E-MEDIATED COMMUNICATION: EFFECTS ON SATISFACTION AND ANXIETY LEVELS IN INFERTILITY PATIENTS

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Joni Stead

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E-MEDIATED COMMUNICATION: EFFECTS ON SATISFACTION AND ANXIETY
LEVELS IN INFERTILITY PATIENTS

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Department of Communication Studies
Abstract

of

E-MEDIATED COMMUNICATION: EFFECTS ON SATISFACTION AND ANXIETY LEVELS IN INFERTILITY PATIENTS

by

Joni Stead

This study examined infertility patients’ communication with their physicians. Face-to-face, phone, and electronic communication were analyzed to measure patients’ satisfaction and anxiety levels. Participants included 53 women ranging in age between 21-50 years old who were previously or currently being treated for infertility at Northern California Fertility Medical Center. Patients were invited to participate in an online survey, which consisted of both quantitative and qualitative questions. Overall patient satisfaction and anxiety were evaluated using a 5-point Likert-type scale. Media richness theory was used to explain the communication bandwidth in determining patient-centered communication preferences. Results show that communication satisfaction levels in patients were high. Patient E-mail communication satisfaction had a positive correlation to lower anxiety levels.

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____________________________
Date

iv
PREFACE

The diagnosis of infertility (impaired fecundity) currently affects over 22% of women ages 15-44 in the United States (Chandra, Martinez, Mosher, Abma, & Jones, 2005). The term refers to a woman who may have a physical condition that prevents them from conceiving a child or carrying a baby, and who has not been surgically sterilized.

The National Survey of Family Growth (NSFG) has been evaluating fertility impairments since 1982 (Chandra et al., 2005, p. 21). In 2002, impaired fecundity affected 7.3 million women ages 15-44. This was a 2% increase from 1988 and 1995 (Chandra et al., 2005, p. 22). The Chandra et al. (2005) study also found that infertility is a growing medical problem among women 15-44, and that there is no association with education, income, or race (Chandra et al., 2005, p. 23). In addition, the NSFG study concluded that up to 7.5% of men also experience some form of impaired fecundity in their lifetime. According to Resolve.org, The National Infertility Association, approximately 10% of the U.S. population is affected by infertility (Resolve.org, 2011). However, another study indicates up to 15% of couples may experience infertility (Watkins & Baldo, 2004). Thus, infertility is a sizable problem that affects women and men in the United States.

Infertility treatment is available to all Americans. However, studies show that satisfaction levels vary among infertility patients depending on the types of satisfaction questions asked. Because infertility patients bring anxiety with them before being
treated, this may exacerbate the problem. Treatment for infertility has improved (Schmidt, 1998) and satisfaction related to medical intervention is high. However, satisfaction levels related to doctor-patient communication, the experience and information provided by the doctors has been rated low in numerous studies (Schmidt, 1998). A newer form of communication among doctors and patients is electronic communication, such as E-mail and patient access to electronic medical records. Electronic communication may help in decreasing anxiety among patients and increasing satisfaction.

This study proposed that patients who use electronic communication with their doctors in addition to traditional forms of communication including face-to-face, telephone and written documents will have high levels of satisfaction. This study assessed the communication patterns of doctors and patients, and the relationship to both patient satisfaction and anxiety levels.

The study recruited 53 participants including females 21-50 years old. Two categories of patients were invited to participate in the study. The first category was female patients who are current patients, and the second category is previous patients at one infertility clinic. Participants were asked to complete a 54-question survey containing demographic questions, 33 Likert-type scale and 12 open-ended questions. The objective was to collect both quantitative and qualitative data to investigate the effect of computer mediated communication on patient satisfaction and anxiety levels.
DEDICATION

NCFMC – Words cannot express my admiration for your services and support of this thesis. Most importantly…Thank you for our son.

Dr. Stitt – For having the patience to walk with me day by day as I slowly found my way to the light at the end of the tunnel. It is so beautiful.

Dr. Foss – For your energy, unending support and your witt! You told me how it was, sat back and watched me reach the finish line!

Dr. Bonilla – For your excitement and genuine interest in my thesis research and for your expert guidance in computer mediated communication. What I have learned from you will live with me forever.

To my husband, daughter and son – Thank you for your love, support and encouragement. I am grateful to each of you for everything you have done to help me. I love you each unconditionally…Forever and a day!
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>v</td>
</tr>
<tr>
<td>Dedication</td>
<td>vii</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. LITERATURE REVIEW</td>
<td>5</td>
</tr>
<tr>
<td>Patients’ Experiences with Infertility</td>
<td>5</td>
</tr>
<tr>
<td>E-Mediated Communication</td>
<td>15</td>
</tr>
<tr>
<td>The Problem</td>
<td>24</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>25</td>
</tr>
<tr>
<td>Research Questions</td>
<td>27</td>
</tr>
<tr>
<td>3. METHOD</td>
<td>28</td>
</tr>
<tr>
<td>Design</td>
<td>28</td>
</tr>
<tr>
<td>Procedure</td>
<td>29</td>
</tr>
<tr>
<td>Participants</td>
<td>31</td>
</tr>
<tr>
<td>Measures</td>
<td>31</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>33</td>
</tr>
<tr>
<td>4. RESULTS</td>
<td>35</td>
</tr>
<tr>
<td>5. DISCUSSION</td>
<td>40</td>
</tr>
<tr>
<td>Limitations</td>
<td>49</td>
</tr>
</tbody>
</table>
Chapter 1

INTRODUCTION

Medical research successfully led to the creation of human life in a petri dish. Louise Joy Brown, the world’s first in vitro-fertilization baby was born on July 25, 1978. Louise was conceived after nine years of trying to conceive a child. For the first time, infertility was treatable (PBS.org, n.d.). In 2003, a study found that due to the high demand for infertility treatment that infertility treatment was increasing throughout the world (Schmidt et al., 2003). Nearly two decades after the first successful in vitro fertilization, a ground breaking study concluded that over 5 million couples in the United States suffer from one or more forms of infertility (Schmidt, 2006).

Infertility does not discriminate and affects all racial and socioeconomic groups (Shapiro, 2007). The American Society for Reproductive Medicine (ASRM; 2011) declared "Infertility is a disease." This was the first designation by a medical society to define infertility as a disease. In 2010, the World Health Organization (WHO) also acknowledged that infertility is a disease and defined it as, “A disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse” (WHO, 2010, para. 1-2). In a press release, WHO cited that for too long individuals who suffer from infertility have been ignored. WHO also stated that, based on a WHO-DHS report in 2004, one in four married women in most developing countries were infertile.
The right to conceive and raise a child has been deemed essential by the United States Supreme Court in *Meyer v. Nebraska* (1923). It was also defined as a basic civil right (*Skinner v. Oklahoma*, 1942) and the family unit has protection in both the Due Process Clause of the Fourteenth Amendment, and the Equal Protection Clause of the Fourteenth Amendment (*Meyer v. Nebraska*, 1923; *Skinner v. Oklahoma*, 1942). *Stanley v. Illinois* upheld the previous rulings in 1972 (p. 651). Thus, infertility not only affects 22% of women age 18-44 and 7.5% of men, it has also been designated as a liberty provided to citizens of the United States.

For the purposes of this study, infertility will be operationally defined as a disease that affects male or female patients’ reproductive system, rendering the female unable to conceive a child or carry a pregnancy to term after 12 months or more of trying to conceive without success. For women over the age of 35, the time attempting to conceive with success is reduced to six months (Resolve.org, 2011). There are over 90 different codes related to the specific type of infertility diagnosis (Advanced Reproductive Care, Inc. [Arc], 2011) as evidence that there are many different types of infertility disease. Infertility is currently recognized by the American Society for Reproductive Medicine (2011), the American College of Obstetricians and Gynecologists (2011), American Pregnancy Association (APA; 2007), and the World Health Organization (2010). To address this disease, there are specialists, reproductive endocrinologists, and urologists who assist female patients and their partners in diagnosing and treating the disease of infertility.
According to Resolve.org, The National Infertility Association, infertility affects approximately 10% of the U.S. population. Resolve was established in 1974, as a non-profit organization and is the only nationwide network, which promotes reproductive health (Resolve.org, 2011). As a member of the National Coalition for Oversight of Assisted Reproductive Technologies (NCOART), the National Health Council and founding member of the International Federation of Infertility Patient Associations (IFIPA), Resolve is the leading infertility organization in the United States (Resolve.org).

Infertility affects individuals from all socioeconomic levels, ethnicities, and religions. In 2002, the National Survey of Family Growth reported that 22% of women ages 15-44 in the U.S. are infertile or are fecundity impaired (Chandra et al., 2005). More specifically, over 7.3 million women and 3.3-4.7 million men are considered to be infertile. This means that one in eight couples of childbearing age, or over 11 million Americans are infertile and are unable to conceive without assisted reproduction (Chandra et al., 2005). Other research indicates that up to 15% of all couples may possibly experience infertility (Watkins & Baldo, 2004). The number of individuals and couples dealing with infertility has continued to increase consistently in the past two decades (Chandra et al., 2005; Watkins & Baldo, 2004).

Throughout the last decade, research scholars, and clinicians have increasingly become interested in patient perspectives on healthcare. Meeting and fulfilling patient needs and expectations have been found to increase satisfaction (Kravitz, 2001). Patient satisfaction is associated with achieving a desired outcome of healthcare interactions.
Satisfaction surveys are used in healthcare to gauge the success of treatments (Hudak, McKeever, & Wright, 2004). It is the patients’ communication experience and their satisfaction and anxiety levels that this study aimed to review in-depth to improve doctor patient communication.
Chapter 2

LITERATURE REVIEW

Patients’ Experiences with Infertility

The experience of being unable to conceive a child can have a profound effect on an individual’s self-esteem and personal relationships (Fidler & Bernstein, 1999). Fertility expert, Dr. Lay Leng Tan (2004) states, “Infertility is a universal problem” (p. 16). Infertility treatment can strain interpersonal relationships and patients have expressed the need for psychosocial healthcare (Schmidt et al., 2003).

