988) is designed to measure the individual’s level of perceived social support, and consists of 12 items phrased as statements about social relations with significant other, friends and family. The respondent rates each statement on a 7-point Likert
scale (“very strongly disagree”; strongly disagree”; mildly disagree”; “neutral”; mildly agree”; “strongly agree”; “very strongly agree”). Cut-off scores for social support are low=12-48, moderate=49-68, and high=69-85 (ibid).

The scale has shown strong test - retest reliability and has good internal consistencies on the subscales ($\alpha=.91$ on the significant other scale, $\alpha=.85$ on the friends scale, and $\alpha=.87$ on the family scale) (Zimet, Powell, Farley, Werkman, & Berkoff, 1990). For the present study a Swedish version (Palmetun-Ekbäck, Benzein, Lindberg, & Årestedt, submitted 2013) was used that has shown good reliability ($\alpha=.78$ on the significant other scale, $\alpha=.93$ on the friends scale, and $\alpha=.94$ on the family scale). These results are consistent with results of the Iranian version used in the present study ($\alpha=.78$ on the significant other scale, $\alpha=.93$ on the friends scale, and $\alpha=.92$ on the family scale) (Zahraie, 2013).

**Results**

**Question 1**

*Are there any cultural differences regarding well-being, distress, social support, and positive and negative emotions in infertile women undergoing fertility treatment in Sweden and Iran respectively?*

On the distress scale, women in the Swedish sample reported moderate distress ($M=11.82$) and women in the Iranian sample reported severe distress ($M=17.55$), according to cut-off scores provided for clinical populations (Snaith & Zigmond, 1994). The Iranian women reported distress scores that were 1.29 standard deviations higher than results from a non-clinical female sample ($M=9.82, SD = 5.98$), and the Swedish women reported distress scores that were 0.33 standard deviations higher than the normative data. According to cut-off scores on the social support scale (Zimet et al., 1988), the Swedish women reported high
social support ($M=74.81$), and the Iranian women reported moderate social support ($M=63.16$).

**Median differences.** A Mann-Whitney test revealed significant median differences between the Swedish and Iranian participants in *distress, social support, social support from friends, social support from significant others, positive emotions, negative emotions* and *well-being*. The median value of *social support from family* did not differ significantly between the Swedish and the Iranian participants. The results are presented in Table 2.

### TABLE 2  Mann-Whitney U-test results for Iranian and Swedish samples

<table>
<thead>
<tr>
<th>Studied variable</th>
<th>IRAN $Mdn(N)$</th>
<th>SWEDEN $Mdn(N)$</th>
<th>Z-value</th>
<th>Mann-Whitney $U$</th>
<th>$r$</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being</td>
<td>45(60)</td>
<td>48(57)</td>
<td>-2.54</td>
<td>1244.5</td>
<td>.23</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Distress</td>
<td>18(53)</td>
<td>11(57)</td>
<td>-3.77</td>
<td>880</td>
<td>.36</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social support</td>
<td>67.6(54)</td>
<td>78(57)</td>
<td>-4.73</td>
<td>738.5</td>
<td>.45</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social support from family</td>
<td>24(54)</td>
<td>26(57)</td>
<td>-1.19</td>
<td>1338.5</td>
<td>.11</td>
<td>ns</td>
</tr>
<tr>
<td>Social support from friends</td>
<td>18(54)</td>
<td>26(57)</td>
<td>-5.17</td>
<td>668</td>
<td>.49</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social support from significant other</td>
<td>26(54)</td>
<td>28(57)</td>
<td>-5.47</td>
<td>698</td>
<td>.52</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Positive emotions</td>
<td>18(55)</td>
<td>23(57)</td>
<td>-4.85</td>
<td>736</td>
<td>.46</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Negative emotions</td>
<td>15(55)</td>
<td>17(57)</td>
<td>-2.06</td>
<td>1215</td>
<td>.19</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

*Note: $Mdn=median, (N)=number of participants, r= effect size, ns= none significant*

**Differences in the relationship between positive and negative emotions.** For the Swedish sample, positive and negative emotions were strongly negatively correlated ($\rho=-.54, p<.001$). In the Iranian sample, there was no significant correlation between positive and negative emotions. These results are presented in Tables 3.1 and 3.2. Figure 1.1 and 1.2 visualizes these relationships.
Question 2

How can social support and possible differences in positive and negative emotionality affect well-being and distress in infertile women undergoing fertility treatment in Sweden and Iran respectively?

