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THE ROLE OF DISTANCE AND PROXIMITY IN SOCIAL SUPPORT AND PSYCHOLOGICAL DISTRESS FOR WOMEN WITH INFERTILITY

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THESIS APPROVAL FORM

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ABSTRACT

The Role of Distance and Proximity in Social Support and Psychological Distress for Women with Infertility

Alexandra Chong

About 10% of women aged 15-44 have difficulty getting pregnant or remaining pregnant (CDC, 2011). This study was on how women use their social support to cope with their infertility. The three aims of the present study were: (1) examine online communication versus face-to-face interactions for infertility social support groups, (2) examine online communications versus face-to-face interactions for personal social support network, and (3) examine relationships between the average geographical location of personal social support network and psychological distress outcomes. There were no significant differences between face-to-face interactions and online communication on psychological distress for either infertility social support groups or personal social support groups. A greater average geographical distance of personal social support was significantly correlated with lower levels of emotional distress and less negative coping styles. The findings suggest that the use of online communication for social support when coping with infertility is comparable to face-to-face interactions, if not preferable.

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Introduction

According to the United States Center for Disease Control and Prevention (2010), now approximately 7.3 million women experience infertility. In addition, the number of women aged 35 years old and older who are pregnant has increased from the year 2000 to 2005. Researchers and practitioners argue that conception becomes more difficult with age (Dunson, Baird, & Colombo, 2004; Gnoth, Godehardt, Frank-Hermann, & Freudl, 2003). Women who experience fertility or reproductive issues may also experience feelings of distress, anxiety, and depression. The psychological problems that women with infertility experience are of particular interest because of the increase of communication that has occurred through the internet in recent years (White & Dorman, 2001). Individuals who experience fertility problems are likely to rely on their social support network (Berghuis & Stanton, 2002; Lechner, Bolman, & VanDalen, 2006; Matsubayashi, Hosaka, Shun-ichiro, Suzuki, Kondo, & Makino, 2004; Verhaak, Smeenk, Van Minnen, Kremer, & Kraaimaat, 2005).

The increase of online health support groups in recent years and Western society's strong dependence on the Internet leads to questions about how online support groups compare to in-person support groups. The quality of social support and its degree of effectiveness as a coping mechanism is at question for those individuals who may frequently utilize online support groups.

This paper includes a review of social support for women who experience infertility. Comparisons of online support groups to in-person support groups for infertility, and the examination of how participants communicate with their personal social support members were included. Relationships between the geographical location

of social support members and infertility coping, distress, and perceptions of the illness and support were examined.

The Increase of Infertility: The Changing Role of Women in the Home and Society

The changing roles of women in the household and the changes of family dynamics may have influenced fertility experiences. Women have an increased focus on their career and education goals, gender equity models of the family home are on the rise, and the age to conceive is increasing (Hansen, 1986; McDonald, 2000). Because fertility declines with age, conception of biological children becomes more difficult with age, and risks from pregnancies increase as age increases (Dunson et al., 2004; Gnoth et al., 2003). This change of women's roles in society and the family home is a possible explanation for the increase of infertility.

McDonald (2000) provides a general theoretical explanation for the persistence of low levels of fertility in advanced countries, such as the United States. McDonald (2000) proposes the gender equity model. McDonald (2000) argues that women are increasing their status in the workforce and they are delaying the decision to bear children. This delay allows women to attend to their initial priority: careers and jobs.

Recently, the number of males considered as the "breadwinners", the individual who provides the primary source of income for the home or family, has declined. Currently, modern family dynamics in advanced countries tend to follow the gender equity model, rather than the male breadwinner model (McDonald, 2000). In the gender equity model of family dynamics, both the head male and female of the family equally contribute to the household income. Notably, as McDonald (2000) pointed out, advanced

countries are showing an increase of the female breadwinner model, as young females now tend to be more educated with rising academic and career opportunities.

The changing dynamic of the family home that reflects an increase of women in the workforce who follow a gender equity model may be the reason for an increase of infertility in advanced countries (McDonald, 2000). As women's childbearing years are being replaced by time spent on establishing their careers, the delay or restriction on having children may result in infertility as their age increases.

Infertility and Psychological Distress

Women who experience infertility may suffer from psychological symptoms because of the difficulties and frustrations associated with their condition. Researchers found that women with infertility experience stress, depression, anxiety, and overall emotional distress (Lechner et al., 2006; Matsubayashi et al., 2004). According to McQuillan, Greil, White, and Jacob (2003), women who are faced with fertility issues feel an increase of frustrations at the idea of the inability to conceive. Furthermore, these frustrations are associated with an increase of higher overall psychological distress.

The psychological distress that may result from infertility issues is a challenge that individuals may face. Benyamini, Gefen-Bardarian, Gozlan, Tabiv, Shiloh, and Kokia (2008) found that women facing infertility challenges felt emotionally taxed. Feelings of contempt, stress, depression, and frustration may arise when faced with infertility challenges (Benyamini, Gozlan, & Kokia, 2004; Benyamini et al., 2008; Lechner et al., 2006; McQuillan et al., 2003; Matsubayashi et al., 2004). Researchers have found that unsuccessful attempts of conception and fertility challenges, even with treatment, show an increase of depression and anxiety compared to baseline (Verhaak et

al., 2005). The best mediators of the potential psychological distresses that may arise with the emotional turmoil of infertility are at question.

How women cope with these infertility challenges is of particular interest, because different types of coping styles are correlated with varying levels of emotional and psychological outcomes (Benyamini et al., 2008). Coping involves how individuals respond to stress through their behaviors. The individuals make efforts in an attempt to diminish any harm or discomfort associated with the stress (Carver, 2010; Carver & Scheier, 1989).

Benyamini et al. (2008) identified two steps of a hierarchy in coping with infertility. First, women may cope with the actual problem of infertility, or the emotions that are associated with the problem of infertility. Second, coping may occur through either approach or avoidance. Benyamini et al. (2008) studied 652 Israeli women, and they assessed coping with infertility and their well-being and psychological distress. Benyamini et al. (2008) used The Coping with Infertility Questionnaire, which included various coping strategies and the Infertility Specific Well-being, and Distress Scales to measure for psychological distress. Results showed that women who used an emotional approach and problem appraisal strategies of coping had better psychological adjustment than women who used emotional avoidance and problem management strategies. The approach/appraisal strategy of coping involved accepting the problem, interpreting the challenge of infertility in a positive manner, and positive treatment of oneself. The avoidance/management strategy of coping included denial, inward anger, and planning and information seeking about infertility.

These findings suggest that with a low-control situation, it is better to accept infertility challenges, rather than control them. Problem management strategy subscales in this study included strategies such as seeking information about infertility and seeking social support. Benyamini et al. (2008) found that women who reported higher tendencies of seeking more information on infertility were more likely to have poor levels of psychological adjustment. Benyamini et al. (2008) showed that attitudes on social support were included in the avoidance/approach strategy of coping. However, it is important to note that items in the social support subscale included, "I ask a friend or relative for advice", "I look for assistance from different people" and "I ask people who have had similar experiences what they did". Therefore, the items in this specific subscale indicate that social support was related to informational social support, rather than emotional social support. Thus, seeking social support was categorized with information seeking, and as part of the problem management strategy of coping, rather than the problem appraisal and emotional approach strategy of coping. The results from Benyamini et al. (2008) suggest that a focus on the emotional aspect of the struggle with infertility is more beneficial for psychological well-being, rather than seeking information about infertility and trying to control the condition.

Coping with Infertility: Social Support

Social support is a factor that may be involved with women's coping strategies during their infertility experiences. Cobb (1973; as cited in Leung & Lee, 2004) found that social support networks are associated with a decrease of psychological distress. Social support includes information and support provided for individuals to relay feelings and attitudes of mutual care, emotional concern, affirmation and encouragement. Social

support can be categorized in many different ways. The various dimensions of social support include: 1) emotional support, the expression of positive effect, empathetic understanding, encouragement of expression of feelings; 2) informational support, the offering of advice, information, guidance, or feedback; 3) tangible support, the provision of material aid or assistance; 4) positive social interaction, the availability of other persons to do fun things with you; and 5) affectionate support, the expression of love and affection (Sherbourne & Stewart, 1991). These dimensions of social support were developed from chronically ill patients.

Previous research indicates that social support is associated with psychological well-being during the difficult experiences of infertility (Lechner et al., 2006; Matsubayashi et al., 2004; Verhaak et al., 2005). Spousal support can be a significant moderator of psychological distress (Matsubayashi et al., 2004). Matsubayashi et al. (2004) conducted a cross-sectional study on infertile Japanese women who visited a local fertility clinic. Participants completed a Hospital Anxiety Depression Scale (HADS) and an in-house developed fertility questionnaire. Questionnaire items included, "I feel inferior because I cannot have babies" and "I am satisfied by my husband's support" (Matsubayashi et al., 2004). Results from the study showed that the question categories of "husband support/decisions" were significantly associated with the HADS score, which indicates anxiety and depression about their fertility problem. Stress was also significantly associated with the HADS score. These findings suggest that feelings of stress and lack of husband's support contribute to depression and anxiety for infertile Japanese women. Thus, the findings indicate that spousal support during the experience of infertility is associated with women's psychological well-being.

Lechner et al. (2006) showed that a social support network could benefit the psychological well-being of individuals who experience infertility. In this study, social support and coping style were compared to levels of psychological distress. Coping styles were categorized as either active or passive. Active coping styles included dealing with the problem, seeing the problem as a challenge. Passive coping styles included withdrawing oneself from everyone and feeling discouraged by a situation. Next, four subscales measured social support: daily emotional support, emotional support with problems, appreciation of support, and social companionship. In contrast to the social support subscales used in the Coping with Infertility Questionnaire (Benyamini et al., 2008), only the emotional subscales of social support from the measurement were used (van Sondren, 1993; as cited in Lechner et al., 2006).

Lechner et al. (2006) predicted a positive relationship between passive coping styles and psychological distress, a positive relationship between dissatisfaction of social support and psychological distress, and that the relationship between coping styles and psychological distress is correlated with satisfaction with social support. In support of their predictions, Lechner et al. (2006) found a significantly positive relationship between passive coping skills and psychological distress and dissatisfaction with social support and psychological distress. Furthermore, dissatisfaction with social support and passive coping style was associated with more health complaints. In addition, there was a strong association between people with high levels of dissatisfaction with their social support and passive coping and health complaints. These findings suggest that individuals who are dissatisfied with their social support network are inclined to use the passive coping

approach in dealing with their infertility problem**.** Thus, a passive coping approach could lead to an increase of psychological distress.

However, the literature suggests that coping styles for health problems may not be as strongly related to psychological well-being as social support. In a longitudinal study conducted by Verhaak et al. (2005), social support was a significant moderator of psychological adjustment, whereas coping style was not. Emotional adjustment was measured for women before, during, and after fertility treatments (Verkaak et al., 2005). Questionnaires that measured anxiety, depression, personality characteristics, coping, marital relationship and social support were collected prior to fertility treatments, at the last session of fertility treatment, and 6 months after the final fertility treatment. As predicted, women showed a decline in anxiety and depression if treatment was successful at the time of 6 months, and an increase of anxiety and depression if treatment was unsuccessful at the time of 6 months.

Results from the study showed that coping styles were not significantly associated with depression and anxiety. However, social support was a significant variable in psychological distress. General marriage dissatisfaction, a subscale of social support, was significantly positively correlated with anxiety and depression. In addition, results suggested that spousal social support was an important source of support, similar to the findings from Matsubayashi et al. (2004). Perceived social support showed a stronger negative correlation with anxiety and depression. Thus, higher and more positive perceptions of social support were associated with lower levels of anxiety and depression for women with unsuccessful fertility treatments (Verhaak et al., 2005). Furthermore, the

perception and satisfaction of social support is highly correlated with levels of psychological distress.