Infertility has a psychological impact on the well-being of couples (Guerra, Liobra, Veiga, & Barri, 1998) and can be accompanied by emotional stress, including anxiety (Mahlstedt, 1985). For women, infertility is more stressful than for men (Greil, 1997). A study of 370 infertility patients showed that 86.8% of female infertility patients had anxiety about their condition (Ramezanzadeh et al., 2004). The study concluded that attention to infertility patients psychologically is of great importance and will improve the quality of their lives (Ramezanzadeh et al., 2004).

Research has also identified non-biological effects of infertility. According to Watkins and Baldo (2004), complexities infertile women and men experience can include numerous factors, such as biological, psychological, and the sociological effects. Numerous studies have found that women need and seek support from many different outlets (Sabourin, Wright, Duchesne, & Belisle, 1991; Schmidt, 1998). The studies also
identified that doctors fail their patients in the quantity and quality of emotional support needed during infertility treatment.

Often non-biological issues that patients experience are not a topic discussed openly with friends and family members. Friends and family members who have not personally experienced infertility often lack understanding (Callan & Hennessey, 1989; Daniluk, 2001). Patients often seek comfort and support in talking to others or by doing their own research on their diagnosis as an effective way to reduce anxiety (Butler & Koralesski, 1990; Gibson & Myers, 2002; McDaniel, Hepworth, & Doherty, 1992; Stanton, Tennen, Affleck, & Mendola, 1992; Williams, Bischoff, & Ludes, 1992).

With infertility, fear of the unknown and uncertainty are constants, which can lead to higher levels of tension between doctors and patients (Calnan, 1988; Denny, 1996). Schmidt (1998) suggests that, on the whole, public health care does not provide adequate information for couples dealing with infertility. The information deficiencies include lack of emotional support, lack of a clear plan for the future, and limited or no written information from specialists (Sabourin et al., 1991).

The Psychological Experience of Infertility

The psychosocial component of infertility has been assessed in previous studies (Lemmens et al., 2004; Schmidt, 2006; Souter, Penney, Hopton, & Templeton, 1998; Sundby, Olsen, & Schei, 1994). Counseling for emotional distress related to infertility and treatment has been recommended. One study identified infertility as, “A diagnosis that causes serious strains on interpersonal relationships, personal distress, reduced self-
esteem, and a chronic stressor to cope with” (Schmidt, 2006, p. 379). Schmidt confirmed that women are overall, satisfied with infertility treatment, but especially need patient-centered care during treatment. Health care has started to evolve away from a disease-centered model of care and toward patient-centered care. Patient-centered care provides patients the opportunity to be an active participant in their health care to receive treatment and service that is focused on their individual needs (Stanton, 2002).

Patient-centered care empowers the patient. By meeting the needs of the individual patient, patient-centered care leads to improved doctor-patient communication, patient empowerment, improved access to health care information and improved quality of care (Agency for Healthcare Research and Quality [AHRQ], 2001). Patient centered care during infertility treatments can help identify when patients need ancillary emotional support. Thoughts and feelings about infertility can be addressed when “Psychosocial counseling was recommended to help patients cope with the anxiety, depression and interpersonal functioning” (Schmidt, 2006, p. 380).

Research shows patients desire a more patient centered approach than is currently provided. A study on the quality of infertility experience asked participants about how they thought the infertility experience could be improved (Redshaw, Hockley, & Davidson, 2007). The answers included, “Infertility is like going into a dark tunnel. You have no idea where you were going or how long it would take. There is uncertainty, longing and submission” (Redshaw et al., p. 298). Patients emphasized planning as the key to managing expectations and acknowledged their lack of control throughout the
process. The women also indicated that they “became consumed and distressed” during treatment (Redshaw et al., p. 298). A significant finding was that the women agreed that infertility was much more a psychological and emotional pain that was stressful, as opposed to an actual physical pain. In general, the participants found health care givers to be supportive. However, the women also found some caregivers to be intimidating, dismissive, and insensitive, thereby increasing their feelings of anxiety (Redshaw et al., 2007). Thus, there is a heightened need for communication between doctor and patient during infertility treatments.

Anxiety and Stress in Diagnosis

Other health conditions or diagnoses show the importance of quality doctor-patient communication. Patients have been characterized as stressed and anxious when informed of their diagnosis with an uncertain future (Herr, 1997).

Infertility patients are confronted with the same uncertainty during their initial diagnosis and testing which then continues throughout treatment. One study examined the effectiveness of doctor-patient communication. The study evaluated whether there was a correlation between online information gathering and the doctor patient relationship, and whether there was a relationship between being a well-informed patient and levels of communication satisfaction (Cegala et al., 2008). The study results indicated a majority of participants were satisfied with the quality of communication with their doctors. However, 37.8% of respondents scored below the mean of 3.95 on a scale ranging from 1 to 5. The results find a significant percentage of participants were less
than satisfied with the communication with their doctors. With over 37% of the participants reporting their level of satisfaction below the mean, the study concluded that additional skills training in patient communication could be beneficial (Cegala et al., 2008).

Another study (Verhaak, Smeenk, Minnen, Kremer, & Kraaimaat, 2005) asked participants to rate their anxiety levels before, during, and after infertility treatment. The study measured anxiety and depression. A significant outcome of the study was that there was a lack of emotional recovery six months after all treatments concluded. The study concluded that, “The high percentage of women who displayed subclinical forms of anxiety and depression six months after the final treatment was clinically important” (p. 2258). Therefore, the quality of doctor-patient communication patterns during the process of infertility treatments, are vitally important to a patient’s psychological health and well-being.

*Communication and Patient Satisfaction*

For over 40 years, research has been conducted on physicians’ communication styles. Research scholars and clinicians have become increasingly interested in patient perspectives on healthcare, including satisfaction levels. Because patient satisfaction has been tied with compliance and, ultimately, health outcomes, communication satisfaction is important to study. Finding ways to meet and fulfill the needs and expectations of patients has been shown to increase satisfaction (Kravitz, 2001).
Studies have found associations between patient-centered communication and patient satisfaction. The research shows that patient involvement in their personal health care can improve patient satisfaction (Jeppson & Thomas, 1994; PBS.org, n.d.). Doctors’ communication skills have also been assessed. Research suggests that a lack of doctor communication and interpersonal skills are significant causes of patient dissatisfaction during medical treatment (Meredith, 1993). Fitzpatrick (1993) supports this concept and found that patient satisfaction is higher when doctors have good interpersonal skills and empathy.

A study of infertility patients measured patient satisfaction levels. The study found that information received from their doctor had a lower satisfaction level than overall patient satisfaction levels (Sundby et al., 1994). The study concluded that a good relationship with doctors was the most important aspect of patients’ positive experiences. A good relationship was defined as the doctors’ personality, manner for care, and communication. In addition, women reported that the most important issue was face-to-face interaction.

In another study, it was suggested, “A good physician knew how to listen and had time for the woman; allowing contact anytime and even at home” (Malin, Hemminki, Raikkonen, Sihvo, & Perala, 2001, p. 128). One participant stated that empathy, good explanations, great details, listening, offering alternatives, and chatting about general life were important in her overall satisfaction. Less desirable communication patterns were identified such as the doctor explaining things poorly, light conversation activity, and
doctors’ rudeness. In contrast to other patient satisfaction studies that show approximately 80% of patients are satisfied, this study found that only 45% of patients were satisfied thereby, emphasizing the need for good communication skills.

The way in which care was given is important as well. It was hypothesized that patients may try to hide their anxiety, stress, and dissatisfaction in an attempt to present themselves positively during treatment (Malin et al., 2001). In 2003, a study, again, found that overall satisfaction levels of infertility patients were high (Schmidt et al., 2003). However, the study revealed that a majority of participants rated communication with their doctors’ satisfaction levels as low. Similarly, another study identified that significant gaps and deficiencies exist in doctor-patient communication (Souter et al., 1998). According to this study, communication was one of two characteristics ranked by patients as needing the most improvement. Patients expressed a desire and a need for communication with their doctor to be more patient-centered, including receiving written information regarding discharge instructions, return appointments, follow-up, and ongoing care (PBS.org, n.d.).

Of the two characteristics of treatment ranked as most significant was information (Souter et al., 1998). The study specifically identified questions about inadequacies in service provided by the infertility clinic physicians. In this study, as few as 30% of participants were given written information, and 78% of participants expressed a need for more written information (Souter et al., 1998). Patients had a desire and need for better treatment and for communication to be more patient-centered (Souter et al., 1998).
Braddock and Snyder (2005) found effective communication, listening, and information received were key to the doctor-patient relationship. Based on these findings, it can be suggested that communication is essential and necessary for a strong doctor-patient relationship. Key patient-centered communication concepts included, “adequate time, having a therapeutic relationship, rapport, acknowledgement, empathy, psychosocial concerns, and eliciting patient questions” (Braddock & Snyder, 2005, p. 1058).

Patient satisfaction has consistently been linked to the interpersonal relationship with their doctor (Buller & Buller, 1987). Low satisfaction levels were found in doctor patient relationships in which the doctor was authoritative and dominant (Simpson, Buckman, Stewart, Maguire, Lipkin, Novack, & Till, 1991). Instead, patients desired warmth, active listening and explanations from their doctors (Li, Desroches, Yum, Koehn, & Deagle, 2007).

A study aimed at evaluating patient satisfaction during infertility concluded that 87% of patients were satisfied with the care they received (Souter et al., 1998). The study found that 86% of participants reported they were not supported emotionally, 47% were not given a clear plan, only one-third of participants had been provided with written information about their treatment plan and 78% expressed a desire for more written information (Souter et al., 1998). At the time the study was conducted, it was the first and only survey of infertile women and their satisfaction levels during treatment. The
study concluded that the two most significant findings reported by participants were information and explanations provided by the doctor, and the doctors’ attitude.

Another study assessed satisfaction levels of infertility patients to evaluate patient-centered care. The study hypothesized that stress directly related to infertility was correlated with lower patient satisfaction levels (Schmidt et al., 2003). The study findings concurred that high satisfaction was associated with patient-centered care (Schmidt et al., 2003).