The below results for the Swedish sample are presented in Table 3.1 and in Table 3.2 for the Iranian sample.

**Emotions and well-being.** Well-being showed a strong positive correlation with positive emotions in the Swedish sample (ρ=.54, p<.001), and a yet stronger negative correlation with negative emotions (ρ=−.63, p=.001). In the Iranian sample, well-being displayed no significant correlation with negative emotions, but correlated positively with positive emotions (ρ=.37, p<.01).

**Emotions and distress.** In both the Iranian and the Swedish sample, distress correlated positively with negative emotions (ρ=.41, p<.01; ρ=.71, p<.001) and negatively...
with positive emotions ($\rho = -0.44$, $p < 0.001$; $\rho = -0.59$, $p < 0.001$), with large correlations in the Swedish sample, and moderate to large correlations in the Iranian sample.

**Distress and well-being.** There was a strong negative correlation between distress and well-being, with high levels of distress associated with lower levels of well-being, for both the Swedish and the Iranian sample ($\rho = -0.66$, $p < 0.001$; $\rho = -0.59$, $p < 0.001$).

**Social support and well-being.** Social support did not significantly correlate with well-being in the Swedish sample, but displayed a small to moderate significant positive correlation with well-being for the Iranian sample ($\rho = 0.29$, $p < 0.05$). Social support from a significant other showed a moderate to strong positive correlation with well-being in the Iranian sample ($\rho = 0.48$, $p < 0.001$) and a small to moderate positive correlation in the Swedish sample ($\rho = 0.27$, $p < 0.05$). Neither social support from friends nor social support from family correlated significantly with well-being in the Iranian or the Swedish sample.

**Social support and distress.** Of the social support scales, only social support from significant other correlated significantly with distress in the Swedish sample, displaying a moderate to strong effect size ($\rho = -0.27$, $p < 0.05$), whereas all social support scales except for social support from friends, correlated significantly with distress in the Iranian sample, showing a moderate to strong effect size ($\rho_{(social\ support)} = -0.38$, $p < 0.01$; $\rho_{(significant\ other)} = -0.52$, $p < 0.001$; $\rho_{(family)} = -0.28$, $p < 0.05$).
TABLE 3.1 Spearman’s rho correlation coefficients for the Swedish sample

<table>
<thead>
<tr>
<th></th>
<th>Well-being</th>
<th>Positive emotions</th>
<th>Negative emotions</th>
<th>Distress</th>
<th>Social support</th>
<th>Social support from family</th>
<th>Social support from friends</th>
<th>Social support from significant other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being</td>
<td>1</td>
<td>.54***</td>
<td>-.63***</td>
<td>-.66***</td>
<td>.20</td>
<td>.12</td>
<td>.22</td>
<td>.27*</td>
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<td>N=57</td>
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<td>N=57</td>
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<tr>
<td>Positive emotions</td>
<td>.54***</td>
<td>1</td>
<td>-.54***</td>
<td>-.59***</td>
<td>.36**</td>
<td>.30*</td>
<td>.31*</td>
<td>.23</td>
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<tr>
<td>Negative emotions</td>
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<td>-.59***</td>
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<td>-.19</td>
<td>-.22</td>
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<td>N=57</td>
</tr>
<tr>
<td>Social support from family</td>
<td>.20</td>
<td>.36**</td>
<td>-.22</td>
<td>-.20</td>
<td>1</td>
<td>.87***</td>
<td>.78***</td>
<td>.30*</td>
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<td>-.19</td>
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</tbody>
</table>