Contrary to previous studies (Benyamini et al., 2008; Lechner et al., 2006), Verhaak et al. (2005) found that coping styles of emotional approach, problem management, and cognitive avoidance showed no significant associations with anxiety and depression. Verhaak et al. (2005) suggest that the lack of significant findings may be because of the lack of control to change the problem of infertility. Verhaak et al. (2005) mention that the stressors of infertility are variable and uncontrollable. All participants in the study were technically using an active/problem management style of coping in the first place by seeking fertility treatment; consequently, coping style was insignificant. Verhaak's et al. (2005) findings concluded that social support is a significant buffer in the relationship between the stressor of unsuccessful fertility treatment and psychological distress.

As the research suggests, an active, emotional approach of coping styles (Benyamini et al. 2006; Lechner et al. 2006) in dealing with the problem of fertility and fertility challenges can be a moderator of psychological distress. However, social support for the purposes of seeking emotional support, rather than informational support was shown to be the best way to reduce psychological distress (Lechner et al., 2006; Matsubayashi et al., 2004; Verhaak, et al. 2005). Social support for women who face infertility is an important method of coping. Social support can involve comfort for emotional problems, and research has shown that infertility is associated with emotional distress such as depression and anxiety (Benyamini et al., 2008; Lechner et al., 2006; Matsubayashi et al., 2005; McQuillian et al., 2003;). However, for women who

experience infertility and actively seek social support, what modes of communication are used in order to gain this support? Most importantly, which method of receiving social support is the most effective in moderating the psychological distress that is associated with infertility? Prior research on social support lack important questions about social support for women with infertility.

Social Support for Infertility: Online or In-person?

The changing dynamics of women's role in society and family may be a reason for the increase of infertility in advanced countries, such as the United States. This change in dynamics in the workforce, home, and society could also be a reason for the increased use of technology, more specifically, the Internet. These women are faced with the difficult challenges of balancing and prioritizing their homes and careers. Women who actively attempt to balance both their homes and careers whilst they experience fertility problems may find it difficult to commit additional time to cope with their infertility. These women may look for easy ways to help themselves cope with their infertility. One such choice is online groups (Davison, Pennebaker, & Dickerson, 2000).

Online support groups are gaining popularity. Online support groups for health topics are especially on the rise. Benefits of online support groups include cost effectiveness, time effectiveness, decline of geographic and transportation barriers, privacy and anonymity (Davison et al., 2000; White & Dorman, 2001). Research on various online health problem support groups indicate that the Internet is now being used as an easy way to gain health information. There is a significant increase of individuals with health problems using the Internet as a source of information (Cline & Haynes, 2001). Of those individuals who use the Internet to seek information about their health

problems, one in four join online support groups (Cline & Haynes, 2001). Coulson, Buchanan, and Aubeeluck (2007) found that for online support groups of Huntington's Disease, a large majority of the support that was offered was informational support. Previously, Coulson (2005) found that for support groups for individuals suffering from Irritable Bowel Syndrome, the main purpose of the support group was to offer informational support. As Cline and Haynes (2001) point out, a major benefit of online support groups is to obtain information about health issues from others with the same experiences, rather than having to pay to see professionals for potentially the same information.

Another benefit to online support groups is time effectiveness. As discussed previously, a potential reason for the increase of infertility is that women are more focused on their careers and education. For these women, online support groups may be more appealing to obtain the support that they seek than in-person support groups because of time constraints. For instance, it may be easier for women to participate in an online support group from their home or work for any desired time, rather than having to drive a distance and commit an allocated amount of their time to in-person support groups (White & Dorman, 2001). Additionally, transportation is not a problem for online support groups. Individuals without access to transportation have the option of participating in the online support groups (Epstein, Rosenberg, Venet Grant, & Hemenway, 2002; White & Dorman, 2001). Therefore, online support groups may be particularly attractive to individuals of lower socio-economic status who may not have flexible means of transportation (Epstein et al., 2002).

Finally, online support groups may be appealing to those individuals who are embarrassed or uncomfortable talking about their health problems to another person in the physical realm. Braithwaite et al., (1999) studied online support groups for individuals with physical disabilities. As Braithwaite et al. (1999) notes, online support groups are appealing for individuals with physical disabilities, because the disabilities are not "seen" online as they may be in face-to-face support groups. Braithwaite et al. (1999) also mentions that online support groups are beneficial for individuals with physical disabilities, because able-bodied individuals may feel uncomfortable interacting with those who have physical disabilities. However, this benefit, particularly for individuals with physical disabilities is questionable because one would assume that even in an in-person support group for individuals with physically disabilities, such a discomfort is unlikely to exist.

Although there are benefits to online support groups, face-to-face, or in-person support groups may have more advantages (Davison et al., 2000; Epstein et al., 2002). Despite the easy access to health information in a cost and time, effective manner through online support groups, the quality and accuracy of the information is questionable (Cline & Haynes, 2001; Davison et al., 2000). Coulson (2005) and Coulson et al., (2007) found that online support groups for health topics focused on dimensions of informational support. Notably, many of these online support groups are utilized and even moderated by the actual individuals participating in the group, rather than medical professionals. Individuals who seek social support through in-person support groups may have the advantage of access to a medical professional (Davison et al., 2000). As White and Dorman (2001) point out, most online support groups have no formal administrative

structures. Furthermore, without knowing the true identities of individuals who participate through online support groups, the quality of the social support is questionable.

Even if the information that is shared in online support groups is accurate, disadvantages of seeking health information online and in online support groups exist. As previously discussed, Benyamini et al. (2008) found that women with infertility who use a problem management, information seeking style of coping had higher levels of distress than those women with infertility who used a problem appraisal (acceptance of the problem) and emotional approach coping style. The popularity of seeking health information online (Cline & Haynes, 2001) and evidence that informational social support is a dominant dimension of social support found in online support groups (Coulson, 2005; Coulson et al., 2007), is a concern. Women with infertility issues, who may utilize online support groups as a way to cope with their illness, may receive and encounter more informational social support than emotional social support.

Additionally, online support groups lack the nonverbal communication of in-person support groups, which can significantly affect the tone of the support group. Galinsky, Schopler, and Abell (1997) offer similar comparisons to those mentioned previously about online or non face-to-face support groups (i.e., telephone) versus in-person face-to-face support groups. Galinsky et al. (1997) provide interesting insight on the disadvantages of technology-based support groups through their findings. Galinsky et al. (1997) further investigated the rising popularity of the use of technology in mental health. Data were collected from surveys administered to group therapy practitioners. Information from the surveys revealed participants' experience with telephone and

computer groups, their knowledge and comfort levels with these groups, and their personal perspectives of the use of technology for group therapy.

Results from the survey were consistent with previous research, because online support groups had benefits, such as anonymity, elimination of geographical and transportation barriers, convenience, and ability to reach out to a wider range of individuals as previous research on online support groups (Davison et al., 2000; White & Dorman, 2001; Cline & Haynes, 2001).

However, there were notable disadvantages for the use of technology compared to in-person group support settings in the Galinksy et al. (1997) study. The most significant disadvantage listed by a majority of the participants of group practitioners was the inability to detect nonverbal cues and behavior with the use of technology, such as communication via the Internet or telephone for group support. Throughout the survey, participants mentioned 185 times that the inability to detect nonverbal cues and behaviors during support group sessions was extremely problematic (Galinsky et al., 1997). Participants emphasized that important information can not only be misinterpreted, but also lost all together during technology-based support sessions that utilize online or telephone communication. This can occur because individuals are unable to detect, hear, see, or gain a sense of other individuals' emotions and feelings. Participants who listed the disadvantages of online and telephone conducted group therapy sometimes described online or telephone support groups as, "impersonal, dehumanizing, and isolating" (Galinsky et al., 1997, p.181). Other responses included a loss of intimacy, loss of interpersonal connections, and interference with mutual aid and support.

Galinsky et al.'s (1997) study led to interesting insight on some of the disadvantages of such groups. The loss of nonverbal behavior and cues that are present in in-person support groups can hinder the support individuals seek. Galinsky et al.'s (1997) findings on disadvantages of technology-based support groups are consistent with other research findings on the importance of nonverbal behavior and communication, especially in the realm of manual modality forms of communication, such as sign language. Research on American Sign Language and communication reveal that nonverbal behaviors are indicative of emotions and feelings over verbal communication (Goldin-Meadow, McNeill & Singleton, 1996). American Sign Language is a form of communication that depends heavily on nonverbal behaviors and cues to relay the full message intended (Goldin-Meadow et al., 1996). If non-verbal behavior is such a strong indicator of emotions and feelings as Goldwin-Meadow et al. (1996) and Galinsky et al. (1997) suggest, then the quality of emotional support one can receive through the telephone or internet is questionable.

Non face-to-face support groups can hinder the ability to detect nonverbal behaviors, especially during online communication where tone and inflection of voice is limited, in opposition to the use of telephone. These findings on the importance of nonverbal behaviors as a tool to gather and expel information on emotions and feelings suggest that online social support has limitations for women who seek support in reference to their infertility. Notably, this limitation is further exacerbated by the findings of Benyamini et al. (2008) because an emotional approach coping style of infertility was a significant moderator of psychological distress. If the emotional social

support needs are hindered by a lack of nonverbal cues, then online support groups have limitations for women with infertility.

Another advantage of in-person support groups is that face-to-face interactions are associated with higher quality of life. Leung and Lee (2004) found that higher levels of quality of life were positively associated with frequent face-to-face interactions and in-person support groups. Leung and Lee's (2004) study measured Chinese participants' activities online and in the real world and its relationship to perceptions of social support and quality of life.

Both internet activities and face-to-face activities were significantly correlated with social support and quality of life as predicted. However, individuals who had frequent face-to-face interactions, such as talking with friends and family face-to-face and engaging in community activities had higher correlations with positive perceptions of social support and quality of life in comparison to individuals with frequent internet activities.. The findings of the Leung and Lee (2004) study suggest that traditional, face-to-face, in person support groups could be more beneficial to women with infertility than online or non face-to-face support groups because frequency of face-to-face interactions showed stronger correlations and significance to social support satisfaction and perception than internet interactions.

Finally, Epstein et al. (2002) provided comparisons of women whose only source of information and support for their infertility is the internet (OO) to women who have alternative forms and sources of information and support (AO). The study indicated that despite the cost effectiveness and elimination of geographical and transportation barriers

that are listed as advantages of online support groups, for women with fertility challenges, utilization of solely online support groups is a disadvantage.

Epstein et al. (2002) collected information from respondents of their survey advertised in an online infertility organization website. Surveys included measurements of self-assessed ability to cope with infertility, perceived stress, perceived support from relatives and friends, and depression. Participants in the study were categorized into either two groups: the OO group, participants who identified that the internet was their only source of information and support on infertility, and the AO group, participants who had alternative sources, other than the internet for information and support on infertility. Classifications of the groups were determined by the statement, "Internet is my only outlet for talking about infertility" based on confirming (OO group) or denying (AO group) this statement. Of the demographics information collected, lower socioeconomic status and less formal education were associated with the OO group in comparison to the AO group.

Results from Epstein et al. (2002) indicated that participants in the OO group had significantly more emotional difficulties with their fertility challenges than participants in the AO group. According to Epstein et al. (2002), participants in the OO group reported higher scores of depression, considered infertility as more stressful, increased levels of worry, had less satisfaction with important relationships, and more negative perceptions of received social support in comparison to the AO group.

Epstein et al. (2002) concluded from their research findings that women who solely rely on the Internet as the main source of information and support for their infertility issues tend to be of lower socioeconomic status, are less formally educated,

report higher levels of psychological distress and are less satisfied with their social support network. These findings indicate contradictions for many of the benefits of online support groups for health conditions as suggested by previous research (White & Dorman, 2001; Davison et al., 2000; Cline & Haynes, 2001). For instance, previous research suggests that an advantage is cost effectiveness (White & Dorman, 2001; Davison et al., 2000; Cline & Haynes, 2001). However, Epstein's findings for women who solely use the Internet as their primary source of information and support for their infertility showed that they tended to be less wealthy and formally educated. Therefore, the cost effectiveness of online support groups may actually be a disadvantage for women with infertility. If these women are less inclined to have access to alternative sources of information and support for monetary reasons (transportation to travel to support groups, visits to fertility clinics, professional opinions), then they are receiving lower quality levels of both informational and emotional support.