In 2007, a qualitative discourse analysis was conducted to assess doctor patient communication. The goal was to better understand the associations between doctors’ communication patterns and overall patient satisfaction levels. Patient consultations were audio taped and patient satisfaction surveys were then distributed following the consultations. The study found that the physicians controlled the conversations and asked mostly closed-ended questions, while patients asked open-ended questions. The study concluded that the doctors retained control of the relationship and that patient satisfaction was indeed inversely related to communication with their doctors (Li et al., 2007). The more control doctors had in the doctor-patient communication pattern, the less satisfied patients were. Therefore, doctor-patient communication significantly affects satisfaction levels in patients.

Due to the increasing number of women being treated for infertility, a study (Leite, Makuch, Petta, & Morais, 2005) was conducted on communication satisfaction during infertility treatment. The Patient Satisfaction Questionnaire was applied to the
study to measure satisfaction of communication. The study concluded that, more so than in other specialty clinics, infertility doctors and staff need to be able to communicate with the patients by “actively eliciting patients’ point of view, listen to them, help them to express themselves openly and ask questions” (Leite et al., 2005, p. 39). Women’s satisfaction ratings were evaluated by examining doctor communication. However, no questions were asked with regard to satisfaction levels of communication outside of face-to-face interactions.

Fertility clinics conduct their own satisfaction studies as well. To name a few, the San Diego Fertility Center (2011), Shady Grove Fertility Clinic (2009), and South Jersey Fertility Center (2011) all have patient satisfaction surveys available online. Although the clinics are well intentioned, they asked questions that do not relate to doctor-patient communication. For example, the South Jersey Fertility Center asks patients 68 questions. However, a mere 13 questions relate to communication in any manner. The survey questions themselves are focused on a single treatment or an interaction with the doctor, and the questions do not provide a comprehensive evaluation of satisfaction with doctor-patient communication. Of the three clinics mentioned above, the San Diego Fertility Clinic is the only survey that asked a specific question about communication in the patients overall experience and also asked questions about the doctor’s empathy. In reviewing the questions asked by the three infertility clinic patient satisfaction surveys, a noteworthy oversight found was that none of the surveys included questions related to electronic communication. To summarize, patient satisfaction among fertility patients
has been studied meticulously, but little is known about the effects of electronic communication with doctors and its effects on patient satisfaction and anxiety.

E-Mediated Communication

Patients’ need for emotional support requires that scholars be conscience of where women turn to during treatment. Perreault (2001) was one of the first scholars to ask the question of where women find this support. The study findings showed that women utilized the Internet as a resource during treatment. Perreault continued by asking additional questions of why women use the Internet. The data suggested, “Women seek high interactivity online, and they are oriented toward practical tools, sound advice, and emotional relief from personal and caregiver concerns” (Perreault, 2001, p. 61). It can be suggested that the Internet is the one safe space available 24 hours a day, seven days a week. This makes the Internet a vital tool for women who have been diagnosed with infertility.

There is a crucial need for increased doctor-patient communication using computer-mediated communication, especially considering the decrease in face-to-face communication opportunities between patients and doctors. Anand, Feldman, Geller, Bisbee, and Bauchner (2005) found that because doctor-patient electronic communication has not occurred on a large scale, “The opportunity still exists for patients, physicians, and software engineers to evaluate the impact that the technology will have on health care” (p. 499).
The Internet and Mediated Communication

Bargh and McKenna (2004) have stated, “The Internet is the latest in a series of technological breakthroughs in interpersonal communication” (p. 573). The data supports the idea that the Internet provides innovative and novel opportunities that allow users to communicate with others who have similar interests (Bargh & McKenna, 2004). This suggests that women can use the Internet as a tool to communicate openly, talk about their struggles and triumphs, and support one another by collecting and sharing information.

When using the Internet to communicate, the term Computer Mediated Communication (CMC) is used regularly to describe the phenomena. CMC may include E-mail, blogs, chat rooms, webcams and more (Jacko & Sears, 2003). CMC allows patients to communicate with their physicians through E-mail, video conferencing, and provides access to online medical records.

One of the early researchers of health-related CMC reviewed several health conditions in their study and argues that because of self-esteem, anxiety, and uncertainty, patients feel motivated to seek advice and support online (Davison, Pennebaker, & Dickerson, 2000). Another study established that Internet based communication was preferred over phone calls by patients. The study found over 88% of participants found it easy to use and 85% were satisfied communicating through the Internet. The study concluded there is a high demand by patients to communicate with their doctor through E-mail (Liederman & Morefield, 2003). Today, using E-mail and online access to medical information
continues to increase (Moyer, Stern, Katz, & Fendrick, 1999). In the U.S., 75% of adults use the Internet, and 59% of adults use the Internet to gain health information (Fox & Jones, 2009). LaCoursiere (2001) stated, “The ever increasing availability of the world wide web and online services has propelled major changes in access to health care information” (p. 60). Based on these studies, it can be concluded that CMC research is an area of concentration to study doctor-patient interactions (Jacko & Sears, 2003).

“The Internet has become a natural part of everyday life. This is because new electronic technologies deal with the very essence of human society: communication between people” (Manasian, 2003, p. 4). Several scholars find that the single most significant reason individuals use the Internet is to communicate with others and to develop or maintain interpersonal relationships (Howard, Rainie, & Jones, 2001). One type of interpersonal relationship is the virtual health community, or online patient networks specific to types of disease. Bargh and McKenna (2004) concluded that health and illness are one of the predominant types of CMC. In fact, today, the Internet serves as the primary source for patients coping with illness to gather information. The Pew Internet and American Life Project (Fox & Rainie, 2002) confirmed that 73 million Americans have used the Internet to gain health-related information. The Pew study (Fox & Rainie, 2002) also found that a majority of individuals use the Internet to gather information in order to make health decisions.
One of the founding researchers of health-related CMC reviewed several health conditions and argued that because of self-esteem, anxiety, and uncertainty, patients feel motivated to seek advice and support online (Davison et al., 2000). A study by Broom (2005) examined the impact of Internet use on disease experience and the doctor-patient relationship. CMC was a significant resource to patients (Broom, 2005). The Internet can provide empowerment to patients and shifts the traditional doctor-patient power that directly relates to significantly higher levels of patient satisfaction (Broom, 2005). Broom argued that because of patient empowerment from the Internet and the influence of the Internet on health care, the Internet has become a significant component of the doctor-patient relationship. Based on these findings, it can be suggested that the Internet is a technological advancement in communication that has the power to increase patient satisfaction.

Patients seek information about their medical conditions online. Individuals now more than ever look to the Internet to collect and gather data relating to their medical diagnoses (Rice & Katz, 2001). A study examined how the Internet has changed the way women deal with infertility. Women who feel lonely during infertility treatment can gather information and support online. “Continued improvements in online resources will only improve the ability of women dealing with infertility to improve their knowledge of the condition and find the support they need to cope with it” (Kahlor & Mackert, 2009, p. 90). The doctor-patient relationship has transformed due to patients’
access to information online. The patients’ increased knowledge directly affects the exchange of information between patients and doctors about treatment thereby potentially improving doctor-patient communication.

**The Doctor-Patient Relationship and the Internet**

Rice and Katz (2001) concluded that there is evidence of significant underuse of the Internet when it comes to doctor-patient communication in healthcare. In one study, 85% of patients thought E-mail communication with their doctor would be good (Neill, Mainous, Clark, & Hagen, 1994). While doctors and patients have access and the ability to use the Internet to communicate, they are not using electronic communication to its full potential. Results from another study confirmed multiple factors about E-mail communication between doctors and patients. The study found “Patients perceive E-mail communication as offering increased speed, convenience, and access to medical care” (Anand et al., 2005, p. 1517). The majority of patients who used E-mail to communicate with their doctor were satisfied with this method of communication. CMC is, therefore, a vast research arena within the communications field, providing new research on interpersonal interaction (Jacko & Sears, 2003). Another study aimed to improve doctor-patient communication throughout all medical fields was conducted by Kaiser Permanente. The study found that E-mail between doctor and patients improved care. E-mail allowed patients to let doctors know of changes in their condition, ask about lab results and inquire about drug dosages (Baer, 2011). In a study conducted in Norway, nearly half of the population wanted to be able to communicate with their doctor through
Information and Communication Technology (ICT) (Andreassen, Sandaune, Gammon, & Hjortdahl, 2002). Within CMC, the term Information and Communication Technology (ICT) relates directly to a noteworthy change in doctor-patient communication.

E-mail provides flexibility for patients to communicate when they have time, when they think of something important and to know they have sent the information. Communicating in a way the patient desires helps to build trust. The level of trust in the doctor-patient relationship can reduce stress and anxiety in the patient (Andreassen, Trondsen, Kummervold, Gammon, & Hjortdahl, 2006).

Internet-based communication technology is a field that is growing substantially. It seems that every day new tools or websites are developed to provide comprehensive ways for patients to access their health records or communicate with their doctors’ offices. A study about E-mediated communication found that patients initiate contact with their doctors’ office. An example provided in the study highlights a single mom who physically cannot get to the doctors’ office during normal operating hours and her ability to utilize the Internet to access medical records or make an appointment is convenient and efficient (Andreassen et al., 2006). In other words, it makes following through with medical care a possibility, rather than a choice.

Another aspect the study found was that e-mediated communication has lowered the threshold for patients by providing another form of communication. Those who might have been afraid to ask a question or were uncomfortable in a face-to-face interaction can now ask questions through E-mail. This reaffirms other study findings
(Kummervold et al., 2002) in which 75% of participants admitted it was easier to talk about their personal issues online instead of face-to-face. Another element of the study was that the asynchronous nature of the E-mail communication allowed for doctors to respond at their convenience. As a result, doctors would be more likely to use it. In addition, the study found that in general some patients prefer to communicate in writing rather than verbally. E-communication requires that patients think about their questions. One patient commented, “I feel calmer when I know I have sent an E-mail, and know that an answer will be coming. Then, it’s like I feel more calm than worried. I have got it off my mind” (Andreassen et al., 2006, p. 244). Overall, the findings support the notion that patients’ anxiety levels can decrease when using e-mediated communicating with their doctors.

