THE EFFECTS OF STIGMA, EFFICACY, AND SOCIAL SUPPORT ON THE FERTILITY QUALITY OF LIFE OF INDIVIDUALS STRUGGLING WITH INFERTILITY

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When investigating the communication surrounding infertility, many scholars have focused on privacy management and initial disclosures. This study extended existing research by applying the disclosure decision-making model (DD-MM) to investigate *ongoing* conversations about infertility between infertile individuals and a social network member. Participants who self-identified as either currently or previously infertile (n = 336) reported on their perceptions of fertility-related stigma, the quality of their fertility-related social support, efficacy (i.e., coping, target, communication, and confrontation), and fertility quality of life (FertiQoL) (a fertility-specific quality of life measure). Overall, fertility quality of life was influenced either directly or indirectly by perceived stigma and efficacy. Specifically, stigma decreased fertility quality of life, and this relationship was partially mediated by the individuals' perceptions of their efficacy. Additionally, the overall quality of previous fertility-related support was negatively correlated with the perception of stigma.

The findings of this study extend both the DD-MM and the knowledge on communicating about infertility in several meaningful ways. First, this study successfully applies the DD-MM to ongoing conversations, rather than initial disclosures. It also exemplifies the possible negative fertility quality of life outcomes after disclosing the stigmatizing condition, despite the many studies that have argued that disclosure is a generally positive experience.

Further, the results demonstrate the personal implications of infertility, and the individually focused coping process. Perhaps most importantly, the results of this study illuminate the detrimental implications of stigmatizing infertility, and provide a rationale for how and why health care providers and social network members should modify conversations surrounding the condition.

TABLE OF CONTENTS

Literature Review 11

Stigma 11

Fertility Quality of Life 14

Disclosure Decision-Making Model 17

Social Support 21

Efficacy 23

Method 26

Participants 26

Procedures 27

Measures 28

Data Analysis 32

Results 32

Discussion 32

Bibliography 44

Figures and Tables 53

Table 1 55

Figure 1 56

Table 2 57

Figure 2 58

Appendix 59

LIST OF TABLES AND FIGURES

1. Table 1: 55

2. Figure 1: 56

3. Table 2: 57

4. Figure 2: 58

The Effects of Stigma, Efficacy, and Social Support on the Fertility Quality of Life of Individuals Struggling with Infertility

According to the World Health Organization (2016), infertility is the "inability to become pregnant, an inability to maintain pregnancy, [or] an inability to carry pregnancy to live birth" (Multiple definitions of infertility section, para. 1). Infertility is a particularly frustrating health condition as it can be influenced by either male factors, female factors, or a combination of both, but the specific cause is often hard to determine and treat. With the social and cultural expectation for married couples to have children—especially in the United States—this condition can be both stigmatizing and marginalizing (Van Balen, Trimbos-Kemper, & Verdurmen, 1996). A 2006-2010 survey conducted by the Center for Disease Control found that in the United States, 1 in 8 couples struggle with conception or carrying a pregnancy to term (as cited on RESOLVE, 2017), suggesting that a significant proportion of Americans deal the physical and psychological repercussions of infertility on a daily basis. Yet despite its prevalence, infertility-related stigma is one of the central concerns of individuals and couples when deciding whether or not to disclose their infertility (Steuber & Solomon, 2011). The stigma created by infertility leads individuals to feel outcast from society based on their deviation from the social norm to procreate, and therefore leaves them to manage both the chronic illness and stigmatizing perceptions. One way that individuals manage the challenges associated with their infertility is through disclosure.

Several studies have looked at how individuals decide to manage disclosures related to infertility (Indekeu et al., 2013; Knoll & Bronstein, 2013; Martins et al., 2012; Rosholm, Lund, Molbo, & Schmidt, 2010). One main aspect that individuals evaluate when deciding whether or not to disclose is privacy (Bute, 2013). Specifically, individuals often want to maintain privacy by concealing their infertility, yet feel compelled to disclose to social network members as a

result of being asked questions about family planning. Indeed, Bute (2013) indicated that individuals struggling with infertility frequently managed inquiries from others about their childless status. In these conversations, both the infertile individual and their conversational partner are likely to shape the nature of the conversations, consequently impacting the likelihood and extent to which the individual struggling with infertility will disclose.

The perception of others is a central concern when disclosing chronic health issues. Specifically, individuals may fear exposing themselves to potential stigma and how responses from social network members could potentially change the nature of their relationship (Smith, Hernandez, & Catona, 2014). One way to frame these concerns regarding infertility-related conversations is through the lens of efficacy (Willis, 2016). Individuals may consider their own communication efficacy, coping efficacy, confrontation efficacy, and even the efficacy of their target before deciding to disclose a chronic health condition such as infertility. One of the reasons may be because individuals feel the disclosure sets the tone for future conversations with the recipient, and thus, they may only disclose if they feel efficacious in terms of talking about and coping with reactions to their infertility. Thus, decisions to reveal or conceal information about infertility become an integral part of their social relationships.

Other scholars have extended infertility disclosure research by examining the outcomes of disclosures (Slade, O'Neill, Simpson, & Lashen, 2007; Steuber & High, 2015; Steuber & Solomon, 2008). For instance, Steuber and High (2015) examined how different types of disclosures (i.e., direct disclosures, entrapment, indirect media, incremental disclosures, use of humor, and third party member disclosures) influenced perceived social support, fertility quality of life (FertiQoL; a fertility-specific quality of life measure), and overall quality of life. In sum, results indicated that perceived social support mediated the relationship between disclosure

strategy, FertiQoL, and overall quality of life. Specifically, the quality of social support fully mediated the relationship between disclosure strategy and FertiQoL, indicating that social support is essential in understanding the relationship between disclosure and FertiQoL. Further, when women perceived fertility-related social support to be effective, their quality of life increased. Based on the work of Steuber and High (2015), we know that disclosures (and disclosure strategies) influence infertile individuals' overall quality of life in initial conversations about infertility; however, the questions of how and why social support influences FertiQoL in ongoing conversations remains. Thus, the initial goal of this study is to consider how stigma affects infertile individuals' fertility quality of life.

As evidenced above, both the general quality of past social support and the quality of support provided by social network members are likely important influences on the fertility quality of life of infertile individuals. Thus, an additional goal of this proposed study is to extend current findings by moving beyond initial disclosure, to examine how these different aspects of social support influence stigma and FertiQoL. This study will extend existing research by linking quality of social support specifically to fertility quality of life to provide a better understanding of how both helpful and unhelpful social support influence the lives and well-being of infertile individuals.