Furthermore, another advantage of online support groups discussed in previous literature was convenience and time effectiveness. Online support groups may be appealing for busy individuals who do not have the time to travel to in-person support groups and commit the allocated time to attend meetings and sessions. However, Epstein et al. (2002) found that a majority of participants in the OO group identified their occupations as homemakers. Earlier, it was suggested that women with infertility may be more attracted to online support groups based on the gender equity model of the family home as proposed by McDonald (2000). Women are increasingly considering their career and educational goals as a priority over starting a family. Thus, as age increases for these women, fertility difficulties increase as well (Gnoth et al., 2003; Dunson et al.,

2004). On the other hand, if these older women with well-established careers and educational background seek informational and emotional support for their infertility, then online support groups may be more appealing. However, Epstein et al. (2002) found that participants in the AO group tended to have higher educational backgrounds than participants in the OO group. Epstein's et al. (2002) findings suggest that while online support groups may be appealing to those with limited time and resources, women who have well established career and higher education may benefit from alternative support sources other than the Internet.

Online support groups may be disadvantageous for women with infertility despite previous research that claim benefits of cost and time effectiveness (White & Dorman, 2001; Davison et al., 2000; Cline & Haynes, 2001). The advantages of cost and time effectiveness of online support groups, especially support groups for women with infertility are questionable based on the findings by Epstein et al. (2002). The OO group took advantage of infertility online support groups because of cost and time benefits. However, results from the study found that the OO group reported higher levels of psychological distress, including depression and poor coping skills. These findings indicate perhaps the time constraints of committing to face-to-face support groups are not limited by well-established careers and education, but socioeconomic status. Therefore, perhaps income is a limitation in seeking alternative sources of support other than the internet (Epstein et al., 2002).

Despite both the advantages and disadvantages of both online support groups and in-person support groups (Cline & Haynes, 2001; Davison et al, 2000; Leung & Lee, 2004; White & Dorman, 2001), the research findings from Epstein et al. (2002) showed

strong evidence for women with infertility to avoid a primarily internet-dependent source of information and social support in relation to their condition.

Proximal and Distal Social Support

Extensive literature has supported in-person support groups rather than online support groups for women when coping with infertility. However, women with infertility who decide to seek support through a special population group who share similar conditions are essentially seeking an illness specific social support group. It is likely that for these illness specific social support groups, initial interactions with individuals from these groups, whether online or in-person, are based solely on their shared condition of infertility. Later, more intimate relationships may be formed, but initially the binding link of support group members is the shared medical condition.

Notably, it is likely that women with infertility have a social support network consisting of personal relationships separate from their participation in support groups, regardless if it is online or in-person. Their personal social support network may include spouses, friends, and family members. A major limitation in many of the studies on infertility and social support groups is that the communication dimensions of social support networks (spouses, family, friends, and neighbors) have not been studied. If the communication forms of social support groups that target infertility have been so closely studied (online versus in-person), then the same observations should be studied for alternative forms of social support networks (spouses, family, friends, neighbors).

There may be differences in the modes of communication social support is received from personal support groups of intimate partners, friends, and family members. How social support is received in terms of communication can be described as proximal

and distal social support. Proximal and distal social support refers to geographical distance and modes of communication. Therefore, proximal social support can be classified as a social support network that is located geographically close to one's own location and communication consists mainly of face-to-face contact. Proximal social support is comparable to in-person support groups. Conversely, distal social support can be classified as a social support network that is geographically further away and communication consists of the use of modern technology, such as the internet and telephone.

The concept of proximal and distal social support is not prevalent in the existing literature, least of all in the research on infertility and social support. However, a number of studies have researched associations of geographical distance, forms of communication of social support, quality and satisfaction of social support, and psychological well-being (Copeland & Norell, 2002; Mok, Wellman, & Basu, 2007).

The evolution of technology in the past decade has allowed the ability to communicate with one another to be of extreme ease and comfort. Communicating, or at least talking to one another is easier than ever with cell phones and especially the internet with email, chatting, and social networking sites. Arguably, people can feel close, without actually having to be physically close to each other.

Mok et al. (2007) explore the impact of distance and communication on social support without the internet. The findings of their study provide comparisons of communication using data that were collected in the 1970's and the present. Previous literature suggests that geographical distance is an insignificant variable in communication because of the availability of mobile telephones and internet (Cairncross,

1997; Hepworth, 1991; Thrift & Leyshon, 1988). Despite this, Mok et al. (2007) hypothesized that although distance may not affect the ability to communicate, distance may affect the motivation and frequency to communicate, thus further influencing social support.

The results from Mok et al. (2007) concluded that distance is a significant variable in the frequency and motivation for contact and social support. Even with the availability of the advances in communication technology, which were not present in the 1970's, the results collected from this study sample indicates that telephone contact decreases as the geographical distance of support increases, specifically by more than 100 miles (Mok et al., 2007). Although one of the benefits of the telephone is that communication is possible despite distance barriers, this study found that the amount of telephone communication occurrence decreased as the distance increased. Thus, perhaps the motivation to initiate communication decreases as the geographical distance of social support increases. When observing social support, Mok et al. (2007) found that the probability of providing emotional support is about 0.24 within 20 miles. This probability increases slightly to 0.27 when the distance is decreased to within 5 miles. Therefore, emotional support is more likely to occur the closer the distance between the recipient and provider of social support. These findings support the idea that geographical distance is a significant variable in social support.

Mok et al. (2007) found that the relationship between geographical distance and social support goes beyond the type of support. They classified the variables of communication by face-to-face contact or non face-to-face contact (telephone or internet). This study specifically observed the importance of the methods of

communication that are associated with the repercussions of distance. Mok et al. (2007) studied modes of communication, such as the internet and telephone, which can be utilized despite geographical distance. The feasibility of communication is no longer impacted by distance, yet even with the availability of technological advances, distance is still a significant factor in contact and social support. This study supports the suggestion that the concept of proximal and distal social support should take into consideration the resources used to communicate (telephone, internet). More importantly, the results from the study conducted by Mok et al., (2007) indicate that proximal social support may be favorable for women with infertility because a decrease of geographical distance between recipients and providers of social support is associated with an increase of emotional support.

The role of geographical location of social support is an important factor in adjustment to a new transition. Copeland and Norell (2002) researched social support networks during an international transition. Participants in this study were women who had to temporarily move to another country because of their spouses' jobs. Copeland and Norell (2002) studied how a move from one country to another will affect the social support network of women. They hypothesized that higher levels of adjustment would be found in women who were highly satisfied by their social support network, and whose social support networks were located both in the current country they were residing and their home country.

Participants were assessed on their measures of social support and adjustment. Social support was categorized by function (type of social support, such as emotional or financial, and source (who was identified as a part of the social support network),

communication (local phone calls, face-to-face interactions vs. long distance phone calls, emails, letters by mail), and satisfaction (how satisfied they were by their social support).

The results of the surveys held strong support for Copeland and Norell's (2002) hypothesis. Social support in the domain of private feelings and positive feedback had a strong relationship with adjustment level. Participants who reported feeling the need for more social support to discuss private feelings and receive positive feedback had lower levels of adjustment. Notably, a significant finding from the results was that participants who identified their social support network as local, rather than long-distance were found to have better adjustment to the transitioning of moving to a new country. Although participants had easy access to their social support network through the use of technology, it was social support received in a face-to-face manner that was strongly associated with higher levels of adjustment. Local social support can be compared to proximal social support as it is support that is received by face-to-face contact and from individuals located in close geographical range. Long-distance social support refers to communication through email, letters, and long-distance phone calls with individuals from the participants' home country (Copeland & Norell, 2002).

Although Copeland and Norell's (2002) predictions for better adjustment were that social support would come from both the participants' home country and current country of residence, the findings indicate that social support found in the current country of residence is the strongest. Copeland and Norell (2002) advise against long-distance social support as a primary resource for adjustment and coping with the transition. Similar to Mok et al. (2007), the geographical distance of social support networks for these participants is not a barrier in terms of communication with existence of email, the

internet, and telephone. Using these resources to sustain social support networks from participants' home countries is feasible, yet the results of the study emphasize the importance of face-to-face contact and proximity during a difficult transition.

Although Copeland and Norell (2002) used participants who experienced an international move for their findings on proximal and distal support, their results are applicable as a strong basis for the present study. Infertility is a difficult and significant life event, similar to an international move. There may be shared feelings of loneliness and isolation (Copeland & Norell, 2002; McQuillian et al., 2003; Verhaak et al., 2005). In the Copeland and Norell (2002) study, the international move was an experience shared with the spouse. Spousal interaction occurs frequently in the experience of infertility and is found to be a significant coping mechanism. (Matsubayashi et al., 2005; Lechner et al., 2006). These comparisons suggest that proximal social support may be more beneficial than distal support for women with infertility as well.

The Present Study

The purpose of the present study was to examine the psychological distresses of women with infertility and their social support. The present study had three aims including: 1) to examine the influence of in-person support groups for infertility on emotional distress and coping styles in comparison to online support groups, 2) to compare proximal and distal social support on emotional distress and coping styles for women with infertility, and 3) to examine any relationships between the average geographical distance of personal social support, coping strategies, and psychological outcomes of infertility such as depression, stress, and anxiety.

Hypothesis

The present study included assessments of how participants obtain support to cope with their infertility, how participants communicate with their personal social support network, and if the geographical distance of their personal social support influenced their psychological outcomes of coping with infertility. The present study was on how participants received social support regarding their infertility (in-person social support group attendance versus online social support group) and how they received social support from their personal relationships (proximal versus distal). In-person support group attendance indicates that participants have a face-to-face method of receiving social support from others who share their experiences of infertility, rather than solely online support. Proximal grouping indicates participants communicate with their personal relationship in a face-to-face manner a majority of the time, in comparison to distal, when online communication is dominant.

Based on prior research, it was hypothesized that participants who attend in-person support groups for their infertility would have lower levels of emotional distress and more positive coping strategies in comparison to participants who do not attend in-person support groups. Similarly, it was predicted that participants in the proximal group would have lower levels of emotional distress and a higher tendency of positive coping strategies compared to the distal group. These predictions indicate that participants who engage in face-to-face interactions for their infertility and personal relationships would have better psychological outcomes. Therefore, it was predicted that as the average geographical distance of personal social support network increased, emotional distress

and tendencies for negative coping styles would increase, because the feasibility for face-to-face interactions would become more difficult.

Method

Participants

The present sample consisted of 62 women recruited through a series of recruitment through infertility organizations, clinics, and websites. Participating infertility organizations and clinics posted advertisements for the present study through e-mail messages, newsletter articles, blogs, website announcements, and in-person announcements during social support group sessions. Advertisements included a direct web-link to the surveying website. A majority of the participants were Caucasian, did not currently have any children, and were married (see Table 1 for complete participant characteristics).

Participants were grouped into their prospective categories of how they received their infertility social support based on whether or not they ever attend in-person support groups, similar to the method of Epstein et al. (2002). The in-person attendance group consisted of 35 participants (56.5%), and the online group consisted of 27 participants (43.5%). Groupings for proximal or distal social support included the listing of exactly three individuals who they consider to be a part of their social support network, and identifying if participants typically communicate with these individuals face-to-face or non face-to-face, such as emailing, chatting, or telephone calls. The major form of type of communication of the three individuals determined proximal and distal groupings. For instance, if a participant identified communicating online for two out of the three

individuals listed, then she was grouped as proximal. There were 37 participants in the distal group (59.7%) and 25 participants in the proximal group (40.3%).

Calculations for the average number of miles between the participants' own location and the location of their personal social support members occurred with the direction website, www.mapquest.com to test for any significant associations with infertility distress, coping, perceptions of illness, and social support scales.

Measurements

All participants in the study completed the full questionnaire survey included in the surveying website. Questionnaires included items on coping with their infertility, their emotional distress, their perception of their condition, their perception of the social support they receive, and psychological distress, such as depression and anxiety. The Communication Social Support Questionnaire (CSSQ) determined participants' group categorization for infertility social support and personal social support as well as participants' attitudes and feelings about the concept of proximal and distal social support. The Coping with Infertility Questionnaire (CIQ; Benyamini et al., 2008), the Infertility Specific Well-Being and Distress Scale (Benyamini et al., 2008; revised from Stanton, 1991), the Illness Perception Questionnaire, modified for infertility (Moss-Morris, Weinmen, Petrie, Horne, Cameron, & Buick, 2002), the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), the Beck Depression Inventory – II (BDI-II; Beck et al., 1996), and the Perceived Stress Scale (PSS; Cohen & Williamson, 1998) were included in the questionnaire.