Scholars have found that CMC actually has many of the same characteristics and effects that are found in face-to-face communication (Jacko & Sears, 2003). A technology assessment, *Bridging the Electronic Divide: Patient and Provider Perspectives on E-mail Communication in Primary Care*, Moyer et al. (2002) conducted a study to look at both patient and doctor perspectives on the use of E-mail communication. The results indicate that over half of the patients defined themselves as E-mail users, and yet only 10% of patients use E-mail to communicate with their primary care provider. This means out of almost 250 patients surveyed that use E-mail, only 25 use E-mail as a communication medium with their doctors. With such a low number of patients actually using E-mail as a way to communicate with their doctor, the following
question was raised: How many patients would be willing to use E-mail if it was available to communicate with their doctors? Of the patients surveyed, 70% reported that they wanted to use E-mail to communicate with their doctors (Moyer et al., 2002). Another important finding of this study indicates that women represent 59.5% of those participants using E-mail.

Moyer et al. (2002) also found that “E-mail has the potential to improve both the quality and efficiency of healthcare service delivery” (p. 427). Online communication maintains doctor-patient interpersonal relationships, improves the exchange of information, lowers the threshold, and allows for better decision making (Ha & Longnecker, 2010; Parker-Pope, 2008; Zamosky, 2010). Research indicates that though in the last decade the use of E-mail between doctors and patients is increasing, the growth is much slower than what it could be based on the current use of technology and the Internet for all types of communication. It is estimated that over 85 million individuals use the Internet every day and that 80 million individuals are interested in having online communication with their doctors (Dominick, 2011; Parker-Pope, 2008; Zamosky, 2010). According to Mandl, Kohane, and Brandt (1998), electronic communication between doctors and patients offers an opportunity for better communication. Linking patients and physicians through E-mail may increase the involvement of patients in their own health care and may contribute to improved health” (Mandl et al., 1998, p. 495). The study also addressed the barriers that exist between doctors and patients. These barriers included difficulty to reach the physician, and unlike telephone conversations that require
same time availability of patients and doctors, E-mail offers asynchronous mode of
communication, which they believe provides continuous access to health care” (p. 497).
Patients in a Harris Interactive study (2002) supported paying for access to their doctors.
One study primarily looked at parents’ communication with their children’s doctors. Of
the parents who used E-mail to communicate with their children’s doctor, the majority
overwhelming supported the use of E-mail (Anand et al., 2005).

A recent survey (Wong, Tan, & Drossman, 2010) addressed key issues in the ‘E-
mail Era’ of doctor-patient communication. From the patients’ perspective,
“Technological advances in communication have led to an explosion of health-resource
websites on the Internet. These resources include blogs, healthcare portals, and
interactive websites. The results from this study indicate that “Patients desire more
electronic communication with their doctors” (Wong et al., 2010, p. 663). In fact, a
Harris Interactive Healthcare poll (2002) showed up to 90% of Americans who use the
Internet would like E-mail communication available with their doctors, and over 80%
wanted their doctors available through E-mail following a visit (Leitman, 2002).

In the past ten years interest in using E-mail and the Internet to access medical
information has increased (Moyer et al., 1999). The results of another study (Leong,
Gingrich, Lewis, Mauger, & George, 2005) confirmed multiple elements of E-mail
communication between doctors and patients. The results showed “Patients perceive E-
mail communication as offering increased speed, convenience, and access to medical
care, the majority of patients who do use E-mail to communicate with their doctor are
satisfied with this method of communication, reading and responding to E-mails does not appear to be overly time consuming for physicians, and E-mail is used for non-urgent problems such as refilling prescriptions, communicating lab results, and making appointments” (Anand et al., 2005, p. 1517). Therefore, electronic communication between doctor and patient has the potential to improve the doctor-patient relationship.

The Problem

The Internet, which as noted previously provides multiple forms of (CMC), can be a main source of support for women dealing with infertility (Jacko & Sears, 2003). Although the Internet and CMC is widely available to all doctors, as few as 5% of physicians regularly use the Internet to communicate and provide information to their patients (Mandl et al., 1998).

In a study, four physicians offered E-mail to their patients and four physicians did not offer E-mail (control group) (Leong et al., 2005). The results of the study show that patient satisfaction significantly increased in the E-mail group compared with the control group in the areas of convenience. When asked if patients should be able to E-mail their physicians, most patients in the E-mail group and all but two of the physicians in the non–E-mail group responded, “Yes” (Leong et al., 2005, p. 180).

Effective communication is mutually beneficial to the doctor-patient relationship. Technological advances have historically changed the way in which we communicate in interpersonal relationships. Similarly to 1876 with the invention of the telephone, E-mail
is revolutionizing the doctor-patient relationship through new technology (Leong et al., 2005).

Over 15 years ago, a study found that 85% of patients thought E-mail communication with their doctor would be good (Neill et al., 1994). Another study surveyed almost 50% of patients at two large primary care centers. The results confirmed that only 10.5% of patients use E-mail to communicate with their doctors (Moyer et al., 2002). However, 70% of the participants wanted to use E-mail to communicate with their doctors.

With the explosion of the number of Internet users and the increase of women dealing with infertility in the past decade, LaCoursiere (2001) revealed that women, use the Internet because they seek interactivity online. Women want practical and sound advice, and timely emotional relief. The Internet provides a useful tool women desire.

Theoretical Framework

As with most research on newer phenomena, communication scholars often turn to communication theories created to explain traditional media. Media Richness Theory (MRT) is used to evaluate information processing and communication effectiveness. The theory makes two assumptions related to uncertainty and equivocality (Daft & Lengel, 1986). Uncertainty is defined as having mistrust, doubts or reservations. Ambiguity is defined as the ability to have more than one interpretation of a concept or interaction. Both uncertainty and ambiguity have a direct effect on understanding.
Uncertainty relates to this study due to the amount of information the patient has been provided by the doctor. Equivocality relates to this study because of the ambiguity and misinterpretations while communicating. MRT says that if equivocality is high, individuals are not capable of knowing what questions to ask. MRT also says that when uncertainty is high, the individual understands the questions to ask, but still lacks necessary information. Therefore, MRT states that as information increases, uncertainty and equivocality decrease.

The second assumption of MRT relates to how tasks work better under different contexts. The channel in which communication is sent changes the way in which the receiver responds. MRT concludes there are four media classifications in which communication can take place: face-to-face, telephone, addressed documents, and unaddressed documents (Daft & Lengel, 1984; Daft, Lengel, & Trevino, 1987). The richness of the communication is based on feedback, multiple cues, language variety, and personal focus. MRT contends that the richest form of communication is face-to-face because only face-to-face communication is capable of resolving both uncertainty and ambiguity. Following face-to-face as the richest media, in descending order of richness; telephone is second and E-mail is the third richest (Rice & Shook, 1990).

MRT applies as a theoretical mechanism because of the research questions posed about forms of communication. The study will specifically evaluate the quality of communication in all forms identified by MRT. Using MRT will provide an explanatory mechanism for how individuals prefer to communicate and through which medium. The
vast library of research on infertility, communication, CMC, and patient satisfaction levels leads directly to the research questions.

Research Questions

RQ1: How is a patient’s satisfaction level affected when they utilize computer-mediated communication as a tool to communicate with their doctors during treatment?

RQ2: How is a patient’s anxiety level affected when they utilize computer-mediated communication as a tool to communicate with their doctors during treatment?

RQ3: How satisfied are current infertility patients with all forms of communication with their physicians?

RQ4: How satisfied are previous infertility patients with all forms of communication with their physicians?

This study explored a possible gap in doctor patient communication. Doctor-patient communication has been studied and patient satisfaction of infertility clinics has been examined. However, the use of CMC with infertility patients has not been fully investigated as well as its effect on patient satisfaction and anxiety levels are not well understood. This study sought to address these research areas.
Chapter 3

METHOD

Design

This study utilized an online survey incorporating both quantitative and qualitative measures to assess satisfaction and anxiety levels related to communication between doctors and patients during infertility treatment. The study was conducted online over a six-month time period with previous and current patients of Northern California Fertility Medical Clinic (NCFMC) in Roseville, California.

The infertility treatment center, NCFMC, was established in 1992 and owned by three Board certified reproductive endocrinology specialists, and has an experienced team of embryologists, nurses, medical assistants, and administrative personnel. Additionally, a physician specializing in the area of male infertility is available for consultation. NCFMC offers the largest IVF program in the Sacramento region, and they are open for treatment 365 days a year to support patients’ cycle needs. Patients of NCFMC are given the option of communicating with their physicians through both traditional face-to-face communication and through computer-mediated communication (CMC) to access medical records and correspond directly with their doctor through E-mail. All the doctors personal business cards have their E-mail address listed and the doctors personally read and respond to patient E-mails.

The researcher was introduced to NCFMC in November 2007 as a patient, and a doctor-patient relationship was established. The researcher approached the physician-
owners of the clinic in December 2009 (14 months after treatment ended) about the possibility of a study. All communication related to the proposed study was initially conducted through E-mail with multiple physician partners. A meeting between the researcher and the physician owners was set for April 2010 to discuss additional study details. Unanimous consent was provided by the three physician owners for the study to proceed. Upon successful completion of a pre-proposal meeting with the researcher’s thesis committee, the revised pre-proposal was sent to Dr. Andreyko, a physician owner, for review. The pre-proposal was approved by the clinic in May 2010.

All survey questions were submitted to the California State University, Sacramento Human Subjects committee and Communication studies committee for approval. Approval for the survey was received in April 2011 and the survey questions were sent to NCFMC for final review. Upon review, the physician owners made requests for minor changes to the survey questions. The final survey incorporated the changes requested by the clinic and was administered beginning in July 2011. Participation in the study was voluntary and anonymous, complying with all HIPPA regulations. Identical questionnaires were distributed to all participants.