Overall, research on infertility has examined disclosures, stigma, efficacy, social support, and fertility quality of life as salient but largely unrelated factors in understanding the nature of communication surrounding infertility. However, no study has considered these concepts collectively as predictors of fertility quality of life. Thus, the current study proposes a conceptual model linking each of these concepts together as predictors of FertiQoL, therefore extending our knowledge of infertility's impact on the well-being of affected individuals. Understanding these

connections is important for researchers and practitioners alike as stigma and social support are enacted and interpreted through interpersonal interactions. Individuals can shape the perceived stigma and amount of social support felt by others, and perhaps improve the quality of life of infertile individuals. This is especially significant in ongoing dialogues about issues like infertility, as the tone of these conversations can further impact the stigma felt by individuals as well as influence their perceived ability to cope with the issue. Consequently, the overarching goal of this study is to examine the mediating effects of efficacy, and the moderating effect of social support, in understanding the association between infertility-related stigma and FertiQoL.

Literature Review

Stigma

Stigma is a socially constructed concept that emerges through social interaction (Bos, Pryor, Reeder, & Stutterheim, 2013). It is a cyclical process that begins when individuals recognize that they are different from other people they encounter. This difference has a negative connotation that, whether apparent or perceived, causes the stigmatized individual to feel devalued. Based on this feeling of social devaluation, the perceived stigma is exacerbated, and the cycle of social comparison and devaluation continues. Individuals with stigmatizing conditions experience more depression (Hoy-Ellis et al., 2016), and mood and anxiety disorders (Meyer, 2003), than non-stigmatized individuals.

The experience of these mental health problems inversely impacts overall quality of life, which makes stigma an important consideration for individuals experiencing infertility. Stigma can be dealt with in one of three ways: passing, internalizing, or coping (Bresnahan & Zhuang, 2016). *Passing* refers to individuals pretending as if the stigmatizing condition does not exist and therefore refusing to acknowledge it. *Internalized stigma* is when individuals accept their

stigmatizing condition but don't talk about it; this is associated with physical health problems, including the diagnosis of chronic illnesses (Earnshaw, Quinn, & Park, 2011). Lastly, and perhaps most importantly, *coping* occurs when stigmatized individuals try to work through the feelings of stigma with the aid of social support. Therefore, the effects of stigma may be reduced when individuals decide to disclose, and receive beneficial social support, despite the associated difficulty. Morman, Schrodt, and Tornes (2012) found that in friendships between straight and homosexual men, self-disclosure mediated the relationship between homophobia and relational closeness, satisfaction, and commitment. Essentially, if a stigmatized (e.g., homosexual) individual chooses not to disclose, the homophobia of their friend may lead to decreased closeness, satisfaction and commitment. On the other hand, when a homosexual man discloses his sexual orientation to a homophobic straight friend, this disclosure is predictive of higher relational satisfaction, closeness, and commitment. This may apply to stigmatized health conditions like infertility, such that disclosing the issue leads to improved relational characteristics (i.e., closeness, satisfaction, and commitment) and consequently a higher quality of life. Therefore, stigma is an important element to consider when examining how infertility may affect FertiQoL. Research in other health contexts further supports the necessity to include stigma in this study.

Although stigma exists across a variety of contexts, it may be particularly informative when examined in the context of health conditions. Zhu, Smith, and Parrott (2017) studied how stigma influenced individuals with Alpha-1 antitrypsin deficiency (AATD) (a serious genetic disease that may inhibit both lung and liver function) in terms of secrecy, support availability, and stress. They found that affected individuals are not only stigmatized by those without the disease, but can be stigmatized by other affected individuals within the disease community.

Regardless of its source, experiencing a sense of stigma is likely to exacerbate individuals' perceived stress and perhaps impact their perceived availability of social support.

Boudewyns, Himelboim, Hansen, and Southwell (2015) found similar results when investigating how individuals talked about a positive sexually transmitted disease diagnosis. Their results indicated that perceived stigma was negatively related to the likelihood of having conversations about the sexually transmitted disease with both sexual partners and social network members. Further, they found that illnesses typically associated with higher stigma (i.e., chlamydia, gonorrhea, herpes, HIV, HPV, syphilis) were mentioned significantly less frequently on social media. In sum, stigma is likely to decrease the likelihood of individuals talking about and receiving support for their health conditions.

Stigma is prevalent in a variety of health contexts, and researchers have demonstrated that perceived stigma generally has a significant inverse relationship with a variety of factors influencing quality of life. However, few studies have looked specifically at the impact of stigma on infertile individuals. Stigma is commonly felt by both men and women struggling with infertility (Donkor & Sandall, 2007; Inhorn, 2004; Sternke & Abrahamson, 2015). Men and women not only deal with the personal stigma of an infertility diagnosis, but face collective stigma, as the diagnosis affects the family planning intentions and social perceptions of both partners. Slade, O'Neill, Simpson, and Lashen (2007) predicted that couples struggling with infertility would perceive high levels of stigma, producing small amounts of disclosure, which would result in low social support and, subsequently, high emotional distress. They found that regardless of the frequency with which an individual disclosed and their perceptions of available social support, individuals still felt stigmatized, often leading to emotional distress.

Overall, although stigma is a frequently-studied variable in research on health issues, it is

commonly associated with a particular health condition diagnosis, or as a deterrent to disclosure. In the context of infertility, however, individuals often struggle to separate their condition from other aspects of their lives and their identity. As a result, infertility-related stigma is likely to be more holistic. Therefore, an initial goal of this study was to extend what we know about the function of stigma in chronic health conditions, and examine specifically how it impacts infertile individuals' quality of life.

Fertility Quality of Life

Quality of life refers to the way that different parts of an individuals' life (i.e., physical health, mental health, social life, and spiritual practices) influence the perception of their position in the world (The Whoqol Group, 1998). Mercer (1997) stated that infertility is unique in that, after only six months of trying to conceive, the majority (i.e., 60%) of couples will be unable to do so without medical intervention (as cited on RESOLVE, 2017). Thus, infertility is not a quickly resolved problem; individuals experiencing it struggle with conception for months and potentially years. For individuals diagnosed with infertility, the actual health condition is often a large part of their identity and may introduce additional factors that affect quality of life (Boivin, Takefman, & Braverman, 2011a). One of the most frequently-cited and reliable measures of quality of life for individuals with chronic illness, the quality of life scale, measures overall material and physical well-being, social relationships, involvement in activities, personal development, and recreation (Burckhardt & Anderson, 2003), but fails to account for the influence of specific illnesses on overall quality of life. In an attempt to fill this gap, the fertility quality of life measure (i.e., FertiQoL) was developed. FertiQoL is a unique way to assess quality of life for individuals struggling with infertility, but such specific health condition related quality of life measures are common in health literature. For example, other valid and reliable

measures have been created for transfusion-dependent individuals (TranQol; Klaassen et al., 2014), hyperhidrosis (HirdoQoL; Kamudoni, Mueller & Salek, 2014), attention-deficit/hyperactivity disorder (AAQoL; Brod, Johnston, Able, & Swindle, 2006), and pediatric liver transplantation (PeLTQL; Ng et al., 2014) among many others. These narrow-banded measures provide insight into the unique toll that specific illnesses may take on an individual. This is practically useful as practitioners and social network members alike can tailor support to the deficient areas and, hopefully, improve disease-specific quality of life. Overall, different chronic health conditions influence quality of life in different ways, and therefore it is necessary to understand how a specific condition, like infertility, may uniquely impact an individual.