Coping with Infertility Questionnaire (CIQ; Benyamini et al., 2008)

Benyamini et al. (2008) developed the CIQ to measure dimensions of coping strategies for women with infertility. The measure was developed initially through open-ended interviews with nine women undergoing treatment. The CIQ consisted of fourteen subscales. Subscales included: social withdrawal (α = .80, all reliabilities reported are for the present sample), denial (α = .89), self-blame (α = .79), self-neglect (α = .77), disclosure (α = .87), acceptance (α = .91), positive re-interpretation (α = .85), recruiting spouse support (α = .88), compensation (α = .81), investing in myself (α = .69), seeking social support (α = .74), planning and information-seeking (α = .89), spiritual coping (α = .90), and hope (α = .76). Benyamini et al. (2008) reported three main branches that emerged from the subscales: approach/appraisal, avoidance/management, and spousal support. These three branches were used in the analysis to measure coping styles. The approach/appraisal strategy of coping included items for acceptance, positive re-interpretation, compensation, investing in myself, spiritual coping, and hope. The avoidance/management strategy of coping included, social withdrawal, denial, self-blame, self-neglect, disclosure, seeking social support, and planning and information seeking. Benyamini et al. (2008) reported internal reliability and test-retest reliability as acceptable or higher for most subscales. Each subscale includes related statements using a 5-point frequency scale for responses, ranging from 0 = never to 4 = all the time.

The Infertility Specific Well-Being and Distress Scale (Benyamini et al., 2008)

The Infertility Specific Well-Being and Distress Scale was modified from Stanton (1991) in the study conducted by Benyamini et al. (2008). The modified version of this instrument was used for the present study. This scale is used to measure emotional

adjustment for women with infertility. The Infertility Specific Well-Being and Distress Scale is divided into two subscales: Emotional Well-Being (α = .91) and Emotional Distress (α = .87). There are 10 items of emotions to each subscale, with a 1 to 5 response scale ("not at all" to "exactly how I have felt". Women are asked to describe how recently they have felt each emotion recently.

The Illness Perception Questionnaire – Revised (IPQ-R; Moss-Morris et al., 2002)

The IPQ-R was modified for infertility for the purposes of the present study. The IPQ-R is a widely used measurement in health psychology. The IPQ-R can be modified to target specific illnesses, thus all items in the current IPQ-R were modified for infertility. Subscales for the general attitudes on illness include: Timeline acute/chronic (α = .89), consequences (α =.69), personal control (α = .83), treatment control (α = .69), illness coherence (α = .90), timeline cyclical (α = .81) and emotional representations (α = .82). High scores on the timeline, consequences, cyclical dimensions subscales grouped together as "negative chronic" (α = .80) indicated chronicity of the condition and negative consequences of the illness. High scores on the personal control, treatment control, and coherence subscales grouped together as "positive control" (α = .80) indicated positive beliefs about the controllability of the illness.

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988)

The MSPSS is a widely used instrument to measure individuals' perception of their social support network. This instrument is 12-item scale that that assesses the availability of social support from friends and family. Responses to the items range from 1 = "Very Strongly Disagree" to 7 = "Very Strongly Agree". Items in this scale were divided into three subscales of potential sources of social support: friends (α = .79),

family (α = .90), and significant other (α = .92). In the development of the MSPSS, Zimet et al. (1988) report good internal reliability, with a coefficient of .88 for the entire scale and good test-retest reliability with a coefficient of .85, along with moderate construct validity. Cronbach's alpha for the present study indicated good internal reliability for the entire scale, α = .86.

Perceived Stress Scale (PSS; Cohen & Williamson, 1988)

The PSS assessed participants' perceptions of their levels of stress. This instrument is a questionnaire that measures participants' levels of stress that they have experienced in the past month. The 10-item version of the scale was used for the present study. Responses to the items range from 0 = "Never to 4 = "Very Often". Cohen and Williamson (1988) report good internal reliability (α = .78). Cronbach's alpha for the present study indicated good internal reliability for the entire scale, α = .90.

The Beck Depression Inventory Scale – II (BDI – II; Beck et al., 1996)

The BDI – II is a commonly used scale to measure depressive symptoms. This scale consists of 21 items that are related to the cognitive, social, and behavioral aspects of depression. The higher the score of the collective items indicates increased and intensified depressive symptoms. According to Beck et al. (1996), the development of the BDI-II resulted in strong internal validity with (α = .92) and strong construct validity. Cronbach's alpha for the present study indicated good reliability, α = .90.

The Communication Social Support Questionnaire (CSSQ; see Appendix)

The CSSQ was developed for the present study to identify participants' groupings for infertility social support network and personal social support network. The CSSQ consists of four parts. The first part functions to determine Infertility Social Support.

Participants indicated whether or not they use the internet and its frequency as well as if they attend in-person support groups and how frequently. All participants (n = 62) identified as using the internet as a source of social support for infertility and 56.5% (n = 35) reported they attend in-person support groups. Therefore, groupings for infertility social support were determined simply by whether or not participants attended in-person support groups to examine the influence of face-to-face interactions with others who share their experiences of infertility.

The second part of the questionnaire collected individual information on participants' personal social support network. Instructions for the second part of the measurement were as follows: "Please identify three people in your life who are NOT part of your infertility support network, and who you consider to be a part of your social support network. You must list three and only three individuals. Identify the individuals by their initials, using their first and last name on the first blank space. The order of the listed individuals was not relevant." For each individual listed, participants disclosed their relationship to the individual, the location (city and state) of the individual, and their satisfaction of the support that they receive from the individual. Satisfaction ratings have three responses: 1 = "dissatisfied", 2 = "neutral", 3 = "satisfied". Mean scores of satisfaction of all three individuals listed determined an overall rating of satisfaction.

The third section of the questionnaire categorized participants for proximal and distal groupings. For each individual listed previously in the second part of the measurement, participants identified how they typically communicate with their social support network on a regular 7-day week. Responses were as follows:

1. Face-to-face contact: Visits are physically made. You see the individual in person.

2. Non face-to-face contact: Telephone calls, e-mails, chatting. You do NOT see the individual in person.

The major selection of communication type determined grouping for personal social support. Therefore, if an individual selected face-to-face contact for 2 out of the 3 individuals she listed as her personal social support network, then she was grouped as proximal social support. To further exemplify the classifications, if the same individual indicated in the Infertility Social Support grouping that she receives most of her support and information online and does not attend any in-person social support groups, then she was grouped as distal social support.

Finally, participants answered a brief, 6-item questionnaire to measure their personal attitudes and feelings about proximal and distal social support. The first three items affirm preferences for proximal social support with items such as, "I can tell a lot about someone's feelings or emotions by their facial expressions or body language". The next three items affirm preferences for distal social support with items such as, "I do not find it necessary to see someone in person to discuss serious issues". Responses for the proximal subscale of the questionnaire range from 1 = "I definitely disagree" to 5 = "I definitely agree". Responses for the subscale proximal were reverse scored. Higher scores indicate preference for distal support, whereas lower scores indicate preference for proximal support. Cronbach's alpha indicated poor reliability for the overall scale, α = .39.

Results

Descriptive statistics are presented in Table 2 for the distal preference subscale (CSSQ), the approach/appraisal subscale, the avoidance/management subscale, the

spousal support subscale, the distress and well-being subscales, the positive control, negative chronic, and emotional representation of the IPQ-R subscale, the MSPSS, the PSS, and the BDI.

Pearson correlations were performed on all dependent study variables, the average satisfaction rating and average distance of location of personal social support. Average satisfaction rating was significantly correlated with the emotional distress subscales, the positive control subscale of the IPQ-R, and stress. Older participants reported a greater geographical distance from their personal social support network than younger participants. Participants who used an approach/appraisal strategy of coping had lower scores on the emotional distress subscales, emotional representation subscale of the IPQ-R, depression, and higher perceptions of perceived social support. Participants who used an avoidance/management strategy of coping had higher scores on the emotional distress subscales, emotional representation subscale and negative chronic subscale of the IPQ-R, stress, and depression (see Table 3 for a complete correlation table).

Type of social support and distress

A 2 (in-person vs. online) x 2 (proximal vs. distal) MANCOVA was used to test for differences of emotional distress, coping styles, illness perception, and social support perception between groups. Average satisfaction rating was included as a covariate. Results did not support the prediction that participants who attend in-person support groups for their infertility would have lower scores of emotional distress subscales, stress, and depression compared to participants who do not attend in-person support groups. A between-subjects MANCOVA was performed to analyze the outcome measures (Approach/Appraisal style of coping, Avoidance/Management style of coping, Spousal

Support, Infertility well-being and distress, positive control perception of illness and negative chronic perception of illness, perceived social support, perceived stress, and depression) with whether or not participants attended infertility support group session in-person or online. The analysis did not indicate any significant differences of outcome measures between groups of participants who attend in-person infertility social support groups and participants who do not. The overall model for in-person social support was not significant, Wilks' Lambda = .833, F (12, 43) = .720, $p > 0.05$, effect size = .167, observed power = .345. No interactions were found.

The MANCOVA on the same outcome measures of infertility coping styles, infertility distress and well-being, illness perception, social support perception, stress, and depression also did not support the prediction that participants in the proximal group would have higher scores compared to the distal group on the distress subscales, emotional representation subscale, stress scale, and depression scale, Wilks' Lambda = .849, F (12, 43) = .638, $p > 0.05$, effect size = .151, observed power = .304. No interactions were found.

There were no significant differences between groups for the 2 (in-person vs. online) x 2 (proximal vs. distal) MANCOVA on emotional distress, coping, illness perception, or social support scales. However, descriptive statistics indicated trends towards higher mean differences of distress scales for the proximal group than the distal group and higher mean differences of distress scales for the in-person group than the online group (see Table 2).

Average satisfaction rating was included as a covariate to control for varying satisfaction ratings with personal social support. Pearson correlation revealed that

average satisfaction rating was significantly correlated with well-being, r (59) = .368, p < 0.01, and distress, r (59) = .300, p < 0.05, positive control subscale, r (59) =.-.304, p < 0.05, and stress, r (59) = .267, p < 0.05. A MANOVA was run on all of the outcome measures to test for any significant differences between groups for marital status and education level. No significant results were found, thus they remained excluded as covariates in the MANCOVA.

The MANCOVA on infertility coping styles, infertility distress and well-being, illness perception, social support perceptions, stress, and depression indicated that the covariate variable, average satisfaction rating, did not significantly affect the overall model. However, the test of between subjects effects further indicated that satisfaction with social support was significantly correlated with the infertility well-being subscale F (1,54) = 8.701, p > 0.05, effect size = .088, observed power = .826, the infertility distress subscale, F(1,54) = 5.232, p > 0.05, effect size = .139, observed power = .613, and the positive control subscale, F(1,54) = 5.271, p < 0.05, effect size = .089, observed power = .616. The variables with the highest observed power were found to be significantly related to satisfaction (see Table 4).

To reduce the number of outcome measures in an attempt to seek further significant findings, a Principal Components Factor Analysis extracted seven factors from the original total outcomes of infertility coping styles, infertility distress and well-being, illness perception, social support perceptions, stress, and depression (see Table 5). The PCA accounted for 87% of the total variance. The seven factors extracted from the PCA were “negative coping strategies and distresses”, “emotional distresses”,

"controllability of infertility", "distal preference", "spousal support", "positive coping strategy", and "perception of social support".

A MANCOVA for the infertility in-person support grouping variables and personal social support grouping variables was run to examine if there were any significant differences between infertility in-person support group attendance and online infertility support group attendance as well as proximal and distal groups. Results did not support the predictions that the infertility in-person support group or proximal group would have higher factor loadings for the positive coping distress factor, the spousal support factor, or the perception of social support factor. The MANCOVA using the seven extracted factors as outcomes indicated that satisfaction with personal social support is significantly associated with the factor, "emotional distress", F (1,54) = 4.787, $p > 0.05$, effect size = .081, observed power = .483. No interactions were found.