Procedure

Participants were recruited to participate in an online survey about communicating with their doctors and anxiety levels during infertility treatments. Recruitment was conducted using flyers (see Appendix A) in the NCFMC clinic, word of mouth from nurses and staff members at NCFMC, from local Resolve.org members, and
using the NCFMC Facebook page. The clinic was provided with 200 flyers approved by both Human Subjects and University Marketing in July 2011. The flyers were placed in the infertility clinic lobby, the exam rooms, and in the nurse’s offices for six months, beginning July 2011 and ending January 2012. The nurses were instructed by the physician owners to invite all patients to participate in the study. As an additional recruitment measure, the researcher contacted the leader of the three Resolve groups in the Sacramento and Placer regions and encouraged the leader to invite members to participate in the study. The local Resolve leader sent the link to the survey to members of the group who were current NCFMC patients. The E-mail was sent to potential participants with a brief introduction about the study and a direct hyperlink to the online survey website (Survey Monkey).

In October 2011, slight modifications were made to the recruitment procedures. It was found that the link to the study was lengthy and it could benefit the study sample size if a shorter website URL was used. Therefore, the www.ncfmcstudy.com domain was purchased by the researcher, and a link to the Survey Monkey survey was enabled. The nurses at NCFMC added the link in their signature line of E-mails after the website was created. The clinic administrator added information about the study to the clinic’s website www.ncfmc.com. Dr. Murray, a physician owner, who manages the NCFMC Facebook page, posted an introduction to the study and the link to the survey on the clinic’s Facebook page. In November 2011, members of the Sacramento Resolve group who were previously treated at NCFMC and have successfully become pregnant, left the
clinic, or who have adopted children were invited to participate in the study. The members of the local Resolve group were encouraged to send the survey to any current or previous NCFMC patients that may not be members of the Resolve groups. Communication regarding the study process and timeline was provided to NCFMC on a monthly basis through E-mail.

Participants

The study included 53 women ranging in age between 21 and 44 years of age who were currently being treated or who had been treated for infertility at NCFMC. The mean age was 35.37 (SD=4.82). The number of months trying to conceive a child ranged from 6 to 120. The mean was 42.45 (SD=27.56). Participants had sought medical treatment for infertility for 3-84 months. The mean was 23.67 (SD=18.19).

All previous and current patients of NCFMC had the option to communicate with their doctors electronically using CMC and had direct access to every doctor through E-mail. Patients also had access to their personal medical records online using a patient portal providing them with the ability to make appointments and check test results online.

Measures

Using two types of questions, the study provides a comprehensive analysis of the Satisfaction and Anxiety levels of the patients related directly to their communication with their doctors. Patients provided specific details about their communication experiences. There were 54 questions included in the survey instrument. One question
required an answer (consent to participate). All other questions were answered at the discretion of the participants.

To measure Satisfaction, a modified Patient Satisfaction Survey (PSS) was used as the basis for measuring the data. The PSS is a multi-dimensional measure of patient satisfaction (Hudak & Wright, 2000). The researcher modified the PSS to address infertility patient concerns for use in this study. The PSS survey used measures shown to be reliable that could provide insight into patients' perceptions of the quality of care and treatment. The survey included 53 questions to measure each of the variables – satisfaction, anxiety, previous patients, and current patients (see Appendix B). The final survey instrument for the study included a total of 54 questions, including consent to participate.

To measure E-mail Satisfaction, three Likert-type items ranging on a scale of one (strongly disagree) to five (strongly agree) were included. Examples include, “I like to use E-mail when communicating with my doctors,” and “Please rate your level of satisfaction with E-mail communication with your doctors.” Detailed results are discussed under the heading Research Question 1. Reliability for this and all other measures are reported in the Results section.

To measure Anxiety, two Likert-type items ranging on a scale of one (strongly disagree) to five (strongly agree) were included. The Anxiety scale included questions, “My anxiety decreases when I send an email directly to my doctors and receive a response from the doctors.” and “My anxiety would increase if I did not have the option
to communicate with my doctors through email.” Detailed results about measure reliability are discussed below in the Results section.

To measure overall communication satisfaction, 13 Likert-type items ranging on a scale of one (strongly disagree) to five (strongly agree) were included. A communication Satisfaction scale was created using the three questions in the E-mail Satisfaction scale and 10 additional Satisfaction questions from the survey. Examples include, “I would be less satisfied if I did not have E-mail available to communicate with my doctors,” “When receiving a message from someone from NCFMC, if you have additional questions, are they generally answered in that conversation,” and “I am satisfied with the quality of my doctor’s responses to my questions.”

Data Analysis

The data were analyzed using the computer program SPSS 18.0. The analysis was conducted by creating an E-mail satisfaction scale, an anxiety scale, and an overall communication scale. The E-mail communication scale was analyzed using a frequency. The anxiety scale was used to analyze anxiety levels of patients related to computer-mediated communication with their doctors. A t-test was used to examine differences between the means of both current and previous patients using the satisfaction scale. In addition, responses to the open-ended questions were analyzed to provide data toward answering the research questions. The research questions aimed to discover the effect of use of E-mail with doctors on patient satisfaction and on patient anxiety as well as how
satisfied both current and previous infertility patients were with all forms of communication with their physicians.
Chapter 4

RESULTS

Research Question 1 (RQ1): How is a patient’s satisfaction level affected when they utilize computer-mediated communication as a tool to communicate with their doctors during treatment?

This question was analyzed using the frequencies of three questions including, “I like to use E-mail when communicating with my doctors,” “I would be less satisfied if I did not have E-mail available to communicate with my doctors,” and “Please rate your level of satisfaction with E-mail communication with your doctors.” An E-mail satisfaction scale created from the three questions showed that the mean E-mail satisfaction scale was 4.21, (SD=.88). Reliability for the E-mail satisfaction scale was $\alpha = .68$. On a scale of 1-5, scores ranged from 2-5, indicating that none of the participants were strongly dissatisfied. The mean was high, indicating great overall satisfaction with E-mail communication. Participants were asked an open-ended question regarding how they would prefer to communicate with their physicians outside the office. Of the 40 participants who answered the question, 27, or 68% of those participants answered, “E-mail.” One participant responded that “E-mail was how they preferred to communicate outside of the office and another participant stated, “E-mail. So I have it in writing.” These examples and the number of participants who expressed their desire to use E-mail shows a pattern in which patients wants to communicate through CMC with their doctors. In fact, 82% of participants who answered this question, indicated they used CMC.
through the patient portal provided by NCFMC, and of those participants who used the portal, 100% of the participants liked using it.

Research Question 2 (RQ2): How is a patient’s anxiety level affected when they utilize computer-mediated communication as a tool to communicate with their doctors during treatment?

To examine the relationship between anxiety levels and the use of computer mediated communication, an overall anxiety scale was correlated with the E-mail satisfaction communication scale. The anxiety scale reliability was $\alpha = .72$. The anxiety scale had a mean of 4.19, ($SD = .84$). As previously mentioned, the E-mail satisfaction scale had a mean of 4.21, ($SD = .88$) and as previously mentioned the reliability was $\alpha = .68$. A statistically significant correlation between the two was found ($r = .53, p = .001$). This means that the higher E-mail satisfaction is the more anxiety levels decrease. Put another way, the lower the E-mail satisfaction, the greater the anxiety.

Participants were also asked open-ended questions such as, “What would help you feel less anxious when communicating with NCFMC?” The participants’ comments included, “More communication between doctors and staff so that all parties are on the same page,” “To know they would get back to me the same day,” and “To know my doctor received my E-mail and would be responding - almost like an auto response.” Hence, computer-mediated communication between doctor and patient could help participants reduce their anxiety about the infertility process. Using E-mail to communicate allows patients’ to take an active role in their treatment through
communication. Therefore, this may boost patients’ self-esteem and communication between doctor and patient would be more patient-centered.

Research Question 3 (RQ3): How satisfied are current infertility patients with all forms of communication with their physicians?

Research Question 4 (RQ4): How satisfied are previous infertility patients with all forms of communication with their physicians?

For RQ3 and RQ4, recall that a communication satisfaction scale was created using 13 Likert-type scale questions from the survey instrument directly related to communication satisfaction. The communication satisfaction scale reliability was $\alpha = .95$.

To examine any differences between the satisfaction means of current and previous patients, a $t$-test was conducted. On a scale of one to five, the mean satisfaction rating of current patients was $M = 4.22$, and the standard deviation was $SD = .74$. The mean satisfaction rating of Previous Patients was $4.20$, ($SD = .93$). The $t$ value was $t = .061$, $ns$. Overall, the results of the $t$-test showed that both current and previous patients had high means, and the means were comparable.

In addition to the quantitative measures, the participants provided answers to open the open ended question, “What would help you to be more satisfied with communication with doctors at NCFMC?” The answers included the following:

“They were more patient with listening and questions.”
“Were more mindful of how sensitive the process is.”
“Responses were quick.”
“We had more time during appointments to discuss the next steps to take notes and ask questions.”
“The doctors could understand that this is a hard and stressful time for each patient, and to be a little more patient and understanding.”
“For them to actually acknowledge my concerns instead of stating reasons why it can't be that problem.”

The participants’ comments regarding improved communication highlight similar concerns that other studies have shown. Emotional support, additional information and mindfulness are all qualities that would help the doctor-patient relationship to be even more patient-centered.

In order to analyze subsets of the results, it was necessary to find the mean and standard deviation for each satisfaction question (see Appendix C). By reviewing individual satisfaction questions and their means, power levels within communication were evaluated. For example, the first meeting with the infertility doctors had high ratings of communication satisfaction. Other forms of communication, such as face-to-face, phone and E-mail were also compared. The results found that face-to-face had the highest mean, followed by E-mail with the second highest mean and phone communication had the lowest mean of the three. Hence, the highest satisfaction levels of communication went from face-to-face, to E-mail, to phone. The results therefore
show that only a portion of the theory of Media Richness applies to this study. Detailed results from each quantitative Likert-type scale satisfaction questions are provided in Appendix C.
Chapter 5

DISCUSSION

The goal of this study was to assess doctor-patient communication with infertility patients at one clinic. In addition to evaluating traditional, face-to-face communication, this study addressed phone, E-mail, and written communication, as well as power within the doctor-patient relationship. The use of computer-mediated communication (CMC) has become of interest as more and more patients express an interest in communicating with their healthcare providers through E-mail (Wong et al., 2010). This study examined the relationship between communication and infertility patients’ anxiety and satisfaction. The discussion includes an analysis of the results and comparisons between communication satisfaction and anxiety, addresses limitations of the study and future research are discussed.