Note: N= number of participants, * p < .05; ** p < .01; *** p ≤ .001

TABLE 3.2 Spearman’s rho correlation coefficients for the Iranian sample

<table>
<thead>
<tr>
<th></th>
<th>Well-being</th>
<th>Positive emotions</th>
<th>Negative emotions</th>
<th>Distress</th>
<th>Social support</th>
<th>Social support from family</th>
<th>Social support from friends</th>
<th>Social support from significant other</th>
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<td>.37**</td>
<td>-.19</td>
<td>-.59***</td>
<td>.29*</td>
<td>.18</td>
<td>.18</td>
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<td>-.28*</td>
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<td>.91***</td>
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Note: N= number of participants, * p < .05; ** p < .01; *** p ≤ .001
**Estimations of well-being.** In the Swedish sample, *positive emotions* significantly estimated well-being ($\beta=.60, t(54)=5.59, p<.001$) and explained a significant proportion of variance in well-being ($R^2=.36, F(1,55)=31.29, p<.001$). Positive emotions also significantly estimated well-being in the Iranian sample, but to a lesser degree ($\beta=.30, t(52)=2.31, p<.05$). In the Iranian sample, positive emotions explained some of the variance in well-being ($R^2=.09, F(1,53)=5.34, p<.05$). In the Swedish sample, *negative emotions* significantly estimated well-being ($\beta=-.63, t(54)=-5.97, p<.001$) and explained a significant proportion of variance in well-being ($R^2=.39, F(1,55)=35.64, p<.001$). Negative emotions did not significantly estimate well-being in the Iranian sample. These results are presented in Table 4 and in Figure 2.

*Social support* significantly estimated well-being in the Iranian sample ($\beta=.41, t(51)=3.21, p<.005$) and explained a significant proportion of variance in well-being ($R^2=.17, F(1,52)=10.32, p<.005$). In the Swedish sample social support did not significantly estimate well-being. *Social support from significant other* significantly estimated well-being in the Iranian sample ($\beta=.60, t(54)=2.39, p<.001$) and explained a significant proportion of variance in well-being ($R^2=.36, F(1,52)=28.74, p<.001$). Social support from significant other did also estimate well-being in the Swedish sample ($\beta=.31, t(51)=5.36, p<.05$) and explained some proportion of variance in well-being in the Swedish sample ($R^2=.09, F(1,55)=5.72, p<.05$). *Social support from family* did not significantly estimate well-being, in either the Swedish or the Iranian sample. *Social support from friends* did estimate well-being in the Iranian sample ($\beta=.28, t(51)=2.12, p<.05$) and a small proportion of the variance in well-being could be explained by social support from friends ($R^2=.08, F(1,52)=4.50, p<.05$). For the Swedish sample social support from friends did not significantly estimate well-being. Results are presented in table 4 and in Figure 2.
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<td>2.97</td>
<td>.16</td>
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*Note: *$p<.05$; **$p<.01$; ***$p<.001$

**FIGURE 2** Emotions and social support explaining proportion of variance in well-being

Figure 1.3. Social support predicted well-being to a larger degree in the Iranian sample, while emotions predicted well-being to a larger degree in the Swedish sample.
Question 3

*Can social support function as a moderator in the relationship between distress and well-being, buffering against distress?*

Figure 3.1 shows an overview of a moderation model. Results from the moderation analysis are presented in Tables 5.1 and 5.2, and in Figure 3.2.

**Social support as a moderator between distress and well-being.** Moderation was shown through a significant interaction between the variables distress and social support predicting well-being in the Swedish sample ($\beta = .03$, 95% CI [.00, .06], $t = 2.14$, $p < .05$). In the Iranian sample there was no significant interaction between the variables distress and social support. These results are presented in Table 5.1. The nature of this interaction was explored by a simple slopes analysis, investigating the conditional effect of distress on well-being at different levels of social support in the Swedish sample. This result is shown in Table 5.2. When social support was low, there was a significant strong negative relationship between distress and well-being ($\beta = -1.07$, 95% CI [-1.52, -.63], $t = -4.82$, $p < .001$). At the mean value of social support, there was a significant negative relationship between distress and well-being ($\beta = -.72$, 95% CI [-.98, -.47], $t = -5.66$, $p < .001$). There was also a significant negative relationship between distress and well-being in the Swedish sample when social support was high ($\beta = -.41$, 95% CI [-.77, -.06], $t = -2.33$, $p < .05$), but not as strong as when social support was high or at mean value. These results could indicate that there was an interacting, buffering effect of social support on the relationship between distress and well-being in the Swedish sample, but it could also be interpreted as weak social support being a risk factor for decreased well-being due to distress, since there was a negative relationship between distress and well-being at all levels of social support.
TABLE 5.1 Linear model of predictors of well-being