Geographical distance and distress

It was predicted that as geographical location of personal social support increased, scores for emotional distress subscales for infertility, emotional representation subscale for IPQ –R, stress, and depression would increase. Results did not support these predictions. Bivariate correlations were performed on the relation among average number of miles from participants' own location to the location of their social support network and measures of distress, coping, and social support perception. A significant Pearson correlation indicated an inverse relationship for the average numbers of miles between personal social support members and the distress subscale, r (59) = -.339, $p > 0.01$ and the emotional representation subscale, r (59) = .291, $p > 0.05$ (see Table 3). Higher scores on both the distress and emotional representation subscale indicated higher

emotional distress. Results indicated that as the geographical distance increased, emotional distress levels decreased.

A bivariate correlation table with the average geographical distance of social support members and the seven extracted factors from the Principle Components Analysis indicated a significant negative relationship with the factor, "negative coping distress", r (61) = -.322, $p > 0.05$ (see Table 6). Higher scores on the factor indicated a higher likelihood of negative coping styles for infertility and higher levels of emotional distress. As the average distance of personal social support increased, negative coping styles and emotional distress levels decreased.

Discussion

The present study tested three main hypotheses: infertile women who attend in-person support groups would report lower levels of emotional distress than those who solely rely on internet support groups, individuals receiving support from personal relationships in a proximal manner would also report lower levels of emotional distress, and as the geographical location of personal social support increased, emotional distress would also increase. Although the results did not fully support all three predictions of the present study, the findings indicate that online interactions are comparable to face-to-face interactions, if not more beneficial.

No evidence was found to support the predictions that attending in-person support groups or having a primarily proximal social support network are associated with lower levels of emotional and psychological distress for women with infertility. However, a closer examination of the mean differences between groups indicates slightly higher levels of distress for those who categorized in the proximal and in-person support groups.

These findings suggest that communicating support through computer mediation, such as the Internet or cell phones may be a better way of coping with infertility.

The inverse relationship between average geographical distance of personal social support and distress subscales suggest that there are more benefits to online support groups than expected from the predictions. These results are consistent with previous research that indicate online support groups may be more appealing when discussing health-related conditions (Braithwaite et al., 1999; Davison et al., 2000; White & Dorman, 2001). Shaw and Gant (2002) found that when participants engaged in online chat sessions with anonymous strangers, levels of loneliness and depression decreased and perceptions of social support and self-esteem increased.

Researchers report that anonymity is a part of the attraction to online support groups (Braithwaite et al., 1999; Cline & Haynes, 2001; La Gaipa, 1990 as cited in Walther & Boyd, 2002; Wright, 2002; Wright & Bell, 2003). Another benefit to online support groups is the explicit expression of emotions (Barak, Boniel-Nissim, & Suler, 2008; Derks, Fischer, & Bos, 2007) that tend to be inhibited during face-to-face interactions. Individuals who attend in-person support groups may not receive more perceptive information about their condition or support because of this inhibition associated with face-to-face interactions. According to Barak et al. (2008), honesty and disclosure are important variables of group therapy. In an online setting, more disclosure may occur because of this online disinhibition. Anonymity, invisibility, and delayed reaction are factors that encourage online disinhibition and can usually only occur through computer mediated communication. Thus, the higher mean differences for the in-person attendance group could be attributed to a lack of online disinhibition during the

sessions. Participants who attend in-person groups may not receive the increased honest, emotionally explicit support that is commonly found in online support because of the online disinhibition.

Online disinhibition could also account for the results that showed higher mean differences of emotional distress for the proximal social support group. Despite a lack of anonymity, explicit emotional expression could occur more frequently in an online setting for personal relationships as well. Although researchers argued for the importance of non-verbal cues in a support setting, these same non-verbal cues could cause inhibition of disclosure that may help the coping process in the long-run. For instance, any signs of disapproval such as frowns, shaking heads, or an unpleasant tone of voice could discourage future confidence. These disapproving interactions have the potential to sever relationships, thus the extent of disclosure during face-to-face interactions is questionable. Ho and McLeod (2008) found that opinion expression was less inhibited in a chat setting, than in a face-to-face interaction setting. Fear of social isolation was likely to increase as willingness to express opinion decreased. Computer mediated communication, such as chatting online, was found to mediate the fear of social isolation. Thus, taking into account the findings of Ho and McLeod (2008), it is possible that opinion expression, which could be beneficial to the recipient of support, is suppressed during the face-to-face interactions of the proximal group out of fear of harming the relationship.

There was a significant relationship between average satisfaction rating of personal social support and emotional well-being, emotional distress, positive control subscale, perceived stress, and the extracted factors, emotional distress and controllability

of infertility, respectively. These results support the idea that satisfaction with personal social support can influence the psychological outcomes when coping with infertility. According to Stokes (1983), the extent to which individuals confide in their social support network was the strongest predictor of social support satisfaction. An explanation for the higher mean differences for the proximal group and the in-person attendance support group could be that those individuals may not confide to the extent that they could as a result of some of the benefits of online support as discussed previously.

The present study included examination of the relationship of the average distance between oneself and his/her personal social support network to emotional distress. Contrary to the prediction, having a greater amount of distance with social support may be beneficial in emotional distress for women with infertility. In this study, as the average distance increased, emotional distress decreased. However, this finding may additionally support the benefits of online communication. As distance increases, face-to-face communication is likely to decrease because of feasibility (Mok et al., 2007). Therefore, this finding is consistent with research that supports online communication as a beneficial method of receiving and giving social support (Braithwaite et al., 1999; Davison et al., 2000; Shaw & Gant, 2002; White & Dorman, 2001).

Furthermore, a negative correlation was found between the average distance of social support and the extracted factor, negative coping distress. This factor included the branch of avoidance/management coping style associated with higher levels of emotional distress (Benyamini et al., 2008). The relationship indicates that as the geographical distance for personal social support increases, tendencies for an avoidance/management

manner of coping with infertility decreases. Again, as the physical geographical distance becomes more of a barrier, face-to-face communication becomes difficult. Online communication as a medium for social support could determine coping styles. As discussed previously, online communication allows for more honesty, explicit emotional expression, and higher tendencies to express personal opinions (Barak et al., 2008; Derks et al., 2007; Ho & McLeod, 2008). This online disinhibition could serve as an "eye-opener" of women's experience with infertility that leads to healthier coping behaviors. Perhaps the internet not only serves as a way to eliminate geographical distance, but along with this benefit, increased quality of social support may exist as well.

Limitations

Although the results revealed interesting findings, limitations exist for the present study. The sample size was small, as indicated by the effect size and observed power. The results indicated that for those outcome measures that were significantly influenced by the covariate variable, satisfaction with personal social support, they had the highest observed power. An increase in sample size could allow for more accurate comparisons for the effect of satisfaction on other outcome measures of emotional distress.

A lack of power also limited the findings for group differences for both the infertility social support groupings (in-person or online) and personal social support groupings (proximal or distal). The covariate variable, average satisfaction rating, indicated that an increase of power could lead to more robust results (see Table 4). The small sample size restricted the number of participants in each group for accurate comparisons of emotional distress and coping styles based on if participants attended in-

person support groups and how social support was received from their personal relationships.

Although the inverse relationship between average geographical location and distress subscales were found to be significant and there were trends towards higher means of distress subscales between groups, results should be interpreted with caution. Pearson correlations calculated for several variables for the present study. Therefore, Type I error may have occurred, thus some of the findings may have been significant by chance. It is advisable to only strongly consider significant correlations at the .01 level. Despite the lack of power in sample size, no significant differences between groups of infertility social support and personal social support were found. Therefore, it is suggested to take the results into careful consideration with the interpretation that online communication for social support is more beneficial in comparison to face-to-face communication.

The present study was also limited by how the data were collected. All data used in the present study were collected through an online surveying site, despite an option to complete questionnaires through hardcopies. The sample may be biased because of the lack of completed surveys through alternative methods than the internet. The findings indicated beneficial associations with online communication for coping with infertility and emotional distress, but using an online surveying website could have attracted participants inclined to heavily use the Internet as a source of social support. In addition, these same participants may be accustomed to revealing more intimate information, honesty, and emotion through their online interactions, thus allowing for better quality of social support.

Conclusions and Future Implications

The importance of the Internet for communication is undeniable. Many research studies on computer mediated communication and support groups focused primarily on comparisons of the Internet versus face-to-face interactions. The present study provided interesting insight on how communication, whether online or face-to-face, with personal relationships as a source of support compares to social support groups of health related illnesses and its psychological outcomes.

Infertility is a health related illness that benefits from social support (Benyamini et al., 2008; Lechner et al., 2006; Matsubayashi et al., 2004). The results from the study allowed for circumspection that internet-based social support groups are comparable to in-person social support groups, if not better. In addition, when communicating with personal relations such as family members or friends, online communication could serve as an adequate form of social support. Whether interacting with a group of women who share similar health conditions such as infertility, or engaging in a conversation with close relationships, the Internet may not interfere with the quality of social support, but rather encourage it. Congruent with previous findings, the Internet allows for increased honesty, explicit emotional expression, and opinion expression that may be needed when coping with an illness or any other types of challenges.

The uses of the Internet as a way to communicate, receive, and provide social support is vast. The present study provides insightful information on the influence of the Internet on social support for not only infertility, but also other illnesses, and personal relationships. Replication of the present study with further focus on satisfaction with social support, larger sample size, and alternative data collection methods would be

beneficial to better understand communication trends. Studying how social support is received and provided in regards to communication has the potential to be used in other areas such as marital relationships or grievances. Without a doubt, the internet is an important part of most people's lives in advanced countries, such as the United States. Studying the role of the internet on communication, social support, and emotional outcomes will only continue to be critical as individuals becomes more and more accustomed to non face-to-face interactions

Table 1

Participant Characteristics

	Fertility Social Support		Personal Social Support	
Characteristics	Online	In-Person	Distal	Proximal
Mean age (*SD*)	33.67 (5.34)	35.38 (4.24)	35.10 (4.50)	33.92 (5.22)
Mean age when trying to conceive (*SD*)	29.64 (5.96)	32.28 (4.80)	32.10 (5.14)	29.76 (5.67)
Highest level of education (%)				
Graduate	45.5	51.9	66.7	21.1
College	45.5	40.7	30.0	63.2
High School	9.1	7.4	3.3	15.8
Income (%)				
Below $25,000	31.8	29.6	33.3	26.3
$25,000 - $45,000	22.7	18.5	10.0	36.8
$46,000 - $65,000	36.4	22.2	30.0	26.3
$66,000 - $85,000	9.1	29.6	26.7	10.5
Marital Status (%)				
Married	70.4	75.8	60.0	92.0
Single	14.8	18.2	25.7	4.0
Divorced/Separated	---	3.0	2.9	---
In a relationship	14.8	3.0	11.4	4.0
Do you have children? (%)				
Yes	29.6	9.1	20.0	16.0
No	70.4	90.9	80.0	84.0
Race (%)				
Caucasian	85.2	91.2	91.7	84.0
African - American	3.7	---	2.8	---
Asian	3.7	2.9	2.8	4.0
Hispanic/ Latino	---	2.9	2.8	---
Other	7.4	2.9	---	12.0

Table 2

Mean Test Scores of Infertility Coping, Distress, Illness Perceptions, and Social Support Scales

	Infertility Social Support				Personal Social Support			
	Online		In-Person		Distal		Proximal	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
CSSQ	15.04	3.26	14.91	3.10	14.77	3.29	15.25	2.95
Approach/Appraisal	33.20	11.99	32.85	9.65	33.20	10.30	32.71	11.25
Avoidance/Management	53.56	10.35	57.26	11.04	54.37	10.61	57.63	11.06
Spousal Support	6.52	3.60	7.82	3.71	7.23	3.68	7.33	3.78
Distress - ISWDS	39.12	7.58	41.18	7.03	39.20	7.68	41.91	6.45
Well-Being - ISWDS	32.84	7.49	34.41	9.44	32.34	8.52	35.79	8.57
Positive Control – IPQ-R	45.68	7.23	45.35	4.95	44.34	9.76	43.71	9.37
Negative Chronic – IPQ-R	50.40	9.22	52.62	8.27	49.83	8.99	54.38	7.59
Emotional – IPQ-R	24.32	5.43	25.76	3.60	24.83	4.84	25.63	3.95
MSPSS	61.56	12.16	57.24	11.92	59.94	13.31	57.79	11.92
PSS	23.16	6.93	23.79	7.13	22.77	8.07	24.63	5.01
BDI-II	18.48	10.12	21.06	10.02	17.94	9.82	22.92	9.86

Note. The Communication Social Support Questionnaire (CSSQ) was developed in the present study; the Approach/Appraisal and Avoidance/Management and spousal support are branches from the Infertility Perception Questionnaire and the Distress and Well-Being is from the Infertility Specific Well-Being and Distress Scale (ISWDQ) from Benyamini et al., (2008); The Positive Control, Negative Chronic, and Emotional are subscales from the Illness Perception Questionnaire – Revised (adapted for infertility) from Moss-Morris et al., (2002); The Multidimensional Scale of Perceived Social Support (MSPSS) is from Zimet et al., (1988); The Perceived Stress Scale (PSS) is from Cohen and Williamson (1988); the Beck Depression Inventory – II (BDI-II) is from Beck et al., (1996). For all scales, higher scores are indicative of extreme responding in the direction of the construct assessed, with the exception of Well-Being, which was reverse scored.