Prior to the development of the FertiQoL measure, scholars had developed a 14-item self-report measure that attempted to demonstrate how infertility influenced quality of life. However, it failed to holistically measure the impact of infertility on quality of life (Boivin, Takefman, & Braverman, 2011b). Therefore, the current conceptualization of FertiQoL was born. In the seven years since its creation, FertiQoL has been validated internationally (Gao, Ji, Zhou, & Zhang, 2016; Maroufizadeh, Ghaheri, Amini, & Samani, 2017) and continues to be validated as the most encompassing measure of the way that fertility problems can influence overall quality of life (Donarelli et al., 2016). Thus, although quality of life is valid in assessing what it aims to for most individuals, FertiQoL is beneficial when examining the quality of life of infertile individuals.

Perhaps because of its relatively recent conceptualization, most studies dealing with FertiQoL have focused on either validating the measure (Aarts et al., 2011; Chi, Park, Sun, Kim, & Lee, 2016; Donarelli et al., 2016), comparing sex differences (Hsu et al., 2013; Huppelschoten et al., 2013) or examining differences in couples from various countries (Sexty et al., 2016). Yet,

few studies have positioned FertiQoL as an outcome and investigated the different variables that may influence it. As a notable exception, Steuber and High (2015) looked at how different disclosure strategies and the perception of social support influenced both the quality of life and FertiQoL by comparing results from the two measures.

Despite the limited research using FertiQoL as an outcome, Steuber and High (2015) found that fertility quality of life and overall quality of life are affected in different ways, which supports this study's justification for focusing specifically on FertiQoL. Their results indicated that perceived quality of social support partially mediated the association between direct disclosures and overall quality of life. However, perceived quality of social support fully mediated the relationship between direct disclosures and fertility quality of life, suggesting that when using this narrow-banded measure, researchers better understand exactly how variables, such as perceived social support, influence the outcomes of fertility related struggles. This study adds much needed insight into how FertiQoL can be influenced based on stigma, efficacy, and history and quality of social support specifically, rather than just types of disclosure strategies.

Outside of the infertility context, several scholars have previously linked quality of life and stigma. Holzemer and colleagues (2009) found that perceived HIV stigma independently and significantly impacted overall quality of life. This relationship was inverse, such that the more HIV stigma perceived, the lower quality of life one experienced. Liu, Xu, Lin, Shi, and Chen (2013) found similar associations when examining HIV stigma and perceived quality of life within dyads. Their results not only corroborated the findings of Holzemer and colleagues (2009), but also extended the results by ascertaining that caregivers of individuals with HIV also experienced stigma that negatively affected quality of life. Shin, Joo, and Kim (2016) found that internalized stigma mediated the association between cognitive deficits in patients with

schizophrenia and quality of life, such that when individuals perceived that they have cognitive differences, the relationship between these differences and quality of life was mediated by their internalized stigma. Thus, it stands to reason that relationships between perceived physical differences, such as the inability to conceive a child, and overall quality of life, may also be mediated by stigma. Holubova and colleagues (2016) found that for individuals struggling with depression, self-stigma had a positive relationship with symptom severity and an inverse relationship with overall quality of life. Therefore, stigma not only affected quality of life, but actually exacerbated the symptoms of depression. Finally, Burgener, Buckwalter, Perkhounkova, and Liu (2015) found that stigma was related specifically with various quality of life outcomes (e.g., depression, anxiety, behaviors, personal control, physical health, self-esteem, social support, and participation in social activities) for individuals suffering from dementia. Taken collectively, these studies have demonstrated that stigma has a direct or mediational relationship with overall quality of life in a variety of health conditions; yet, the association between stigma and fertility quality of life has yet to be assessed. Thus, the following hypothesis is advanced:

H1: Infertility-related stigma will be negatively associated with fertility quality of life.

Disclosure Decision-Making Model

By definition, stigmatized individuals feel inherently different from others in society, and to reduce that perceived distance, they may avoid sharing information about their condition. The disclosure decision-making model (DD-MM) seeks to explain the process individuals go through when deciding whether to reveal or conceal information in initial disclosures (Greene, 2009). In the original conceptualization, Greene (2009) explained that several factors contribute to an individual deciding whether or not to disclose. For example, stigma about the disclosure, risk of exposure, need to inform others, personal education, and using the disclosure for education all

impacted decisions to reveal or conceal health-related information (Greene, Derlega, Yep, & Petronio, 2003). These factors were hypothesized to influence the strategies people used to disclose, which influenced the reactions of the recipient, and, in turn, influenced future decisions about when to share information going forward. Overall, the DD-MM demonstrates a cyclical process in which past disclosures influence the nature of future conversations (Greene, 2009) in the context of health related issues.

According to Greene (2009), there are three main steps individuals go through when deciding whether or not to disclose health related information. First, the individual assesses the information/diagnosis, which includes stigma, preparation, prognosis, symptoms, and relevance to others. *Stigma*, as discussed earlier, focuses on the perception that the diagnosis creates a difference between the individual and mainstream society; higher perceived stigma makes disclosure more difficult. *Preparation* focuses on how prepared the individual was for the diagnosis: if they have prior awareness that the disease or condition exists. For example, if an individual is diagnosed as infertile and has a family history of infertility, they may be more prepared for the diagnosis. Next, *prognosis* focuses on how treatable the disease or condition is (Greene, 2009); less treatable conditions lead to delayed disclosures. Fourth, the presence or absence of physical *symptoms* may impact likelihood to disclose, such that apparent physical symptoms serve as a catalyst for disclosure. Finally, individuals assess the *relevance* of their disease or condition to other people. If the diagnosis is relevant to others, the likelihood to disclose increases (Greene, 2009). For example, if a woman is diagnosed with infertility, this is relevant for her romantic partner to know, as it affects him or her too; thus, likelihood of disclosure would increase. If the assessment of each of these factors is favorable (i.e., low stigma, preparation, good prognosis, physical symptoms, and relevant to others), he/she will

move to the second step, which is appraising the information recipient.

After assessing the information or diagnosis, an individual then considers the potential receiver of the information (Greene, 2009). First, an individual assesses the relational quality of the receiver. *Relational quality* is composed of the intimacy, closeness, and anticipated future contact between the recipient and individual. Overall, relationships characterized as intimate, close, and with a high level of anticipated future contact increase the likelihood of disclosure. Next, an individual considers the *anticipated response* of the recipient. Importantly, and salient to the current investigation, the way that a recipient is anticipated to respond is based on past reactions of the recipient to prior disclosures (Greene, 2009). If a recipient has responded favorably to past disclosures, the discloser will likely anticipate a positive response to their current health-related disclosure. Generally, an anticipated positive reaction prompts disclosure, whereas an anticipated negative reaction suppresses disclosure. Overall, the combination of relational quality and anticipated response assessments lead an individual to move to the final stage in the DD-MM process.