Infertility is a medical condition that continues to be increasingly diagnosed, and the demand for treatment by doctors also has increased (Chandra et al., 2005; Schmidt et al., 2005). While infertility is identified as a medical condition, it has also been determined that healthcare professionals do not provide adequate support for patients when being treated for infertility (Calnan, 1988; Denny, 1996; Mahlstedt, 1985; Schmidt, 1998). An infertility diagnosis comes with emotional stress, fear, anxiety, and uncertainty (Schmidt, 1998). In fact, the psychological well-being of infertility patients is of great importance (Ramezanazadeh et al., 2004).
Reports of women’s experiences in other studies have expressed that the disease is much more a psychological condition, than a physical condition (Schmidt et al., 2005). Studies have concluded the infertility patients desire more information from their doctors, and that a deficiency exists in the quantity of written communication provided by doctors to patients while undergoing infertility treatment (Sabourin et al., 1991; Schmidt, 1998). The literature reviewed indicates communication is an essential part of an effective doctor-patient relationship and meeting the needs of the patients can lead to higher levels of patient satisfaction, thus, more compliance with treatments or doctors order (Kravitz, 2001)?

Despite studies on infertility patient satisfaction have generally showed high levels of satisfaction with treatment, low levels of satisfaction exist with regard to communication. Conversely, the current study found that participants had high levels of satisfaction with the communication between the doctor and patient, with a mean of 4.25 for all forms of communication. Of the 17 questions specific to communication satisfaction rated on a scale of 1-5, the lowest mean was 3.83 indicating relative satisfaction was the lowest. However, when the results were studied closely, key areas of communication were identified as having lower satisfaction levels than the mean of all communication satisfaction.

The results of the current study support findings in other studies in that infertility patients desire more information and more written information on their diagnosis and treatment plan from their doctors. The participants were asked about quantity and quality
of information received from their doctors during treatment. The results showed that the quality of information patients received was not an issue in terms of satisfaction. It was the quantity of information that received lower ratings of satisfaction.

Another conclusion drawn from the results relates to the initial meeting between doctors and patients. Scholars have found that patient-centered care allows for patients to be active during their treatment (Stanton, 2002). Other scholars argued that perceived power differential between doctor and patient plays an integral part of how satisfied a patient is. Power differentials are patient perceptions of the relative ‘distance’ between themselves and the doctor. Patients do not feel empowered when communicating with their doctors when they perceive a large power differential. Lack of empowerment adds to anxiety and also relates to a strained doctor-patient relationship.

Patient-centered care empowers patients; planning has been emphasized as a way to manage patient expectations (Redshaw et al., 2007). Therefore, the initial consultation with a doctor can set the tone for the style of communication between the doctor and patient. Essentially, this first meeting establishes the power in the relationship and determines if the doctor-patient communication will be patient-centered. Other studies found that patients felt doctors were intimidating, dismissive, and insensitive (Redshaw, 2007). The current study showed, high levels of satisfaction were found in the initial meeting with the doctors at NCFMC, suggesting the doctors at NCFMC create a patient-centered consultation.
Face-to-face communication, as seen above in the example of the initial doctor-patient meeting, had the highest level of satisfaction. However, there are many different types of face-to-face communication that affect the power within the doctor-patient relationship and, ultimately, may affect face-to-face communication satisfaction. The satisfaction levels found within this study indicate the power is shared in the doctor-patient relationship at NCFMC, and patients were able to ask questions face-to-face and receive responses from their doctors. Although the study found high levels of overall communication satisfaction, deficiencies and lower levels of communication were identified in this study. While the results show the power is shared, patients indicated that additional communication and needs are still desired.

This study also examined satisfaction levels of different forms of doctor-patient communication; including face-to-face, phone, E-mail, and written communication. The highest levels of satisfaction were found in the initial consultation, face-to-face communication, and the ease with which patients felt they could communicate and ask questions. The results from this study show a clear pattern of the need for patient-centered care. When asked how communication could be improved, the participants expressed the desire for understanding and information. This theme is similar to what other studies on infertility have found in which communication satisfaction was studied during infertility treatment (Leite et al., 2005). The study concluded infertility doctors need to communicate well with patients by listening to them, helping them express themselves openly, and ask questions (Leite et al., 2005).
As expected, face-to-face communication had the highest level of satisfaction compared to both phone and E-mail communication. This concurs with the theory of media richness that the richest medium with the highest bandwidth would be preferred by patients. However, the study results contrasted the theory of media richness in which face-to-face communication would be followed by phone and then E-mail. The study results show E-mail is the preferred form of communication second to face-to-face interaction. This confirms the results of a pilot study that examined E-mail communication between doctors and patients. E-mail was found to be a convenient way to communicate (Leong et al., 2005).

Fertility clinics have conducted their own satisfaction surveys as well (San Diego Fertility Center, 2011; Shady Grove Fertility Clinic, 2009; South Jersey Fertility Center, 2011). In reviewing the questions asked of patients, it was determined the clinics did not ask communication satisfaction questions about the overall experience during treatment. The San Diego Fertility Clinic survey asked questions pertaining to one interaction. Of the survey questions, only 19% of the questions were about communication satisfaction. The current study dedicated all the satisfaction questions to communication and further broke down the communication satisfaction into groupings by type of communication and power within communication.

In a study (Leong et al., 2005), E-mail communication was preferred by the patients as the primary way to communicate with their doctors outside the office, and their communication satisfaction levels with E-mail were higher than the overall
communication satisfaction. Thus, the current study replicates Leong et al.’s findings adding strength to the opinion that patients, especially infertility patients, appreciate and want to use E-mail to communicate with their doctors. The current study not only evaluated communication between doctors and patients, but gave full attention to satisfaction levels in CMC communication, thereby expanding our understanding the role of CMC in infertility patient satisfaction.

Studies have attempted to improve doctor-patient communication in all medical fields. A study by Baer (2011) found that E-mail between doctor and patients improved care. E-mail allowed patients to let doctors know of changes in their condition, ask about lab results, and inquire about drug dosages. Another study found the majority of patients who used E-mail to communicate with their doctor were satisfied with this method of communication (Anand et al., 2005). The current study provides an in-depth analysis of infertility patients and provides a clear indication of their preferences for E-mail communication. E-mail provides a way for patients to communicate with their doctors 24 hours a day. It reduces the patient’s anxiety and it allows them to have a written, documented form of communication. As indicated by the strong satisfaction survey patterns, this is a win-win for the infertility patient during a stressful time.

In the current study, the high overall satisfaction ratings and low anxiety levels are noteworthy as CMC and patient satisfaction continued to be examined. The patient preferences suggest E-mail is the preferred method of communication for multiple reasons. For the patients, having additional information, both regarding the diagnosis and
throughout treatment, is desired, NCFMC utilizes both E-mail and CMC to communicate with their patients. A significant correlation was associated between the use of CMC, E-mail satisfaction and lower levels of anxiety. This study shows a positive correlation to high levels of E-mail satisfaction and low levels of anxiety. The results from this study confirm what some studies show about E-mail satisfaction (Leong et al., 2005).

However, other studies have shown that communication satisfaction levels were low in infertility patients (Sundby et al., 1994). Therefore, this study has contrasted earlier studies on infertility patient satisfaction and confirmed later studies related to infertility patient satisfaction with the use of E-mail. And this study added to the literature by asking if high E-mail satisfaction was related to anxiety. The study showed there is a correlation between these two variables and that as patient satisfaction with E-mail communication satisfaction increases, anxiety levels during infertility treatment decrease.

As discussed in the literature review and the discussion, patient anxiety levels are generally high during infertility due to the unknown factors during treatment. This study examined anxiety related to communication between doctor and patient. The results of the current study showed that high levels of E-mail satisfaction had a positive correlation with lower anxiety levels. Participants indicated they would have higher anxiety if they did not have the ability to use E-mail, and they would have lower levels of anxiety when they sent an E-mail to their doctor. Communicating through E-mail provides patient-centered communication. Therefore, this study suggests anxiety levels in infertility
patients could be reduced through utilizing E-mail communication in the doctor-patient relationship.

Originally, the current study included only current patients at NCFMC. Due to a low response from current patients, previous patients were contacted through the local Resolve community. Comparisons of overall satisfaction ratings between the two groups showed no significant difference in satisfaction levels. The amount of time since previous patients had been treated was not determined and the reason they were no longer patients at NCFMC was not asked so it was not possible to rule out these as potential moderators of patient satisfaction. The Resolve members who participated were either successful in treatments for infertility in that they were pregnant or had a child, had adopted, stopped trying, or had moved to a different clinic. The results suggest that both groups, previous and current patients, were highly satisfied with the communication from the doctors at NCFMC. Both previous and current patients provided answers to the open-ended questions on the survey.

Qualitative measures were used to gauge what participants desired to help the communication with their doctors and patients. A theme emerged from the answers to the question, “What would help you to be more satisfied with communication with doctors at NCFMC?” The theme identified in this study confirms what previous studies have argued. While, the patients in this study were highly satisfied with communication between doctor and patient and had lower levels of anxiety when using E-mail to communicate with their doctors; the participant’s satisfaction levels and comments
showed lower levels of satisfaction related to understanding information and additional emotional support from their infertility doctors. Anxiety, fear and patient-centered communication are essential components of the doctor-patient relationship, and computer-mediated communication is preferred by patients. Therefore, this study concludes that because of anxiety experienced among infertility patients and the need for patient-centered care, E-mail communication between doctor and patients should be used.

Not only does E-mail provide another medium for communication, it reduces anxiety in patients and provides written document for patients to refer back to at a later date. Patients in this study specifically expressed the continued need for understanding and support. Online communication has the ability to improve women’s knowledge of their condition and gain the support they need, reducing anxiety (Kahlor & Mackert, 2009). Increasing the exchange of information between patients and doctors can improve doctor-patient communication and satisfaction levels.