Table 3

Pearson Correlations between Average Geographical Distance of Personal Social Support and Infertility Distress, Coping, Illness Perceptions, and Social Support Scales

	Avg Dist	CSSQ	Spouse Support	Approach Appraisal	Avoidance Manage	Distress	Well-being	Emotion Rep	Positive Control	Negative Chronic	MSPSS	PSS	BDI	Age	Conceive Age
Average Satisfy	-.174	.059	.097	-.232	.021	.300*	.368**	.246	-.304*	.190	-.116	.267*	.210	-.060	.020
Average Distance		.037	-.084	.106	-.190	-.339**	-.061	-.291*	.206	-.108	.229	-.167	-.218	.318*	.207
CSSQ			.124	-.130	.243	-.065	.017	.056	-.187	-.063	-.056	.029	-.093	-.113	-.131
Spouse Support				.202	.124	.052	-.093	.154	.105	-.075	-.009	-.070	-.229	-.394**	-.370**
Approach Apprs					.027	-.390**	-.465**	-.286*	.289*	-.144	.302*	-.219	-.314*	-.005	-.121
Avoid Manage						.489**	.199	.494**	-.003	.413**	.026	.464**	.464**	-.199	-.307*
Distress							.475**	.633**	-.224	.423**	-.181	.562**	.709**	-.097	-.119
Well-being								.414**	-.372**	.420**	-.218	.562**	.579**	.009	.062
Emotion Rep									-.234	.489**	-.078	.472**	.579**	-.241	-.217
Positive Control										-.226	.057	-.058	-.304*	-.035	-.080
Negative Chronic											-.055	.436**	.602**	-.066	-.259
MSPSS												.006	.021	-.179	-.239
PSS													.715**	-.123	-.076
BDI														-.110	-.150
Age															.877**
Conceive Age															

Note. Average distance of personal social support was calculated by the mean number of miles between participants' own geographical location and the geographical locations of their listed social support members. ** $p < 0.01$, * $p < 0.05$.

Table 4

Effect Sizes and Power for the Covariate, Average Satisfaction Rating on Infertility Coping, Distress, Illness Perceptions, and Social Support Scales

Measurements	F	Sig.	Partial Eta Squared	Observed Power
Well-Being	**8.701**	**.005**	**.139**	**.826**
Positive Control	**5.271**	**.026**	**.089**	**.616**
Distress	**5.232**	**.026**	**.088**	**.613**
PSS	3.674	.061	.064	.469
Emotional Representation	3.360	.072	.059	.437
Approach/Appraisal	3.303	.075	.058	.431
BDI	1.841	.181	.033	.266
Negative Chronic	1.419	.239	.026	.216
MSPSS	.670	.417	.012	.127
Spouse Support	.541	.465	.010	.112
CSSQ	.041	.839	.001	.055
Avoidance/Management	.000	.990	.000	.050

Note. Outcome measures with the highest observed power are presented in boldface.

Table 5

Factor Loadings for Principal Components Factor Analysis with Varimax Rotation of Infertility Coping, Distress, Illness Perceptions, and Social Support Scales

Scale	Neg Coping Distress	Emotional Distresses	Illness Control	Distal Preference	Spousal Support	Positive Coping	Social Support
Approach/Appraisal						.795	
Avoidance/Management	.783						
Distress	.770						
Well-Being		.819					
Positive Control			.922				
Negative Chronic	.592						
PSS		.781					
BDI	.662	.541					
CSSQ				.963			
CIQ Spouse					.967		
Emotional Representation	.797						
MSPSS							.964

Table 6

Pearson Correlation between Average Geographical Distance of Personal Social Support and Extracted Factor Components

	Negative Coping Distress	Emotional Distresses	Illness Control	Distal Preference	Spousal Support	Positive Coping	Social Support
Average Distance	-.322*	.042	.110	.053	.085	.107	-.077

* $p < 0.05$.

Appendices

TOWSON UNIVERSITY

EXEMPTION NUMBER: 10-1X64

To: Alexandra Chong

From: Institutional Review Board for the Protection of Human Subjects, Gerald Jerome, Member

Date: Thursday, June 10, 2010

RE: Application for Approval of Research Involving the Use of Human Participants

Office of University Research Services

Towson University
8000 York Road
Towson, MD 21252-0001

t. 410 704-2236
f. 410 704-4494

Thank you for submitting an application for approval of the research titled,

The Communication Tango: A Closer Look at the Dimensions of Social Support and Psychological Distress of Infertile Women

to the Institutional Review Board for the Protection of Human Participants (IRB) at Towson University.

Your research is exempt from general Human Participants requirements according to 45 CFR 46.101(b)(2). No further review of this project is required from year to year provided it does not deviate from the submitted research design.

If you substantially change your research project or your survey instrument, please notify the Board immediately.

We wish you every success in your research project.

CC: Kim Shifren
File

Informed Consent

Principle Investigator: Alexandra Chong, Department of Psychology, Towson University

This is a study in which we are examining any differences in various dimensions of the support you receive in regards to your infertility and how these possible differences are related to your psychological well-being.

In this study we will collect information about how you receive informational and social support during the challenges of infertility. Information such as if you participate in an online support group forum, or attend in-person support group sessions and how you communicate with your personal social support network will be recorded. You will be asked to complete a set of questionnaires either online, over the telephone, or by mail, depending on your personal preference. Completion of the questionnaire should take no more than 15-20 minutes.

There are no risks associated with participating in the study. Should you become distressed or uncomfortable, we will terminate the session immediately. Although there are no direct benefits to you, we hope that the results of the study will reveal something about human behavior.

Participants must be at least 18 years old.
Participants CANNOT be currently pregnant.
Participants must have experienced or is currently experiencing challenges with their fertility in the last 6 months or more.

Your participation is entirely voluntary. You do not have to participate in the study. If you choose to participate, you many discontinue your participation at any time. Your decision to participate or not to participate will not impact the healthcare or support you receive in regards to your infertility.

All information about your responses will remain confidential. We will not show your information to anyone outside of our research team unless you give us written permission. Your responses will never be linked to your name. If you have any questions, you may ask them now or at any time during the study. If you should have questions after today, you can call the Principle Investigator, Alexandra Chong at (240) 422- 6946, or the Faculty Sponsor, Dr. Kim Shifren at (410) 704-6239 or call (410) 704-2236 and ask for Dr. Debi Gartland, Chairperson of the Institutional Review Board for the Protection of Human Participants at Towson University.

I _____ affirm that I have read and understand the above statements and have had all of my questions answered.

Date: _____

Signature: _____

The Communication Social Support Questionnaire

Social support is the use of relationships as a resource to cope with various situations. Social support can include friends, family members, mentors, or anyone who you feel you look towards for support. This questionnaire is designed to see how different types of social support are utilized. Please complete each task and question carefully and accurately.

Part I

Thinking about your experiences with your infertility, please identify your main source of information and support:

□$_1$ Online – participation in online messaging boards, websites of infertility organizations, using the Internet to find more information, chatting/emailing with other women with my condition

□$_2$ In-person – attending support group sessions, going to a fertility clinic, attending seminars or information sessions about infertility.

Part II

Please identify <u>three</u> people in your life who are NOT part of infertility support network who you consider to be a part of your social support network. <u>You must list three and only three individuals</u>. Identify the individuals by their initials, using their first and last name on the first blank space. The order of the listed individuals is not relevant.

Next, for <u>each</u> individual you list, please write their relationship to you, where he or she lives, and the level of satisfaction you feel for the social support you receive from that individual. Do not leave any blanks.

Social Support Individual (Initials)	Relationship to You	Location of Social Support Individual (city, state)	Level of Satisfaction of Social Support
1.			□$_1$ Dissatisfied □$_2$ Neutral □$_3$ Satisfied
2.			□$_1$ Dissatisfied □$_2$ Neutral □$_3$ Satisfied
3.			□$_1$ Dissatisfied □$_2$ Neutral □$_3$ Satisfied

Part III

For each individual, list their initials <u>again</u> and please check off in the appropriate box how you typically communicate with them throughout a normal 7-day week, excluding school breaks and holidays. PLEASE SELECT ONLY ONE RESPONSE FOR EACH INDIVIDUAL.

Social Support Individual (Initials)	Type of Communication
1.	☐$_1$ **Face-to-face contact**: Visits are physically made. You see the individual in person. ☐$_2$ **Non face-to-face contact:** Telephone calls, e-mails, chatting. You do NOT see the individual in person.
2.	☐$_1$ **Face-to-face contact**: Visits are physically made. You see the individual in person. ☐$_2$ **Non face-to-face contact:** Telephone calls, e-mails, chatting. You do NOT see the individual in person.
3.	☐$_1$ **Face-to-face contact**: Visits are physically made. You see the individual in person. ☐$_2$ **Non face-to-face contact:** Telephone calls, e-mails, chatting. You do NOT see the individual in person.

Part IV

For the following statements, please take into consideration the individuals you listed as a part of your social support network. Please circle the most appropriate response.

1. I appreciate physical contact (i.e. hugs, kisses, hand-holding, pats on the back).	☐$_5$ I definitely agree ☐$_4$ I slightly agree ☐$_3$ I am not sure ☐$_2$ I slightly disagree ☐$_1$ I definitely disagree
2. I can tell a lot about someone's emotions and feelings from their facial expressions or body language.	☐$_5$ I definitely agree ☐$_4$ I slightly agree ☐$_3$ I am not sure ☐$_2$ I slightly disagree ☐$_1$ I definitely disagree
3. I feel a sense of increased intimacy when I see someone in person.	☐$_5$ I definitely agree ☐$_4$ I slightly agree ☐$_3$ I am not sure ☐$_2$ I slightly disagree ☐$_1$ I definitely disagree
4. I feel more comfortable disclosing private, personal information over the telephone, internet, chatting, or e-mail	☐$_1$ I definitely agree ☐$_2$ I slightly agree ☐$_3$ I am not sure ☐$_4$ I slightly disagree ☐$_5$ I definitely disagree
5. I find that I express myself best when I can write down my thoughts, feelings, or emotions.	☐$_1$ I definitely agree ☐$_2$ I slightly agree ☐$_3$ I am not sure ☐$_4$ I slightly disagree ☐$_5$ I definitely disagree
6. I do not find it necessary to see someone in person to discuss serious issues.	☐$_1$ I definitely agree ☐$_2$ I slightly agree ☐$_3$ I am not sure ☐$_4$ I slightly disagree ☐$_5$ I definitely disagree

Coping with Infertility Questionnaire

Fertility problems arouse many different reactions among different people. Below is a list of possible reactions. Please rate next to each one of them the extent to which this reaction characterizes you, with regard to the infertility problem.