<table>
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<th>SE B</th>
<th>t</th>
<th>p</th>
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<td>.13</td>
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<tr>
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<td>[-.98, -.47]</td>
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<td>Distress × Social support</td>
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<td>.02</td>
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<td>Social support (centered)</td>
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<td>.77</td>
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<td>[-.11, .24]</td>
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<td>Distress (centered)</td>
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<td>.14</td>
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<td>Distress × Social support</td>
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TABLE 5.2 Prediction of well-being at three levels of social support in the Swedish sample

<table>
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<td>[ -1.52, - .63]</td>
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<td>Mean social support</td>
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<td>[ -.77, -.06]</td>
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Figure 3.1 Moderator model

Figure 2.1. When there is an interaction effect between the predictor (distress) and the moderator (social support), affecting the outcome (well-being), the moderator has an impact on the relationship between the predictor and the outcome (line c), showing a moderator effect.
Discussion

Well-being and distress

The Iranian participants displayed slightly lower levels of well-being and higher levels of distress than the Swedish participants, which is in line with the expected outcome. These results may be due to that Iranian women are more stigmatized than Swedish women because of their infertility, and hence to a greater extent experience distress from social pressure and failure to comply with traditional gender roles and expectations of child-bearing (Miles et al., 2008; Yağmur & Oltuluoğlu, 2011).
The Swedish women were in general experiencing moderate distress and the Iranian women were experiencing severe distress. Comparing these levels of distress to levels of a non-clinical normative female sample, indicates that both the Swedish and the Iranian women in the present study are experiencing more distress than women from a normative sample. This could imply that the infertility together with the fertility treatment is affecting the infertile women’s levels of distress, regardless of culture, which supports the assumption of infertility as a global psychological stressor.

Well-being and distress related to emotions

The results of the study underline the existence of cultural differences in the effect of emotions on well-being and distress. To a great extent, negative emotions negatively affected well-being in the Swedish sample, but did not affect well-being in the Iranian sample at all. Positive emotions estimated well-being, as well as negative emotions estimated distress, to a greater extent in the Swedish sample than in the Iranian sample. These results support previous research on well-being being predicted by emotions to a higher degree in individualistic contexts than in collectivistic contexts (Heine et al, 1999, Kitayama et al, 2000). The results could also be explained by previous research on strong positive emotions sometimes being related to negative social consequences in collectivistic contexts (Uchida & Kitayama, 2009), why positive emotions not necessarily leads to well-being in such contexts.

The results also underline findings of members of collectivistic cultures being more able than members of individualistic cultures to cope with negative and positive emotions simultaneously. This could imply that members of collectivistic cultures, such as the Iranian women in the present study, are better able to handle infertility related negative emotions, without the negative emotions automatically lowering well-being. This implication is further supported by the results on the predictive effect of positive emotions on negative emotions,
and vice versa, where positive and negative emotions negatively predicted each other to a great degree in the Swedish sample, but not at all in the Iranian sample, indicating that positive and negative emotions are experienced as opposite poles on a continuum in Sweden but are experienced simultaneously in Iran.

Even if there is some evidence suggesting that cultural differences in emotionality may be less apparent in a situation characterized as “unpleasant” (Miyamoto et al., 2010; Uchida & Kitayama, 2009), the results of the present study indicate that there are in fact such differences between Swedish and Iranian women undergoing fertility treatment. This could suggest that infertility not automatically should be considered to be an “unpleasant” situation. On the other hand, both samples displayed high levels of distress, indicating that infertility poses a real threat to well-being. The result could instead be due to actual significant differences in dialectic emotionality that may in fact be even more apparent in an unpleasant situation that puts high demands on the individual’s ability to handle negative emotions. These results of cultural differences in dialectic emotionality being present also in a condition involving high distress, brings additional information to the field.