Finally, if individuals find the recipient favorable, they then consider their own disclosure efficacy (Greene, 2009). Disclosure efficacy is "a person's perception of his or her ability to share the message to produce the desired results" (Greene, 2009, p. 229). If an individual doesn't feel efficacious or doesn't have the option to use an indirect strategy (e.g., a third party), disclosure will be unlikely. In the context of infertility, if an infertile individual believes he or she cannot disclose his or her struggle with infertility in a way that would spawn positive results, he or she will be less likely to disclose. On the other hand, if an individual feels efficacious or has a third-party member available to disclose the information, he or she will be more likely to disclose. In sum, if individuals positively assess the information, or diagnosis, and the receiver,

and feel efficacious about the disclosure, they are more likely to disclose their health-related issue to a social network member (Greene, 2009). This model has not only found support when explaining disclosures of health issues with physical symptoms, but it also explains the process of deciding to disclose conditions without physical symptoms like mental health issues (Greene et al., 2012) and extends to health issues in which the cause is not always known, such as infertility.

Several studies have used the DD-MM to investigate and predict initial disclosures in the health context (Choi et al., 2016; Smith, Hernandez, & Cantona, 2014; Venetis, Greene, Checton, & Magsamen-Conrad, 2015), but research looking at subsequent, or ongoing, disclosures is less common. In one notable exception, Checton and Greene (2012) applied the DD-MM to conversations about health-related issues beyond initial disclosures. Specifically, the assessments of information and the receiver, along with efficacy, predicted the depth, breadth, and patterns of disclosure (Checton, & Greene, 2012). Thus, they found that the DD-MM is useful in predicting *subsequent* disclosures of health-related information in addition to initial disclosures. This is a novel but important extension of the DD-MM as individuals rarely only have one conversation about significant health issues. This study continues the extension of the DD-MM by looking at subsequent disclosures of infertility.

Regardless of whether the DD-MM is used to examine initial or ongoing disclosures, one key factor is that it must be applied in health-related contexts where the conversational partners have a personal relationship (Greene, 2009). That is, when individuals disclose their health condition to a friend, family member, or other social network member, they consider each of these aspects (i.e., diagnosis, receiver, and efficacy), whereas they may not need to consider them when talking to a doctor. The primary difference is that disclosure to a medical professional

is typically enacted to receive information about or treatment for the condition, whereas disclosure to a social network member is oftentimes for soliciting social support. In keeping with its original intention, this study applied the model to investigate disclosures to family members, friends, coworkers, acquaintances, or other members of ones' social network, not medical professionals. Additionally, the DD-MM assumes that the anticipated reaction of the receiver is part of what influences an individual's decision of whether or not to disclose. This study further investigated this assumption in the creation of the conceptual model (see Figure 1), such that prior perceptions of social support, which help to create the anticipated response of the individual, may directly influence the stigma felt by the individual. This study not only adds to the body of research on the DD-MM beyond initial disclosure by examining ongoing conversations between infertile individuals and social network members, but it also adds to the body of research that utilizes the DD-MM as a framework for infertility disclosures.

Social Support

Social support includes both the verbal and nonverbal messages that aim to help others by buffering stress (Burleson, 2009). Social support may act as a buffer to stressful events by creating social networks, facilitating involvement in social activities, and result in increased physical and psychological health of the individual receiving support. Social support comes in a variety of forms, including tangible support, informational support, emotional support, group support, advice, and increasing self-esteem (Xu, & Burleson, 2001). The type of social support enacted in a given situation, the expected social support, and the amount of social support received all influence support quality, and may be subjective to the individual receiving it (Priem & Solomon, 2015). Cohen and Willis (1985) argued that perceived social support is not only effective in buffering stress related to short term adversity, but also works to buffer stress for

individuals dealing with chronic adversity, such as infertility. Although there are different types of social support, emotional support is often the most sought after and effective type (Priem & Solomon, 2015), but only when the support provided is evaluated as high quality. However, in cases of significant health issues, some relational partners may be unable to provide quality social support, in turn abandoning the buffering power of social support to reduce stress (Bolger, Foster, Vinokue, and Ng, 1996). For example, when discussing significant health issues, it may be challenging for social network members to provide social support because they may not know what to say to be helpful, they may unintentionally minimize the importance of the issue, or they may be struggling with processing the disclosure themselves. Therefore, it is important to not only measure whether or not social support was received, but also its perceived quality.

In the context of the DD-MM, one way that individuals utilize the quality of past social support is in their *current* decision to disclose information. Overall, Greene (2009) argued that a general history of high quality social support related to a specific topic would encourage an individual to disclose (and continue disclosing) similar information (e.g., related to infertility). However, a history of poor social support related to a specific topic is likely to discourage an individual to disclose information, or perhaps hinder its disclosure out of fear of negative reactions. Consequently, the perceived quality of previously provided social support regarding a health challenge such as infertility is likely to affect the emotions individuals experience about it. If previous support interactions consistently minimized their concerns, disregarded their feelings, or were characterized by indifference, this lack of validation is likely to negatively impact how individuals perceive their health challenge. In the context of infertility, prior conversations about infertility that were unhelpful or even hurtful seem likely to exacerbate perceived stigma. Notably, the DD-MM frames prior perceptions of supportive conversations as the cumulative

influence of previous interactions. Thus, the following hypothesis is proposed:

H2: Individual's perception of the overall quality of previous social support regarding infertility will be negatively associated with infertility-related stigma.

In contrast, when individuals receive high quality social support, they report higher physical and mental well-being (Berkman, 1995), likely contributing to their overall quality of life. Additionally, Bodie (2011) found that the more severe a stressor is, the more individuals ruminate on the content of a supportive message, suggesting a greater importance for high quality social support. Steuber and High (2015) found a positive association between perceived quality of social support and both general and fertility specific quality of life. Concurrently, Oetzel and colleagues (2014) found that social support is positively and directly related to quality of life, and that social undermining, which is similar to poor quality support, is negatively related to quality of life. That is, when individuals feel isolated or receive hurtful comments, their quality of life decreases. The element of isolation is especially important in this proposed study because the stigma associated with infertility creates a perception of isolation from the general public. If an individual perceives social support to be low quality and stigma makes him or her feel isolated, it is reasonable to predict that he or she will have a lower quality of life. On the other hand, if he or she perceives high quality social support, it may buffer the negative impact and isolation caused by stigma. Thus, the following hypothesis is proposed:

H3: Individual's perception of the quality of social support regarding infertility will moderate the negative association between infertility-related stigma and fertility quality of life.