Social Withdraw

1. I avoid social events in which people might inquire about the problem
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

2. I meet with relatives less frequently
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

3. I avoid being with women who have children or are expecting a baby
   0 = never 1= a few times 2 = sometimes 3 = many times 4 = all the time

Denial

4. I tell myself that it isn't really happening to me
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

5. I pretend that it isn't really happening to me
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

6. I refuse to believe that it has happened
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Self-blame

7. When a treatment fails, I blame myself
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

8. I blame myself for postponing the treatment
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

9. I feel I am "not okay" because I don't have children
   0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Self-neglect

10. My looks, make-up, clothes, etc., are less important to me than in the past
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

11. At this time I don't have the patience to invest in my appearance
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

12. I engage in eating, drinking alcohol, smoking, using drugs, or medications more than in the past
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Disclosure

13. I don't want other people to know about my problem
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

14. I tend not to talk about the problem
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

15. I share the problem with almost everyone around me
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

16. I limit family and friends' involvement in the problem
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Acceptance

17. I get used to the idea that it happened
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

18. I learn to live with it
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

19. I accept the reality as it is
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Positive re-interpretation

20. I try to see the matter in a different light to make it seem more positive
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

21. I try to think about the positive side of the situation
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

22. I look for something good in what is happening
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Recruiting spouse support

23. I rely on my spouse's help regarding treatments, appointment, etc.
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

24. I try to have my partner with me when I come in treatment
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

25. I try to include my partner in every aspect of the problem
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Compensation

26. I treat myself to a good meal, shopping etc.
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

27. I compensate myself by doing something I like, such as going out with my partner, etc.
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

28. I pay more attention than in the past to my personal appearance
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

29. I take more care of my physical appearance
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

30. I engage more than I used to in activities that I enjoy
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Investing in myself

31. I engage in physical activity
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

32. I engage in activities that I find soothing such as, relaxation, massage, etc.
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

33. It is more important to me to develop myself in various ways: Classes, hobbies, workshops
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Seeking social support

34. I ask a relative or friend I respect for advice
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

35. I look for assistance from different people
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

36. I try to get close to and see support from women in my condition or who have been in my condition
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

37. I ask people who have had similar experiences what they did
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Planning and information-seeking

38. I try to find out more details about the situation
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

39. I think about the next steps, if the current attempt will not be successful
    0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

40. I read books or articles about the problem

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

41. I consider several alternatives for solving the problem

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

42. I think of the best way to handle the problem

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

43. I ask for explanations about the problem and the treatment

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

44. I try to be involved in the decisions made regarding the problem

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Spiritual Coping

45. I try to find comfort in my religion or faith

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

46. I pray more than usual

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

47. I put my trust in God

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

48. I seek the blessing of a clergyman/rabbi, look for tokens of good luck, etc.

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

Hope

49. I cheer myself on by telling myself that I too will be a mother some day

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

50. I imagine a future, how things will look when the problem is solved

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

51. I imagine better times

0 = never 1 = a few times 2 = sometimes 3 = many times 4 = all the time

The Infertility Specific Well-Being and Distress Scale

For each emotion, please indicate to what extent each item is descriptive of your feelings *recently*.

Emotional Distress

1. **Empty**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

2. **Depressed**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

3. **Lonely**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

4. **Angry**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

5. **Disappointed**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

6. **Left out**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

7. **Sad**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

8. **Frustrated**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

9. **Impatient**

   1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

10. **Worried**

    1 = not at all 2 = slightly 3 = neutral 4 = somewhat 5 = exactly

Emotional Well-being

11. Happy
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

12. Optimistic
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

13. Proud
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

14. Confident
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

15. Contented
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

16. Capable
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

17. Secure
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

18. Competent
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

19. Enthusiastic
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

20. Pleased
1 = exactly 2 = somewhat 3 = neutral 4 = slightly 5 = not at all

Illness Perception Questionnaire

We are interested in your own personal views of how you now see your infertility.
Please indicate how much you agree or disagree with the following statements about your infertility by ticking the appropriate box.

1 = Strongly disagree
2 = Disagree
3 = Neither agree or disagree
4 = Agree
5 = Strongly agree

1. **My infertility will last a short time**

   1 2 3 4 5

2. **My infertility will likely be a permanent rather than temporary**

   1 2 3 4 5

3. **My infertility will last for a long time**

   1 2 3 4 5

4. **This infertility will pass quickly**

   1 2 3 4 5

5. **I expect to have this infertility for the rest of my life**

   1 2 3 4 5

6. **My infertility is a serious condition**

   1 2 3 4 5

7. **My infertility has major consequences on my life**

   1 2 3 4 5

8. **My infertility does not have much effect on my life**

   1 2 3 4 5

9. **My infertility strongly affects the way others**

   1 2 3 4 5

10. **My infertility has serious financial consequences**

    1 2 3 4 5

11. My infertility causes difficulties for those who are close to me

1 2 3 4 5

12. There is a lot which I can do to control my symptoms

1 2 3 4 5

13. What I can do determine whether my infertility gets better or worse

1 2 3 4 5

14. The course of my infertility depends on me

1 2 3 4 5

15. Nothing I do will affect my infertility

1 2 3 4 5

16. I have the power to influence my infertility

1 2 3 4 5

17. My actions will have no affect on the outcome of my infertility

1 2 3 4 5

18. My infertility will improve in time

1 2 3 4 5

19. There is very little that can be done to improve my infertility

1 2 3 4 5

20. My treatment will be effective in curing my infertility

1 2 3 4 5

21. The negative side effects of my infertility can be prevented (avoided) by my treatment

1 2 3 4 5

22. My treatment can control my infertility

1 2 3 4 5

23. There is nothing which can help my condition

1 2 3 4 5

24. The symptoms of my condition are puzzling to me

1 2 3 4 5

25. My infertility is a mystery to me

1 2 3 4 5

26. I don't understand my infertility

1 2 3 4 5

27. My infertility doesn't make any sense to me

1 2 3 4 5

28. I have a clear picture or understanding of my condition

1 2 3 4 5

29. The symptoms of my infertility change a great deal from day to day

1 2 3 4 5

30. My symptoms come and go in cycles

1 2 3 4 5

31. I go through cycles in which my infertility gets better and worse

1 2 3 4 5

32. I get depressed when I think about my infertility

1 2 3 4 5

33. When I think about my infertility I get upset

1 2 3 4 5

34. My infertility makes me angry

1 2 3 4 5

35. My infertility does not worry me

1 2 3 4 5

36. Having infertility make me feel anxious

1 2 3 4 5

37. My infertility makes me feel afraid

1 2 3 4 5

Causes of my infertility

We are interested in what you consider may have been the cause of your infertility. As people are very different, there is no correct response for this question. We are most interested in your own views about the factors that contributed to your infertility rather than what others, including doctors or family may have suggested to you. Below is a list of possible causes for your infertility. Please indicate how much you agree or disagree that they were causes for you by ticking the appropriate box.

1 = Strongly disagree
2 = Disagree
3 = Neither agree or disagree
4 = Agree
5 = Strongly agree

1. Stress or worry

1 2 3 4 5

2. Hereditary – it runs in the family

1 2 3 4 5

3. A germ or virus

1 2 3 4 5

4. Diet or eating habits

1 2 3 4 5

5. Chance or bad luck

1 2 3 4 5

6. Poor medical care in my past

1 2 3 4 5

7. Pollution to the environment

1 2 3 4 5

8. My own behavior

1 2 3 4 5

9. My mental attitude, e.g. thinking about life negatively

1 2 3 4 5

10. Family problems or worries

1 2 3 4 5

11. Overwork

1 2 3 4 5

12. My emotional state, e.g. feeling down, lonely, anxious, or empty

1 2 3 4 5

13. Ageing

1 2 3 4 5

14. Alcohol

1 2 3 4 5

15. Smoking

1 2 3 4 5

16. Accident or injury

1 2 3 4 5

17. My personality

1 2 3 4 5

18. Altered immunity

1 2 3 4 5

In the table below, please list in rank-order the three most important factors that you believe caused your infertility. You may use any items from the box above, or you may have additional ideas of your own.

The most important causes for me:

1. _____

2. _____

3. _____

Multidimensional Scale of Perceived Social Support

INSTRUCTIONS: We are interested in how you feel about the following statements. Please read each statement carefully. Indicate how you feel about each statement.

1 = Very strongly disagree
2 = Strongly disagree
3 = Mildly disagree
4 = Neutral
5 = Mildly agree
6 = Strongly agree
7 = Very strongly agree

1. There is a special person who is around when I am in need.
1 2 3 4 5 6 7

2. There is a special person with whom I can share my joys and sorrows.
1 2 3 4 5 6 7

3. My family really tries to help me.
1 2 3 4 5 6 7

4. I get the emotional help and support I need from my family.
1 2 3 4 5 6 7

5. I have a special person who is a real source of comfort to me.
1 2 3 4 5 6 7

6. My friends really try to help me
1 2 3 4 5 6 7

7. I can count on my friends when things go wrong.
1 2 3 4 5 6 7

8. I can talk about my problems with my family.
1 2 3 4 5 6 7

9. I have friends with whom I can share my joys and sorrows.
1 2 3 4 5 6 7

10. There is a special person in my life who cares about my feelings.
1 2 3 4 5 6 7

11. My family is willing to help me make decisions.
1 2 3 4 5 6 7

12. I can talk about my problems with my friends
1 2 3 4 5 6 7

Perceived Stress Scale

INSTRUCTIONS: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with a check how often you felt or thought a certain way.

0 = Never 1 = Almost never 2 = Sometimes 3 = Fairly often 4 = Very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
0 1 2 3 4

2. In the last month, how often have you felt that you were unable to control the important things in your life?
0 1 2 3 4

3. In the last month, how often have you felt nervous and "stressed"?
0 1 2 3 4

4. In the last month, how often have you felt confident about your ability to handle your personal problems?
0 1 2 3 4

5. In the last month, how often have you felt that things were going your way?
0 1 2 3 4

6. In the last month, how often have you found that you could not cope with all the things that you had to do?
0 1 2 3 4

7. In the last month, how often have you been able to control irritations in your life?
0 1 2 3 4

8. In the last month, how often have you felt that you were on top of things?
0 1 2 3 4

9. In the last month, how often have you been angered because of things that were outside of your control?
0 1 2 3 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
0 1 2 3 4

Beck Depression Inventory Scale – II

INSTRUCTIONS: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement that best describes the way you have been feeling during the past <u>two weeks, including today</u>. Check the appropriate box beside the statement you have picked. If several statements in the group apply equally well select the highest number for the group. Be sure that you do not choose more than one statement for the group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness	☐$_0$ I do not feel sad ☐$_1$ I feel sad most of the time ☐$_2$ I am sad all the time ☐$_3$ I am so sad or unhappy I can hardly stand it
2. Pessimism	☐$_0$ I am not discouraged about my future ☐$_1$ I feel more discouraged about my future than I used to be. ☐$_2$ I do not expect things to work out for me ☐$_3$ I feel my future is hopeless and will only get worse.
3. Past failure	☐$_0$ I do not feel like a failure. ☐$_1$ I have failed more than I should have. ☐$_2$ As I look back, I see a lot of failures. ☐$_3$ I feel as if I am a total failure.
4. Loss of pleasure	☐$_0$ I get as much pleasure as I ever did from the things I enjoy ☐$_1$ I don't enjoy things as much as I used to. ☐$_2$ I get very little pleasure from the things I used to enjoy ☐$_3$ I can't get any pleasure from the things I used to enjoy.
5. Guilty feelings	☐$_0$ I don't feel particularly guilty ☐$_1$ I feel guilty over many things I have done or should have done. ☐$_2$ I feel quite guilty most of the time. ☐$_3$ I feel guilty all of the time.
6. Punishment feelings	☐$_0$ I don't feel I am being punished. ☐$_1$ I feel I may be punished. ☐$_2$ I expect to be punished. ☐$_3$ I feel I am being punished.
7. Self-dislike	☐$_0$ I feel the same about myself as ever. ☐$_1$ I have lost self – confidence in myself. ☐$_2$ I am disappointed in myself. ☐$_3$ I dislike myself.
8. Self-criticalness	☐$_0$ I don't criticize or blame myself more than usual