Social support

Since the Iranian culture can be defined as more dependent on social networks and interdependency than the Swedish, more individualistic culture, Iranian women reporting higher levels of social support than the Swedish women would be expected. On the contrary, the Iranian participants reported lower levels of social support than the Swedish participants. This could be a result of the Iranian infertile women being stigmatized, as their infertility is viewed as violating the shared, cultural norm of family formation; a strongly held cultural belief and practice in collectivistic cultures (Onat & Beji, 2012; Van Rooij, 2006). Stigmatization and other experiences of social pressure toward the desired state of conceiving
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a child, could induce a withdrawal from social interaction, and hence explain these women’s lower levels of reported perceived social support.

**Social support related to well-being and distress**

As expected, social support had stronger relationships to well-being and distress among the Iranian women than among the Swedish women. This can be explained by cultural differences related to individualism and collectivism, where well-being of members of an individualistic culture is more related to subjective emotions and independence, and well-being of members of a collectivistic culture is more related to social support and interdependence (Kitayama et al., 2009; Uchida, 2008; Uchida & Ogihara, 2012). It was expected that social support would have a positive relationship to well-being and a negative relationship to distress in both cultural groups, although to various degrees. Surprisingly, even if the Swedish participants reported high levels of social support, according to cut-off scores (Zimet et al., 1988), social support did not positively estimate well-being and negatively estimate distress at all in the Swedish sample. Possibly, the Swedish women’s view of self, as members of an individualistic culture, where independence is premised, is contradicted by high social support, thus leading to no positive effects of social support on well-being (Uchida, 2008).

Although to a lesser extent than among the Iranian women, social support from a significant other estimated well-being among the Swedish women, indicating that social support from one’s partner can affect the individual’s evaluations of one’s life, regardless of culture. Social support from a significant other negatively estimated distress among the Iranian women to a great extent, but not at all among the Swedish women, indicating that support from one’s partner can affect distress in the Iranian sample. This could be due to infertile women being more stigmatized in Iran than in Sweden, leading to the support from
one’s partner being a more important source of support when individuals withdraw from other sources of social support.

There was a negative relationship between distress and well-being, both in the Iranian sample and in the Swedish sample, which confirms a global negative effect of distress on well-being and of well-being on distress. Thus, this effect was slightly larger in the Swedish sample, which could be due to individuals of an independent culture being biased to consider well-being, per definition, as a state without distress. In such a culture, experiencing conditions characterized by negative emotions is closely linked to the impossibility of well-being, since well-being is largely defined by the maximization of positive sensations, which might produce these cultural differences regarding well-being and distress. This complies with previous research on members of an individualistic context being poorly capable to balance positive and negative emotions (Shimmack et al., 2002, Wong, 2011).

Social support is thought to be beneficial to well-being, and posing a buffer against distress (Yağmur & Oltuluoğlu, 2011). In the present study, social support affected the relationship between distress and well-being at all levels of social support in the Swedish sample. When social support was high, it weakened the effect of distress on well-being, meaning that distress would not lower levels of well-being to the same extent when the individual experiences adequate social support as when social support is low. When social support was low or moderate, the effect of distress on well-being was strengthened, indicating that individuals with low social support are less able to handle negative experiences and maintain a positive state of mind. This result indicates that social support could pose as a protective factor against psychological distress in an individualistic culture, and that it is related to psychological health not only in collectivistic cultures. On the other hand, it could also imply that low social support simply constitutes a risk factor for lower well-being, since
the negative relationship between distress and well-being was present at all levels of social support.

Even if social support was found to have strong relationships to both well-being and distress in the Iranian sample, it was not found to have a significant moderator effect. This could be explained by the Iranian women experiencing more distress and lower levels of well-being than the Swedish women, why social support might not have been sufficient to significantly buffer against the impact of distress on well-being. Also, the Iranian participants reported lower levels of social support, compared to the Swedish participants, which supports this assumption of social support not being powerful enough to act as a buffer against distress.