Efficacy

Social support quality increases the physical and mental well-being of individuals which,

in turn, may bolster their overall confidence in their ability to discuss and cope with the issues of infertility. In contrast to the more general impact that overall support quality may have, *efficacy* refers to an individual's perception of his or her ability to achieve a specific outcome, or target a specific person to perform in a certain way (Bandura, 2004). Often framed as a construct unique to a relationship, Afifi and Weiner (2004) conceptualized three specific types of efficacy: coping, communication, and target. *Coping efficacy* refers to the belief of an individual that he or she has the necessary tools to deal with the outcomes of a specific interaction. For example, in the context of infertility, individuals assess whether they would be able to manage responses to their disclosures of infertility in conversations with a particular social network member. *Communication efficacy* targets the evaluation by an individual that he or she can adequately communicate the necessary information (Afifi & Weiner, 2004). For example, infertile individuals might feel like they understand their infertility, are knowledgeable on the topic, and can sufficiently explain the diagnosis and repercussions about it if they consider themselves to be communicatively efficacious. *Target efficacy* focuses on the target of the message, rather than the individual giving information (Afifi & Weiner, 2004). Here, a discloser evaluates the ability of a target to provide relevant and honest information. Additionally, Makoul and Roloff (1998) conceptualized *confrontation efficacy*, which is the perception of individuals that they can voice complaints in response to the behavior of a target. For example, if an individual discloses his or her infertility and the receiver responds with an inappropriate comment, confrontationally efficacious people will believe they possesses the ability to tell the original receiver that his or her response was inappropriate.

Researchers have frequently studied efficacy in terms of information management, as a catalyst to disclosure, and as an outcome of conversations (Dillow & Labelle, 2014; Lancaster,

Dillow, Ball, Borchert, & Tyler, 2016; Rafferty, Cramer, Priddis, & Allen, 2015; Steuber & Solomon, 2011; Willis, 2016). In the context of infertility, Steuber and Solomon (2011) found that efficacy moderated the relationship between stigma and willingness to disclose information about infertility to social network members. Infertility-related stigma, in turn, is also likely to influence an individual's sense of efficacy. Specifically, in this study, efficacy is comprised of both self- and other evaluations. A heightened sense of stigma is likely to impact not only the infertile individual's perception of their ability to discuss their health condition (i.e., communication and coping efficacy), but also their perception of how the other person will react (i.e., target and confrontation efficacy). An individual's perceived inability to discuss their infertility is likely to have negative consequences for their overall quality of life. In existing research examining how efficacy impacts individual's reaction to stress, those displaying greater efficacy responded more resiliently to stress and adversity (Carr & Koenig Kellas, 2017) and were likely to experience greater quality of life as a result. Taken collectively, the (in)ability to discuss infertility-related information with a particular social network member may help explain the connection between stigma and fertility quality of life. To test this line of reasoning, the following hypothesis is presented:

H4: Infertility-related efficacy (i.e., communication, coping, target, and confrontation efficacy) will mediate the association between stigma and fertility quality of life.

If individuals feel comfortable and confident in discussing their infertility with a specific person, having previously received high quality social support is likely to enhance the beneficial impact on their fertility quality of life. However, if a person receives inadequate or socially undermining support in the context of a specific relationship, efficacy may not be enough to offset the negative effects on their quality of life. To investigate this line of reasoning, a final

hypothesis is proposed:

H5: The quality of social support regarding infertility will moderate the positive association between efficacy and fertility quality of life.

Method

Participants

Data were collected from 336 individuals who reported being currently or previously infertile. Participants in this study included 217 (98.2%) females and 4 (1.8%) males ranging in age from 25 to 66 years (*M* = 36.11, *SD* = 6.06). The majority of participants (87.3%, *n* = 193) identified as White, with 4.1% (*n* = 9) identifying as Hispanic American, 3.2% (*n* = 7) as African American, 2.7% (*n* = 6) Asian American, 2.3% (*n* = 5) preferred not to say, and 0.5% identifying as Other (*n* = 1; Muslim). Most participants were currently married or in a domestic partnership (96.4%, *n* = 213), although 2.7% (*n* = 6) were single (never married), and 0.9% (*n* = 2) were divorced. The majority of participants in the sample had received a medical diagnosis of infertility (86.2%, *n* = 187) while 13.8% had not (*n* = 30), but reported that they self-identified as infertile because of their inability to conceive. Most participants identified as currently infertile (77.8%, *n* = 172), whereas 22.2% (*n* = 49) identified themselves as struggling with prior infertility. Those who currently qualified themselves as infertile reported trying to conceive for anywhere from 1 to 19 years, with an average length of 4 years and 3 months (*SD* = 3.28). Those who previously dealt with infertility reported that they attempted to conceive for anywhere from 1 to 16 years, with an average length of 3 years and 3 months (*SD* = 3.13). A small majority of the participants (56.7 %, *n* = 123) had children at the time of the study, while 43.3% (*n* = 94) of the participants did not. Of those participants that had children, 59.7% (*n* = 77) were related biologically, 19.4% were related by other means (*n* = 25; i.e., donor egg or sperm, embryo

adoption, miscarriage, or a combination of mentioned methods), 9.3% (*n* = 12) were related through adoption, 8.5% (*n* = 11) were related through marriage, 1.6% (*n* = 2) were related through a gestational carrier, and 1.6% (*n* = 2) were related through a surrogate.

Participants were also asked to report on the conversational partner with whom they had recently discussed their infertility. The majority of confidants were female (85.1%, *n* = 205), with 14.9% (*n* = 36) being male. Although confidants were overwhelmingly friends (42.7%, *n* = 103), 11.6% (*n* = 28) were coworkers, 9.5% (*n* = 23) were mothers, 8.3% (*n* = 20) were the spouse or romantic partner, 8.3% (*n* = 20) were acquaintances, 5.4% (*n* = 13) reported on others (i.e., cousins, strangers, neighbors, etc.), 4.1% (*n* = 10) were sisters, 3.7% (*n* = 9) were sisters-in-law, 2.5% (*n* = 6) were mothers-in-law, 1.2% (*n* = 3) were brothers, 0.8% (*n* = 2) were fathers, 0.8% (*n* = 2) were aunts, 0.4% (*n* = 1) were fathers-in-law, and 0.4% (*n* = 1) were grandmothers.

Procedures

After gaining human subjects approval, participants were recruited by utilizing snowball sampling through social and personal networks. Specifically, participants were recruited through social media (i.e., Facebook), face-to-face and online support groups, national organizations, and fertility clinics. All participants were required to be at least 18 years old, currently or previously struggling with infertility, and be able to recall a recent conversation about their infertility with a member of their social network. If they met these criteria, participants were able to click the link to the online survey.

Prior to beginning the online survey, participants were directed to an informed consent page where they verified that they met the qualifications and agreed to participate. Participation was voluntary and anonymous. After completing the survey, participants had the option to enter their e-mail address for a chance to win a $25 Amazon e-gift card as an incentive for

participating in the research. To enter their e-mail addresses, participants clicked a link to a separate Qualtrics survey where their e-mail address was de-identified from their survey responses. Participation in the survey took approximately 30 minutes, and the participants could terminate it at any time without penalty by closing the browser window. The survey involved completing a variety of measures related to stigma, efficacy, and social support, as well as describing a recent conversation about the participant's infertility and reporting on the relationship of the person with whom the participant had the conversation.