	☐$_1$ I am more critical of myself than I used to be. ☐$_2$ I criticize myself for all my faults. ☐$_3$ I blame myself for everything bad that happens.
9. Suicidal thoughts or wishes	☐$_0$ I don't have any thoughts of killing myself. ☐$_1$ I have thoughts of killing myself, but I would not carry them out. ☐$_2$ I would like to kill myself. ☐$_3$ I would kill myself if I had the chance.
10. Crying	☐$_0$ I don't cry any more than I used to ☐$_1$ I cry more than I used to. ☐$_2$ I cry over every little thing. ☐$_3$ I would kill myself if I had the chance.
11. Agitation	☐$_0$ I am no more restless or wound up than usual. ☐$_1$ I feel more restless or wound up than usual. ☐$_2$ I am so restless or agitated that it's hard to stay still. ☐$_3$ I feel so restless or agitated that I keep moving or doing something.
12. Loss of Interest	☐$_0$ I have not lost interest in other people or activities.. ☐$_1$ I am less interested in other people or things. ☐$_2$ I have lost most of my interest in other people or things. ☐$_3$ It's hard to get interested in anything.
13. Indecisiveness	☐$_0$ I make decisions about as well as ever. ☐$_1$ I find it more difficult to make decisions than usual. ☐$_2$ I have much greater difficulty in making decisions than I used to. ☐$_3$ I have trouble making any decisions.
14. Worthlessness	☐$_0$ I do not feel I am worthless. ☐$_1$ I don't consider myself as worthwhile and useful as I used to. ☐$_2$ I feel more worthless compare to other people ☐$_3$ I feel utterly worthless.
15. Loss of energy	☐$_0$ I have as much energy as ever. ☐$_1$ I have less energy than I used to have. ☐$_2$ I don't have enough energy to do very much. ☐$_3$ I don't have any enough energy to do anything.
16. Changes in sleeping pattern	☐$_0$ I have not experienced any change in my sleeping pattern. ☐$_{1a}$ I sleep somewhat more than usual. ☐$_{1b}$ I sleep somewhat less than usual. ☐$_{2a}$ I sleep a lot more than usual. ☐$_{2b}$ I sleep a lot less than usual.

	☐$_{3a}$ I sleep most of the day. ☐$_{3b}$ I wake up 1-2 hours early and can't get back to bed.
17. Irritability	☐$_0$ I am no more irritable than usual. ☐$_1$ I am more irritable than usual. ☐$_2$ I am much more irritable than usual. ☐$_3$ I am irritable all the time.
18. Changes in appetite	☐$_0$ I have not experienced any change in my appetite. ☐$_{1a}$ My appetite is somewhat less than usual. ☐$_{1b}$ My appetite is somewhat greater than usual. ☐$_{2a}$ My appetite is much less than before. ☐$_{2b}$ My appetite is much greater than usual. ☐$_{3a}$ I have no appetite at all. ☐$_{3b}$ I crave food all the time.
19. Concentration Difficulty	☐$_0$ I can concentrate as well as ever. ☐$_1$ I can't concentrate as well as usual. ☐$_2$ It's hard to keep my mind on anything for very long. ☐$_3$ I find I can't concentrate on anything.
20. Tiredness or Fatigue	☐$_0$ I am no more tired or fatigued than usual. ☐$_1$ I get more tired or fatigued more easily than usual. ☐$_2$ I am too tired or fatigued to do a lot of things I used to do. ☐$_3$ I am too tired or fatigued to do most of the things I used to do.
21. Loss of Interest in Sex	☐$_0$ I am not noticed any recent change in my interest in sex. ☐$_1$ I am less interested in sex than I used to be. ☐$_2$ I am much less interested in sex now. ☐$_3$ I have lost interested in sex completely.

Demographics

Age: _____

At what age did you decide to start conceiving? _____

Sex: _____

Location (City, State, Country): _____

Race

- □5 Caucasian
- □4 African – American
- □3 Asian
- □2 Hispanic/Latino
- □1 Native American
- □0 Other

Do you currently have any children?

- □1 Yes
- □0 No

Marital Status

- □5 Married
- □4 Single
- □3 Divorced
- □2 Separated
- □1 In a Relationship
- □0 Other

Highest Level of Education

- □4 Graduate Degree
- □3 College Degree
- □2 High School Degree
- □1 Completed some high school
- □0 Completed some middle school

What is your current occupation? _____

What is your annual income?

- □4 Below $25,000
- □3 $26,000 - $45,000
- □2 $46,000 - $65,000
- □1 $66,000 - $85,000
- □0 Over $85,000

References

Barak, A., Boniel-Nissim, M., Suler, J. (2008). Fostering empowerment in online support groups. *Computers in Human Behavior, 28,* 1867 – 1883.

Beck, A.T., Steer, R.A., Brown, G.K. (1996). BDI-II: Beck Depression Inventory-II.

Benyamini, Gozlan, & Kokia (2004). On the self-regulation of a health threat: Cognitions, coping, and emotions among women undergoing treatment for infertility. *Cognitive Therapy and Research 28*(5), 577 – 592.

Benyamini, Y., Gefen-Bardarian, Y., Gozlan, M., Tabiv, G., Shiloh, S., & Kokia, E. (2008). Coping specificity: The case of women coping with infertility treatments. *Psychology and Health, 23*(2), 221 – 241.

Berghuis, J.P., & Stanton, A.L. (2002). Adjustment to a dyadic stressor: A longitudinal study of coping and depressive symptoms in infertile couples over an insemination attempt. *Journal of Consulting and Clinical Psychology, 70*(20), 433 – 438.

Braithwaite, D.O., Waldron, V.R., & Finn, J. (1999). Communication of social support in computer-mediated groups for people with disabilities. *Health Communication, 11*(2), 123 – 151.

Carver, C.S., & Connor – Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61,* 679 – 704.

Carver, C.S. & Scheier, M.F., (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267 – 284.

Cline, R.W., & Haynes, K.M. (2001). Consumer health information seeking on the Internet: the state of the art. *Health Education Research, 16*(6), 671 – 692.

Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), The social psychology of health: Claremont Symposium on applied social psychology. Newbury Park, CA: Sage.

Copeland, A.P. & Norell, S.K. (2002). Spousal adjustment on international assignments: the role of social support. *International Journal of Intercultural Relations, 26*, 255-272.

Coulson, N.S. (2005). Receiving social support online: An analysis of computer-mediated support group for individuals living with irritable bowel syndrome. *CyberPsychology and Behavior, 8*(6), 580 – 584.

Coulson, N.S., Buchanan, H., & Aubeeluck, A., (2007). Social support in cyberspace: A content analysis of communication within a Huntington's Disease online support group. *Patient Education and Counseling, 68*(2), 173 – 178.

Davison, K.P., Pennebaker, J.W., & Dickerson, S.S. (2000). Who talks? The social psychology of illness support groups. *American Psychologist, 55*(2), 205 – 217.

Derks, D., Fischer, A.H., & Bos, A.R. (2007). The role of emotion in computer-mediated communication: A review. *Computers in Human Behavior 24(*3), 766 – 785.

Dunson, D.B., Baird, D.D., & Colombo, B. (2004). Increased infertility with age in men and women. *Obstetrics and Gynecology, 103*, 51 – 56.

Epstein, Y.M., Rosenberg, H.S., Venet Grant, T., Hemenway, N. (2002). Use of the Internet as the only outlet for talking about infertility. *Fertility and Sterility, 78*(3), 507 – 514.

Galinsky, M.J., Schopler, J.H., & Abell, M.D., (1997). Connecting group members through telephone and computer groups. *Health and Social Work, 22*, 181 – 188.

Goldin-Meadow, S., McNeill, D., Singleton, J. (1996). Silence is liberating: Removing the handcuffs on grammatical expression in the manual modality. *Psychological Review, 103*(1), 34-55.

Gnoth, C., Godehardt, D., Godehardt, E., Frank-Hermann, P., & Freudl, G. (2003). Time to pregnancy: results of the German perspective study and impact of the management of infertility. *Human Reproduction, 18*(9), 1959 – 1966 .

Hansen, J.P. (1986). Older pregnancy age and maternal outcome: A review of the literature. *Obstetrical and Gynecological Survey, 41*(11), 726.

Hepworth, M. (1991). Information technology and the global restructuring of capital markets. In: Brunn, S., Lenibach,T.R. (Eds.), *Collapsing Space and Time: Geographical Aspects of Communications and Information.* Harper Collins Academic: London, pp. 132-148.

Lechner, L., Bolman, C., & VanDalen, A. (2006). Definite involuntary childlessness: Associations between coping, social support, and psychological distress. *Human Reproduction, 22*(1), 288 – 294.

Leung, L., & Lee, P.S. (2004). Multiple determinants of quality of life: the roles of internet activities, use of media, social support, and leisure activities. *Telematics and Informatics, 22*(3), 161 – 180.

McQuillian, J., Greil, A.L., White, L., & Jacob, M.C. (2003). Frustrated fertility: Infertility and psychological distress among women. *Journal of Marriage and Family, 65*, 1007 – 1118

Matsubayashi, H., Hosaka, T., Shun-ichiro, I., Suzuki, T., Kondo, A., & Makino, T., (2004). Increased depression and anxiety in infertile Japanese women resulting from lack of husband's support and feelings of stress. *General Hospital Psychiatry, 26*, 398 – 404

McDonald, P. (2000). Gender equity, social institutions, and the future of fertility. *Journal of Population Research, 17*(1), 1 – 16

Mok, D., Wellman, B., & Basu, R. (2007). Did distance matter before the Internet? Interpersonal contact and support in the 1970's. *Social Networks, 29*, 430-461

Moss-Morris, R., Weinman, J., Petrie, K. J., Horne, R., Cameron, L.D., & Buick, D. (2002). The Revised Illness Perception Questionnaire (IPQ-R). *Psychology and Health. 17*, 1-16.

Shaw, L.H., & Gant, L.M. (2002). In defense of the internet: The relationship between internet communication and depression, loneliness, self-esteem, and perceived social support. *Cyberpsychology & Behavior 5*(2), 157 – 171.

Sherbourne, C.D., & Stewart, A.L. (1991). The MOS social support survey. *Social Science Medicine, 32*(6), 705 – 714.

Stokes, J.P. (1983). Predicting satisfaction with social support from social network structure. *American Journal of Community Psychology, 11*(2), 141 – 152.

Thrift, N., Leyshon, A., (1988). The gambling propensity: banks, developing country department exposure, and the new international financial system. *Geoforum, 19*, 197-225.

United States Center for Disease Control and Prevention (2010). Retrieved from http://www.cdc.gov/reproductivehealth/Data_Stats/index.htm.

Verhaak, C.M., Smeenk, J.J., van Minnen, A., Kremer, J.M., & Kraaimaat, F.W. (2005). A longitudinal, prospective study on emotional adjustment before, during, and after consecutive fertility cycles. *Human Reproduction, 20*(8), 2253 – 2260.

Walther, J.B., & Boyd, S. (2002). Attraction to computer-mediated social support. In C. Lin and D. Atkin (Eds), *Communication Technology and Society: Audience Adoption and Uses.* Cresskill, NJ: Hampton Press. 153 – 188.

Wright, K. (2002). Social support within an on-line cancer community: An assessment of emotional support, perceptions of advantages and disadvantages, and motives for using the community from a communication perspective. *Journal of Applied Communication and Research, 30 (*3), 195 – 209.

Wright, K.B. & Bell, S.B. (2003). Health-related support groups on the internet: Linking empirical findings to social support and computer-mediated communication theory. *Journal of Health Psychology, 8(1),* 39 – 54.

White, M. & Dorman, S.M. (2001). Receiving social support online: implications for health education. *Health Education Research, 16*(6), 693 – 707.

Zimet, G.D., Dahlem, N.W., Zimet, S.G., & Farley, G.K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52*(1), 30 – 41

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Shifren, K., & **Chong, A**. (2010). Early caregiving experiences: The effects on adult health behaviors. *Manuscript in preparation.*

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