**Limitations and strengths**

The design of the present study was cross-sectional and not longitudinal, which limited the predictive possibilities and made it impossible to make any causal estimates.

In a majority of the variables, the data was non-normally distributed. Regarding distress scales, this was expected, since the sample of the study was non-clinical and since participants were excluded if they had a history of psychiatric problems, resulting in positively skewed distributions, with most participants reporting relatively low values at the scales in comparison to a bell-shaped normal distribution. Non-transformed data was used in the present study, since performed transformations did not correct the issue of non-normal data. There is also some controversy in the field on whether using transformed data is appropriate or whether it can be more damaging to use in statistical analyses than using non-transformed data that violates the assumption that the transformation intends to correct (Field, 2009). Another challenge with the data was that the assumption of homogeneity of variance was not met for some of the variables. This fact, together with the fact of non-normally
distributed data, gave reasons to replace parametric tests of variance and correlation with non-parametric alternatives (ibid.). Non-parametric tests have been accused of having less power to detect statistical effects (type II-error) than parametric tests, but this is only true if data is normally distributed (ibid.). Since in the present study, the data were non-normally distributed in most variables, this was not considered to be a great risk. The power was also ensured with a reasonably large sample size \(N=117\). The assumption of homoscedasticity was not met in all of the regression analyses. This lead to difficulties of generalizing the results on the regression analyses beyond the sample in the present study. This was also the case in the moderation analysis.

Survey studies always give rise to methodological concerns. One is the reliability issue of self-report measures. There are no guarantees that one succeeds in designing a measurement that can capture what is intended. Therefore, choosing instruments that have good psychometric properties was of high importance in the present study. Validity is another concern, since questionnaires always, to some extent, are biased by the authors and the contexts in which the authors live and work. Different cultural contexts might need different forms of measurement when measuring a given phenomenon. This issue is of certain importance in cultural studies, where one must carefully choose proper measurements that are valid across cultures, and question the possible cultural biases that might be involved in the answering of the questionnaire.

Especially, measuring subjective well-being is linked to several difficulties. For example, the level of satisfaction with one’s life in individualistic cultures is to a greater extent determined by the individual’s emotions and moods, and in collectivistic cultures by the individual’s social life (Diener, 2012; Suh, Diener & Updegraff, 2008). Since most well-being measures are designed in individualistic western societies, the meaning of well-being in other cultures may not be properly captured (Uchida & Oghihara, 2012). Also, there may be
technical biases due to culture specific social norms about a condition or circumstance, such as infertility, that may affect the individual’s responses on questions regarding this condition and the individual’s well-being (WHO, 2012; Schimmack, Oishi & Diener, 2005). These issues were considered in the process of choosing instruments measuring well-being and emotions in the present study, and may also have been one of the reasons why the Iranian women reported lower levels of well-being compared to the Swedish women.

**Implications and future research.** Few studies have investigated cultural differences in emotionality in relation to infertility. Results from the present study can provide additional understandings of cultural diversities in the emotional experience of infertility, emphasizing the need for culture specific treatment and placing demands on health care professionals’ understanding of their patients’ cultural background. Further research is needed on this topic, in order to generalize these findings.

The findings of social support as a buffer against distress in the Swedish sample indicates that social support can provide a beneficial effect in a stressful condition such as infertility, and that it therefore should be included in the treatment of infertility. Further research is needed on how to implement social elements in psychological treatment.

Stigmatization due to different cultural norms and beliefs regarding childlessness indicate that infertility also is a social phenomenon, which underlines the need for interventions increasing a cultural and social tolerance against infertility. Developing strategies to increase awareness of infertility in order to decrease infertility related stigmatization, is another topic of importance for future research.

Regardless of culture, the present study indicates that infertility is a stressor resulting in psychological suffering. This finding stresses the importance of psychological interventions as complements to conventional medical treatment of infertility, in order to
minimize infertility related distress and prevent discontinuing of treatment due to treatment induced strain.
References


Miyamoto, U., Uchida, Y. & Ellsworth, P. C. (2010) Culture and mixed emotions: Co-