By using E-mail to communicate with patients, doctors are providing patient-centered care and reducing levels of anxiety. The use of E-mail, therefore, impacts the satisfaction levels of the patients. This study instrument can be used to evaluate satisfaction and anxiety levels when assessing communication between patients and doctors in any specialty field or in general practice. This study has added to the literature by asking satisfaction and anxiety questions specifically aimed at communication between doctors and patients throughout treatment.
Limitations

While the study endeavored to accurately evaluate infertility patient satisfaction and anxiety levels related to communication, it is necessary to address several limitations.

The first limitation is the size of the population studied. Using participants from one clinic did not provide a diverse enough sample to generalize the results to other populations. Each fertility clinic is unique, and the personalities of the physicians, style of treatment, and degree of aggressiveness in treating infertility vary by clinic. If more fertility clinics had been included in the study, the results could have been more generalizable. The study was limited to the satisfaction and anxiety levels of information received by patients from six doctors who specialize in assisted reproductive technology.

Another limitation was related to data collection. Recruitment of participants was challenging. Originally only current NCFMC patients were invited to participate in the study. However, the resultant sample size was too small; hence recruitment efforts needed to be adjusted during the study. Therefore, in addition to placing flyers in the patient waiting and exam rooms, and having the nurses distribute flyers to patients, new ways to recruit participants were implemented to overcome the limitations. New recruitment efforts included the purchase of a shorter website domain, which was linked to the Survey Monkey website. This allowed patients and nurses to have easier access to the survey instrument. Although this increased the sample size, the number of participants remained low. Therefore, Previous patients were invited to participate in the study as well.
NCFMC did not allow the recruitment flyer to be mailed to current and previous patients in their database. The researcher had to engage the local RESOLVE group of women to further recruit patients that had been or were being treated at NCFMC and were members of RESOLVE. It is proposed that if all previous and current patients of NCFMC could have been contacted through direct mail, phone or E-mail, the number of participants could have been significantly greater. Increasing the number of participants could have improved the power of the results, as well as improved the reliability of the results.

Another limitation was found in the low reliability of the E-mail satisfaction scale. The reliability is the consistency of the measures and may have contributed to random error. Therefore, this could have affected the survey results. Increased items or sample size may have increased the reliability of the measures.

Future Research

Previous studies on infertility patient satisfaction have illustrated the gaps in information on patient satisfaction levels related to information and communication. This study assessed infertility patients’ levels of communication satisfaction and anxiety. While this study adds to the existing research findings on infertility and satisfaction, as with all studies, it will lead to new questions. Future research could complement this study by expanding on the data collected in numerous ways.

The first expansion would be to include more patients from NCFMC by sending direct mail pieces, conducting phone calls or sending E-mails to previous and current
patents. A second expansion would be to include more infertility clinics within the Sacramento area to compare the communication styles and the results in communication satisfaction and anxiety levels. The study could include correlations between the different clinics, in addition to correlations between E-mail satisfaction and anxiety levels. By implementing these ideas for future studies, it is anticipated that the number of participants would increase. With more clinics and more participants, the results could be more generalizable to infertility clinics throughout the United States and would not be limited to the Sacramento region.

In addition, studying more than one clinic would provide the opportunity to conduct additional measurements and t-tests. The t-tests could compare each clinic’s levels of satisfaction and anxiety related to communication. Specifically, t-tests could be used to evaluate variables in this study and new variables. Having more than one clinic would also provide further studies with a larger sample size. The larger sample size would provide added reliability to the measurements, for higher consistency.

A new measurement could compare the patients’ perceptions of communication satisfaction to the doctors’ perception of patient communication satisfaction. Implementing a simultaneous study of the doctors’ level of perceived patient communication satisfaction would provide data that could be used in future research for training infertility doctors. By identifying the differences in perceptions between doctors and patients, both the doctors and patients would gain insight about the communication
process. Thus, improved interpersonal communication between doctor and patient could be achieved.

With the number of individuals needing infertility treatments increasing and the number of clinics and physicians specializing in reproductive health increasing annually, studies related to doctor-patient communication and satisfaction and anxiety levels will remain in the forefront of research. Therefore, this study is a significant step forward in evaluating CMC, its role in interpersonal relationships, and ultimately, helping to improve infertility patient communication satisfaction and reducing anxiety.

Epilogue

This study has moved research one step closer to helping doctors and patients improve their communication during infertility treatment. It has also added to the field of communication by providing significant results, which can be used in future studies. For the researcher, this study has closed a chapter in my life, and opened the door to new beginnings and new research. The study for this thesis was initially conceptualized by me, the researcher, while I underwent infertility treatments and studied computer mediated communication. My personal connection to this subject guided me throughout my thesis in this culminating experience.

The stress and anxiety I endured helped me to develop the questions for the survey. I knew first-hand what components of the infertility experience I had found frustrating for three years. In communicating with my doctors at two clinics, I found that the clinics were at opposite ends of the spectrum with the quality and style of
communication. When it came to doctor-patient communication, two clinics in the same geographic region were completely contradictory.

The first clinic I encountered did not allow patients to communicate with their doctors outside of the office by phone or E-mail. The doctors did not answer my questions when we were face-to-face, did not provide a plan for treatment, and their demeanor made me feel powerless. All communication was doctor-centered and did not allow for collaboration. Messages were sent through the office staff and on many occasions, questions were dismissed and calls were not returned.

The second clinic where I received treatment provided a warm and inviting communication style for patients. I found the doctors not only willing to, but inviting me to communicate with them through E-mail. The office staff, nurses and doctors were friendly, approachable and made me feel at ease. On a regular basis, I could send an E-mail during an anxiety attack at 12 AM, and find an E-mail response from my doctor at 6 AM the same day. If I had an appointment with the clinic later that day, the doctors who saw me face to face were aware of my E-mails and acknowledged my concerns in person as well. This helped to reduce anxiety and built trust in the doctor-patient relationship.

Because of the two distinct differences in communication style I found at the clinics, I began to research and look for overall satisfaction ratings of infertility patients. While I found infertility patients had high levels of satisfaction in general, it intrigued me to discover that the one area of low satisfaction was found within communication. Therefore, the question of whether patient satisfaction related to communication became
one that I wanted to answer. In addition, since I had found much comfort and satisfaction in communicating with my doctors through E-mail, I wanted to know if other patients felt the same way.

Conducting research on infertility, computer mediated communication (CMC) and doctor-patient communication, has given me the opportunity to find a way to channel my own emotions about this disease and to add to the discussion within communication studies. I brought my own perspective to this study. The questions were developed through personal experience and through years of communication encounters with doctors. The questions I asked the participants were questions that had not been asked of infertility patients before in previous studies. The questions were derived from the patients’ perspective and a researchers’ interest in finding ways to improve communication.

This thesis allowed me to not only add to the field of communication studies, and heal from the stress and trauma of the disease; it also gave me a chance to ask questions that matter to patients and to hopefully help future research improve the communication between doctors and patients during treatment. Not only was I able to ask the questions, but I found significant answers. The study concluded that communication is important. The study concluded that E-mail communication is important, and the study concluded that E-mail communication satisfaction can reduce anxiety. If this study has helped one patient to find a new way to communicate with their doctor throughout infertility
treatment and helps them to reduce anxiety, then my thesis has not only served a purpose
to the communication and health communities, but also to the researcher.
APPENDIX A

Study Flyer

DOCTOR-PATIENT COMMUNICATION DEALING WITH INFERTILITY STUDY

Hello, my name is Joni and I was a patient with Northern California Fertility Medical Center (NCFMC) from November 2007 to October 2008. I am conducting a survey about infertility and communication and am asking for your assistance. I'd also like to share my passion for learning more about this issue.

During my treatment, I searched and searched for ways to help me deal with the diagnosis. I was lucky and found that I could cope with the anxiety, stress and unknowns of infertility by learning more about the possible benefits of communication during treatment, which is why I've chosen it for my master's thesis. For the last four years, I have studied doctor-patient communication, email communication, satisfaction and anxiety during infertility treatment and infertility communication. My research has led me here today, to ask you to help me by participating in a brief survey.

As you probably know, infertility affects one in eight couples and you are not alone. My personal goal is that the results of this study may not only help you, but also future infertility patients by improving communication between doctors and patients. The study is brief and should take you no more than 20 minutes. You can answer the questions online, in the privacy of your own home or private environment.

It is also completely anonymous – your name and identity will not be collected and answers are NEVER shared with anyone at NCFMC.

There are no direct benefits for your participation in the study other than knowing you have assisted in research that may be used to inform and educate the physicians and patients any gaps in communication you may perceive, help improve satisfaction and reduce anxiety in patients undergoing infertility treatment.

I hope you will volunteer to participate in this important study that will help all of us get one step closer to improving the relationship with your doctor and helping you during your infertility treatment.

With all my gratitude,

Joni Steed
Graduate Student
California State University, Sacramento
Department of Communication Studies

Survey Link: https://www.surveymonkey.com/s/Infertilitystudy2011

SACRAMENTO STATE
Leadership begins here.
APPENDIX B

Survey

<table>
<thead>
<tr>
<th>Infertility Communication 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Consent to Participate in Research</strong></td>
</tr>
<tr>
<td>This study examines the communication between patients and doctors at Northern California Fertility Medical Center (NCFMC).</td>
</tr>
<tr>
<td>You are being asked to participate in research conducted by Joni M. Stead, Graduate Student in Communication Studies, at California State University, Sacramento. The purpose of this research is to determine the effect of different forms of communication on satisfaction and anxiety levels of patients undergoing infertility treatment.</td>
</tr>
<tr>
<td>Procedures: You will be asked to complete a brief online questionnaire that includes questions about communication experiences you have personally had in communicating with your infertility specialist, any anxiety relating to communicating with your doctor, and your satisfaction. You will have the opportunity to provide as much or as little information in addition to the questions. You will be asked for demographic information, such as your age, sex, race, and level of education. Only NCFMC patients will be participating in this study and it does not matter where you are in your treatment plan.</td>
</tr>
<tr>
<td>Your participation is voluntary, you may skip questions, and you may quit at any time. Total participation time is expected to be no more than 20 minutes.</td>
</tr>
<tr>
<td>Risks: There is no risk in reading the survey questions other than you may feel slight psychological discomfort when thinking about communication experiences you've had with your doctors during treatment. There is no risk in answering the questions on the survey.</td>
</tr>
<tr>
<td>Benefits: There are no direct benefits for your participation in the study other than knowing you have assisted in research that may be used to be inform and educate the physicians and patients any gaps in communication you may perceive, help improve satisfaction and reduce anxiety in patients undergoing infertility treatment.</td>
</tr>
<tr>
<td>Confidentiality: All results obtained in this study will be anonymous. Participant names will not be collected and there is no connection between the study participants and NCFMC other than for recruiting participants initially.</td>
</tr>
<tr>
<td>Compensation: You will not receive any compensation for participating in this research.</td>
</tr>
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</table>
## Infertility Communication 2011

Contact information: If you have any questions about this research or technical difficulties with the survey, you may contact Joni Stead at (916) 359-9398 or send an e-mail to 2011infertilitystudy@gmail.com.