Measures

Fertility Quality of Life. Boivin, Takefman, and Braverman's (2011a) Fertility Quality of Life Scale (FertiQoL) was used to measure quality of life related specifically to infertility. The core module that was used is composed of 24 items measuring infertility-related quality of life. The FertiQoL scale is broken into four different subscales: emotional (6 items; e.g., "Do your fertility problems cause feelings of jealousy and resentment?"), mind/body (6 items; e.g., "Do you feel drained or worn out because of your fertility problems?"), relational (6 items; e.g., "Have fertility problems had a negative impact on your relationship with your partner?"), and social (6 items; e.g., "Are you satisfied with the support you receive from friends with regard to your fertility problems?"). Responses for each subscale were solicited using one of several 5-point Likert- scales[1] (1= *Very poor* to *5= Very good*; 1= *Very dissatisfied* to 5= *Very satisfied*; 1= *Completely* to 5= *Not at all*; 1= *Always* to 5= *Never*; 1= *An extreme amount* to 5= *Not at all*).

[1] Each subscale is comprised of different statements, and each statement is associated with a different 5-point Likert scale depending on the content of the question. For example, in the emotional subscale the question "Do your fertility problems cause feelings of jealousy and resentment" is answered on the response scale 1= *Always* to 5= *Never*. Whereas the question "Do you feel sad and depressed about your fertility problems?" is answered on the response scale 1= *An extreme amount* to 5= *Not at all.* The mind/body, relational, and social subscales also follow this trend. The complete measure is available in the Appendix.

Previous research using this measure (Boivin, Takefman, & Braverman, 2011a) has displayed high reliability (Cronbach's α= .92) across all subscales as well as reliability among the four subscales: emotional (Cronbach's α= .90), mind-body (Cronbach's α= .84), relational (Cronbach's α= .80), and social (Cronbach's α= .75). This study also achieved high reliability (Cronbach's α= .92) across all subscales and reliability among the four subscales: emotional (Cronbach's α= .89), mind/body (Cronbach's α= .87), relational (Cronbach's α=.83), and social (Cronbach's α=.75). Five items were reverse coded and scores were averaged across subscales such that higher scores indicated higher fertility quality of life.

Social Support.

Communication-based emotional support. To investigate how communication within interpersonal relationships can convey emotional support, this study employed Weber and Patterson's (1996) Communication-Based Emotional Support Scale. The 13-item scale was adapted to solicit responses in two different ways. First, to measure participants' general evaluation of previous social support (i.e., for H2 and H3), individuals completed items designed to assess the overall quality of fertility-related social support. Items were adapted to solicit responses directly discussing infertility (e.g., "These people helped me work through my thoughts and feelings about decisions concerning my infertility."). Consistent with the DD-MM, these items were summed to create a score reflecting participants' evaluation of their previous infertility-related social support. This adaptation of the measure achieved excellent reliability (Cronbach's α= .93).

Second, to measure the quality of social support from a specific person (i.e., for H5), this study solicited responses based on the social support from the specific person they reported on earlier in the survey (e.g., "My [person] helped me work through my thoughts and feelings about

decisions concerning my infertility.”). All responses were recorded on a 5-point Likert scale (1=*Strongly disagree* to 5= *Strongly agree*), and responses from this adapted measure were summed to create a score reflecting participants’ evaluation of their recent conversation with a member of their social network. Three items were reverse coded such that higher scores indicated greater communication-based emotional support. Previous research using this measure (Weber & Patterson, 1996) has produced excellent reliability (Cronbach’s α= .93) and this study achieved similarly high reliability (Cronbach’s α= .95).

Stigma.

Personalized stigma. Steuber and Solomon (2011) adapted this personalized stigma measure from Berger, Ferrans, and Lashley’s (2001) HIV Stigma Scale to measure feelings regarding infertility based on past experiences or fears. Respondents completed four items (e.g., “I have been hurt by how people react to learning we are infertility.”), reported on a 5-point Likert scale (1= *Strongly disagree* to 5= *Strongly agree*). Previous research using this measure (Steuber, & Solomon, 2011) has provided evidence of good reliability (Cronbach’s α= .88), and this study achieved similar reliability (Cronbach’s α= .85).

Disclosure concerns. Steuber and Solomon (2011) adapted this measure from Berger, Ferrans, and Lashley’s (2001) HIV Stigma Scale to solicit responses about individual desires to keep information about infertility private. Respondents completed four items (e.g., “I worry that other people who know we are infertile will tell others.”) on a 5-point Likert scale (1= *Strongly disagree* to 5= *Strongly agree*). Previous research using this measure (Steuber & Solomon, 2011) has displayed good reliability (Cronbach’s α= .84), and this study reflected a similar reliability estimate (Cronbach’s α= .88).

Consistent with the way these measures have been utilized in previous research,

participants' responses from both subscales were combined to create an average score of infertility-related stigma, such that higher scores represented more stigma.

Efficacy.

Communication efficacy. To measure how capable individuals feel about their ability to communicate about their infertility, this study employed a measure adapted from Rafferty, Cramer, Priddis, and Allen (2015), who adapted their measure based on the original measure of Afifi and Afifi (2009). Participants answered three items (e.g., "I am able to talk about my infertility to my [person].") on a 7-point Likert scale (1= *Strongly agree* to 7= *Strongly disagree*). Previous research (Rafferty et al., 2015) has evidenced excellent reliability (Cronbach's α= .96), and this study achieved high reliability (Cronbach's α= .94).

Target efficacy. Afifi and Afifi (2009) conceptualized this measure to assess how capable individuals believe the target of their message is to receive it. This is a four-item measure which has been adapted to solicit fertility-related responses (e.g., "My [person] is completely honest in his/her response to my infertility."]. Responses were solicited on a 7-point Likert scale (1= *Strongly disagree* to 7= *Strongly agree*). Previous research (Afifi & Afifi, 2009) has provided evidence of good reliability (Cronbach's α= .85), and this study also achieved reliability (Cronbach's α= .88).

Coping efficacy. To measure the perceived capability of the individual to cope with the responses he/she receives to disclosures of infertility, this study employed a measure that Rafferty, Cramer, Priddis, and Allen (2015) originally adapted from Afifi and Afifi (2009). Participants completed 4 items (e.g., "I feel confident that I can cope with all reactions to my infertility disclosures.") on a 7-point Likert scale (1= *Strongly disagree* to 7= *Strongly agree*). Previous research (Rafferty et al., 2015) has displayed acceptable reliability (Cronbach's α= .78),

and this study achieved good reliability (Cronbach's α= .84). Two items were reverse coded such that higher scores indicated greater coping efficacy.