Your participation in this research is entirely voluntary. You are free to decide not to participate, or to decide at a later time to stop participating. Your responses will be kept confidential to the degree permitted by the technology used. No absolute guarantees can be given for the confidentiality of electronic data. Once you begin the questionnaire online, your answers cannot be removed because they have no identifying information on them. The researcher may also end your participation at any time. By clicking the box and completing this survey, you are agreeing to participate in this research.

<table>
<thead>
<tr>
<th>2. I am an infertility patient with NCFMC.</th>
<th></th>
<th>3. What is your age?</th>
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<tr>
<td>[ ] Currently</td>
<td>[ ] Previously</td>
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<th>4. What is your ethnicity?</th>
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<th>5. How many months have you been trying to conceive a baby?</th>
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<th>6. Amount of time (months) seeking medical assistance to conceive a baby?</th>
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<tr>
<th>7. How long have you been a patient at Northern California Fertility Medical Center (NCFMC)?</th>
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<tr>
<th>8. Were you treated at any other fertility clinics prior to becoming a patient at NCFMC?</th>
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<tr>
<th>9. If you were treated at another fertility clinic prior to becoming a patient at NCFMC, how long were you a patient at any and all other clinics (# of months)?</th>
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### Infertility Communication 2011

10. I was satisfied with my initial meeting with the doctors at NCFMC?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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11. I am satisfied with the amount of information received about my condition from my NCFMC doctor.

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<thead>
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<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

12. I am satisfied with the quality of information received from my doctor at NCFMC.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

13. I am satisfied with the amount of time it takes to receive communication from my doctors at NCFMC.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

14. I am satisfied with the amount of written information received from the doctors at NCFMC.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

15. I am satisfied with how easy it is to communicate with my doctors at NCFMC.

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<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

16. I am satisfied with the ease in asking my doctors questions at NCFMC.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.
### Infertility Communication 2011

17. Please rate your level of satisfaction with face to face communication with your doctors.

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<thead>
<tr>
<th>Highly Dissatisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Neither Satisfied or Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Highly Satisfied</th>
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Choose one.

18. Please rate your level of satisfaction with phone communication with your doctors.

<table>
<thead>
<tr>
<th>Highly Dissatisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Neither Satisfied or Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Highly Satisfied</th>
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Choose one.

19. Please rate your level of satisfaction with email communication with your doctors.

<table>
<thead>
<tr>
<th>Highly Dissatisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Neither Satisfied or Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Highly Satisfied</th>
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Choose one.

20. I would be less satisfied if I did not have email available to communicate with my doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

21. I like to use email when communicating with my doctors.

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<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.

22. How do you feel about leaving a voice mail for your doctor at NCFMC?

23. How do you feel about leaving a message with a nurse for your doctors at NCFMC?

24. How do you feel when you receive a message from someone other than your doctors at NCFMC?
### Infertility Communication 2011

25. When receiving a message from someone from NCFMC, if you have additional questions, are they generally answered in that conversation?  

26. I am satisfied with my doctors letting me take an active part in treatment decisions.  

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
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Choose one.  

27. I am satisfied with the quality of my doctor's responses to my questions.  

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<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
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Choose one.  

28. I am satisfied with the questions my doctor asks me.  

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<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.  

29. I am satisfied with my doctors listening to by concerns and questions.  

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<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
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Choose one.  

30. I am satisfied with the way my doctors allow me to elaborate on questions they ask without being rushed or interrupted.  

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<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
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Choose one.  

31. Overall, how satisfied are you when communicating with your doctors?  

<table>
<thead>
<tr>
<th>Highly Dissatisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Neither Satisfied or Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Highly Satisfied</th>
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Choose one.  

32. My preferred method of communication with my doctors outside of the office is.  

33. How often do you communicate with your doctor outside of office visits?  

34. Do you utilize the patient portal website at NCFMC to view test results and schedule appointments?
35. If you use the NCFMC patient portal, do you like having access to your medical records and test results online?

36. Would you prefer to receive information from a live staff member on the phone or communicate directly with your doctor through email?

37. How long does it take on average to receive a response from your doctors?

38. Does communicating online with your doctor increase or decrease the response time from your doctor?

39. What would help you to be more satisfied with communication with doctors at NCFMC?

<table>
<thead>
<tr>
<th>40. I have anxiety directly related to infertility treatment.</th>
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<tbody>
<tr>
<td><strong>Strongly Disagree</strong></td>
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<td>Choose one.</td>
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<table>
<thead>
<tr>
<th>41. I have anxiety directly related to delayed responses from doctors.</th>
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<tbody>
<tr>
<td><strong>Strongly Disagree</strong></td>
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<td>Choose one.</td>
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<table>
<thead>
<tr>
<th>42. I have anxiety directly related to the lack of emotional support from my doctors.</th>
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<tbody>
<tr>
<td><strong>Strongly Disagree</strong></td>
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<table>
<thead>
<tr>
<th>43. I have anxiety directly related to the quality of communication with my doctors.</th>
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<tbody>
<tr>
<td><strong>Strongly Disagree</strong></td>
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<td>Choose one.</td>
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### Infertility Communication 2011

#### 44. I have anxiety directly related to my need for a more concrete plan for treatment from my doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Choose one.

#### 45. I feel good about my treatment plan.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Choose one.

#### 46. I am frequently anxious about my treatment plan.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Choose one.

#### 47. I am frequently anxious when waiting for a response from my doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Choose one.

#### 48. I would be less anxious if I had more communication with my doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Choose one.

#### 49. I would be less anxious if I had quicker responses from my doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Choose one.

#### 50. My anxiety decreases when I send an email directly to my doctors and receive a response from the doctors.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Choose one.

#### 51. My anxiety would increase if I did not have the option to communicate with my doctors through email.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose one.
52. I am anxious when waiting to hear back from NCFMC.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose one.

53. What would help you feel less anxious when communicating with NCFMC?


54. How would you rate your overall anxiety related to communication with your doctors during treatment?

<table>
<thead>
<tr>
<th>Not anxious at all</th>
<th>Occasionally anxious</th>
<th>Moderately anxious</th>
<th>Regularly anxious</th>
<th>Severely anxious</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose one.
## APPENDIX C

Satisfaction Means and Standard Deviations of Statements Discussed

Table E1

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was satisfied with my initial meeting with the doctors at NCFMC</td>
<td>4.66</td>
<td>0.65</td>
</tr>
<tr>
<td>I am satisfied with the amount of information received about my condition from my NCFMC doctor</td>
<td>3.88</td>
<td>1.19</td>
</tr>
<tr>
<td>I am satisfied with the quality of information received from my doctor at NCFMC</td>
<td>4.20</td>
<td>1.27</td>
</tr>
<tr>
<td>I am satisfied with the amount of time it takes to receive communication from my doctors at NCFMC</td>
<td>4.27</td>
<td>2.12</td>
</tr>
<tr>
<td>I am satisfied with the amount of written information received from the doctors at NCFMC</td>
<td>3.83</td>
<td>1.26</td>
</tr>
<tr>
<td>I am satisfied with how easy it is to communicate with my doctors at NCFMC</td>
<td>4.44</td>
<td>0.84</td>
</tr>
<tr>
<td>I am satisfied with the ease in asking my doctors questions at NCFMC</td>
<td>4.56</td>
<td>0.71</td>
</tr>
<tr>
<td>Please rate your level of satisfaction with face to face communication with your doctors</td>
<td>4.38</td>
<td>0.92</td>
</tr>
<tr>
<td>Please rate your level of satisfaction with phone communication with your doctors</td>
<td>3.95</td>
<td>1.11</td>
</tr>
<tr>
<td>Please rate your level of satisfaction with email communication with your doctors.</td>
<td>4.10</td>
<td>1.06</td>
</tr>
<tr>
<td>I like to use email when communicating with my doctors.</td>
<td>4.49</td>
<td>0.78</td>
</tr>
<tr>
<td>Question</td>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
<td>--------------------</td>
</tr>
<tr>
<td>I am satisfied with my doctors letting me take an active part in treatment decisions</td>
<td>4.28</td>
<td>1.10</td>
</tr>
<tr>
<td>I am satisfied with the quality of my doctor’s responses to my questions.</td>
<td>4.18</td>
<td>1.22</td>
</tr>
<tr>
<td>I am satisfied with the questions my doctor asks me.</td>
<td>4.00</td>
<td>1.12</td>
</tr>
<tr>
<td>I am satisfied with my doctors listening to by concerns and questions.</td>
<td>3.90</td>
<td>1.39</td>
</tr>
<tr>
<td>I am satisfied with the way my doctors allow me to elaborate on questions they ask without being rushed or interrupted.</td>
<td>4.30</td>
<td>1.05</td>
</tr>
<tr>
<td>Overall, how satisfied are you when communicating with your of doctors</td>
<td>4.25</td>
<td>1.07</td>
</tr>
</tbody>
</table>
REFERENCES


Harris Interactive. (2002). Patient/physician online communication: Many patients want it, would pay for it, and it would influence their choice of doctors and health plans. *Harris Interactive Health Care News, 8*, 1-3.