Confrontation efficacy. To assess the perceived ability of individuals to confront someone's response to their infertility, Steuber and Solomon (2011) adapted this measure from Makoul and Roloff (1998). Participants completed four items (e.g., "It is very easy for me to initiate a discussion with my [person] about something they did that irritated me regarding my infertility.") on a 6-point Likert type scale (1= *Very strongly disagree* to 6= *Very strongly agree*). Previous research (Steuber & Solomon, 2011) has evidenced excellent reliability (Cronbach's α= .97), and this study achieved high reliability (Cronbach's α=.92).

As in previous research regarding efficacy, participants' responses from each subscale were combined to create an average score of infertility-related efficacy, such that higher scores represented greater efficacy.

Data Analysis

Descriptive statistics, including means, standard deviations, and Pearson's product-moment correlations are reported in Table 1. Results of the bivariate correlations were used to test H1 and H2, and path analysis using PROCESS in SPSS (Hayes, 2013) was used to test H3 through H5.

Results

Overall, the bivariate results reported in Table 1 offer support for the first two hypotheses. Specifically, H1 predicted that infertility-related stigma would be inversely associated with fertility quality of life. Results indicated that infertility-related stigma has a small but meaningful negative influence on fertility quality of life (r = -.34, p < .01), such that individuals who experienced more stigma also tended to have a lower fertility quality of life.

Thus, H1 was supported. Similarly, H2 predicted that the overall quality of previous fertility-related support would be negatively associated with infertility-related stigma. Indeed, results indicated that the higher quality social support regarding infertility was associated with less infertility-related stigma (r = -.40, p < .01), providing support for H2.

To test the claims of moderation posited in H3, Model 1 in PROCESS was used with 10,000 bias-corrected bootstrapped samples. Hypothesis three predicted that the general quality of past social support regarding infertility would moderate the association between infertility-related stigma and fertility quality of life. Although the overall model was significant, F = (3, 265) = 16.94, p < .001, R^2 = .20, and both the quality of social support and stigma emerged as significant predictors, the interaction term failed to reach statistical significance, b = -.04, p = .06. Thus, H3 was not supported.

To test hypothesis four, mediation using ordinary least squares path analysis was conducted which predicted that stigma indirectly influenced a person's fertility quality of life through its effect on infertility-related efficacy (i.e., communication, coping, target, and confrontation efficacy). As illustrated in Figure 2 and Table 2, participants with greater stigma experienced reduced efficacy (a = -.56) and those with reduced efficacy also reported lower fertility quality of life (b = .19). A bias-corrected bootstrap confidence interval for the indirect effect (ab = -.10) did not include zero (90% CI: -.167 to -.065), providing evidence of a significant indirect effect, although there was also a direct effect of stigma on fertility quality of life (c' = -.17, p < .01). Thus, H4 was supported.

Lastly, H5 predicted that the quality of social support received from a particular social network member regarding infertility would moderate the positive association between efficacy and fertility quality of life. As in H3, Model 1 in PROCESS was used with 10,000 bias-corrected

bootstrapped samples to test moderation. Although the overall model was significant, F (3, 225) = 18.90, $p < .001$, $R^2 = .20$, the interaction between efficacy and person-specific social support did not emerge as a significant predictor of participants' fertility quality of life, $b = .00$, $p = .97$. Thus, H5 was not supported.

Discussion

The goal of this study was to examine how stigma, social support, and efficacy influence infertile individuals' fertility quality of life. Overall, results indicated that stigma was inversely related to fertility quality of life, such that the more stigma an infertile individual felt, the lower his or her FertiQoL. However, the quality of individual's fertility-related emotional social support that they previously received was significantly related to the way they experienced stigma. Despite this, and somewhat surprisingly, the relationship between stigma and FertiQoL was unaffected by typical buffering factors (i.e., social support). Yet, how capable individuals felt in their ability to communicate about, cope with, confront responses to, and select an appropriate target to receive their message, accounted for part of the relationship between stigma and FertiQoL. Essentially, this means that individuals, rather than their social networks, hold the power to decrease the impact of stigma on well-being. Thus, when taken collectively, the results of this study add important contributions to our current understanding of what influences the well-being of infertile individuals.

First, and consistent with previous stigma literature (Hoy-Ellis et al., 2016; Inhorn, 2004; Meyer, 2003; Slade et al., 2007), the results of this study confirmed that the perception of stigma decreases fertility quality of life for individuals who are currently or have previously struggled with infertility. Specifically, our findings indicated a significant negative relationship between the perception of stigma and FertiQoL. When individuals perceived that they were stigmatized

due to their infertility, their fertility quality of life was also affected, which reflected decreased well-being. Similarly, it is also plausible that the reason why some infertile individuals reported higher FertiQoL was because they perceived less stigma. However, these results extended the findings of Slade and colleagues (2007) who reported that for both men and women, perceived stigma caused infertility-related distress, conceptualized through measures of depression and anxiety. The results of this study not only corroborated the findings that emotional distress may occur as a result of infertility-related stigma, but that this may not only be momentary distress, but rather create a lasting negative impact on quality of life. Further, these results contributed to the existing stigma and infertility literature as a whole. Whereas many studies have linked stigma to chronic health issues such as sexually transmitted diseases (Boudewyns et al., 2015), AATD (Zhu et al., 2017), and HIV (Berger et al., 2001), few studies have looked at the implications of stigma targeting infertile individuals. The specific impact of stigma on infertile individuals is necessary to continue studying as it may function as a secondary challenge of the diagnosis. Infertile individuals must first cope with their initial diagnosis of infertility, which changes the schema of married life for many and even lowers marital satisfaction (High & Steuber, 2014). The stigma associated with the diagnosis, due to the societal expectation for procreation, may then add an additional layer to the coping process. As an example, Sternke and Abrahamson (2015) noted that when infertile individuals felt as though their social status decreased, they were considered disabled, and thus, they felt that they were worth less than “normal” individuals. Further, Earnshaw, Quinn, and Park (2011) found that simply the anticipation of stigma may interact with stress to produce diminished quality of life outcomes. Thus, the mere thought of being stigmatized for infertility, a condition out of the individual’s control, adds a significant hurdle to the coping process and has a measurable effect on infertile individuals’ fertility quality

of life.

Given the well-established influence of social support in managing chronic health conditions such as infertility, it seemed reasonable to assume that individuals' general perception of previous social support interactions would act as a buffering agent between stigma and FertiQoL. Although this was not the case, results did indicate that stigma decreased when individuals perceived a cumulative history of positive and high quality support across their social network. There are other potential factors that could influence the relationship found such as the frequency with which the individual had disclosed the information, the types of people who provided support (i.e., family, coworkers, friends), or the amount of time since the infertility diagnosis. Further, the nature of correlational data could also have meant that the greater stigma perceived, the lower quality social support perceived. This isn't entirely surprising, as past research (Smith, Rossetto, & Peterson, 2008; Zeligman, Barden, & Hagedorn, 2016) on HIV stigma and social support also found a negative relationship. However, this offers important contributions to the infertility literature.

Given their correlational nature, these results also allow the interpretation that stigma negatively influenced perceived social support. Bresnahan and Zhuang (2016) supported this interpretation when they stated that those who internalize stigma often concealed the condition, were less likely to seek help, and felt reduced self-worth. Thus, if a stigmatized individual was less likely to seek social support and more likely to feel shame, any social support received may have felt unsatisfactory through the lens of their existing perception of stigma. The finding also allows for the interpretation that social support providers have the ability to decrease perceived stigma. Slade and colleagues (2007) found that the mere perception of social support for both men and women in an infertile marriage decreased the perception of stigma. Therefore, having

the availability of a social network to disclose the condition to may, in itself, decrease initial stigma. Thus, social network members may have the ability to influence perceived stigma most dramatically at the very early stages of diagnosis.

Relatedly, results of this study indicated that perceived quality of previous social support did not moderate the relationship between infertility-related stigma and FertiQoL Essentially, this means that even high quality social support did not alter the negative relationship between perceived stigma and FertiQoL. These findings are consistent with those of Zeligman and colleagues (2016) who found that for individuals diagnosed with HIV, the interaction between social support and stigma did not have a significant effect on post traumatic growth. One possible reason for these findings lies with the way that individuals deal with this stigma. As Earnshaw, Quinn, and Park (2011) found, those that internalize stigma often suffer from physical health issues. Part of these physical health issues may be caused by a decrease in overall well-being due to the internalization of stigma. Although social support did not moderate the relationship between stigma and FertiQoL, there are some other variables that should be considered. For example, researchers may want to consider how time affects the relationship between stigma and FertiQoL. It stands to reason that the more time passes and the longer individuals have to cope with the infertility diagnosis, the less impact stigma will have on FertiQoL. Additionally, the presence of children, whether biological, through marriage, or adopted, could moderate this association. Specifically, Donkor and Sandall (2007) found that the presence of children in the home created less stress, and may also decrease the perception of stigma. If a family had children in the house, they may have felt less stigmatized simply because the need to justify why they were childfree disappeared.

Further, the number of times one had discussed their infertility may moderate the

association between stigma and FertiQoL. Oftentimes, literature positions stigma as a predictor of disclosure (Morman, Schrodt, & Tornes, 2012; Slade, O'Niell, Simpson, & Lashen, 2007; Zhu, Smith, & Parrott, 2017), and in many cases the greater the perception of stigma, the less likely an individual was to disclose. However, in this study a prerequisite was that the individuals had disclosed their infertility. It is possible that the number of times individuals had conversations about their infertility, the greater their communication efficacy, and the greater their FertiQoL.

Relatedly, and perhaps more importantly, the results of this study indicated that infertility-related efficacy (i.e., communication, coping, confrontation, and target) mediated the association between stigma and fertility quality of life. Specifically, results indicated that stigma was inversely related to infertility-related efficacy, which helped to explain its impact on fertility quality of life. Thus, although there was a significant and direct relationship between stigma and FertiQoL, this association was partially explained by variations in individuals' sense of fertility-related efficacy. Consistent with the assumptions of the DD-MM (Greene, 2009), the more stigmatized individuals felt about a health condition the less likely they were to disclose it. In our results, efficacy positively predicted FertiQoL, such that as efficacy increased FertiQoL increased. In addition to the indirect effect, there was a direct, inverse relationship between stigma and FertiQoL. Although efficacy accounted for part of the relationship between stigma and FertiQoL, stigma had an independent influence on quality of life outcomes. Thus, this study offers an important extension of the DD-MM by considering the direct and indirect influences on fertility quality of life. Therefore, stigma was not only an initial hurdle to clear when choosing how, to whom, or when to talk about a health condition, but it also created lasting effects even after conversations. Additionally, these results extended the findings of Carr and Koenig-Kellas

(2017), such that not only did more efficacious individuals react more resiliently in the face of stress, but efficacious responses may have positively influenced quality of life outcomes. Further, these results build off of the findings of Steuber and Solomon (2011) to enrich the body of infertility literature. Specifically, we may have seen the positive relationship between efficacy and FertiQoL because individuals who felt comfortable talking about their infertility may have been less impacted by the diagnosis than those who felt less efficacious.

Finally, results indicated that perceived infertility-related social support did not moderate the association between efficacy and fertility quality of life. Again, social support was most influential prior to the evaluation of stigma, rather than intervening in the processes that occurred following the perception of stigma. In other research (Israel-Cohen, Kaplan, Noy, & Kashy-Rosenbaum, 2016; Motl, McAuley, Snook, & Gliottoni, 2009), social support and efficacy had independent direct effects on quality of life outcomes. Our findings then indicated that in chronic health situations, something about social support and efficacy function in such ways that rather than interacting with each other, they were strong enough to independently influence quality of life outcomes. In the context of infertility, it could be that whether or not individuals were confident in their ability to communicate about the condition was more significant to coping with infertility than the feedback by social network members. Specifically, infertility is an extremely personal issue, and it stands to reason that once an individual has made sense of the condition and reaches a level of acceptance, his or her feelings about the infertility are more influential than the opinions of social network members. Indeed, Steuber and Solomon (2011) found that romantic partners engage in collective identity management during disclosures, such that the wife may disclose infertility in an effort to protect a blow to her husband's identity. In this case, the response of social network members may not have as significant of an impact on the

situation, because partners have already had numerous discussions and formed a plan for how to talk about the condition.

Overall, the results of this study offer several important implications. First, stigma has a significant effect on quality of life, and this effect is hard to mitigate without communication. This raises questions of how social network members and practitioners can help infertile individuals. Rather than focusing on teaching doctors and social network members to provide effective social support, perhaps it would be more beneficial to coach them on what kinds of messages decrease the perception of stigma. To do this, researchers will have to answer the question of what types of messages cause the recipient to perceive stigma. For example, one suggestion may be to talk to social network members about the possible negative consequences of asking newlyweds when they will have children. In sum, this study highlights the need to temper the normative cultural rhetoric that it is expected to have children, and that any couple that deviates from this path is wrong.

Additionally, the findings of this study imply that although social support does not lessen the effect of stigma in this case, it also doesn't negate its importance. To further decompose the findings, perhaps researchers should consider the discrepancy between the types of social support being received and the type of support wanted. Along these lines, it may be important to evaluate specific messages of social support, the perception of these messages by infertile individuals, and the overall intent of the social support provider. By conducting such research, scholars could learn how to most effectively coach individuals to provide social support to network members struggling with infertility and potentially positively impact quality of life outcomes.

Finally, this study illuminates the impact of infertility in the United States. The

demographics of the participants in this study show the significant amount of time infertile individuals struggle with the condition before conceiving, adopting, acquiring a child in other ways, or giving up. Further, the findings show that infertility has a significant impact on fertility quality of life, due, in the most part, to the stigma surrounding infertility. With 1 in 8 couples in the United States struggling with the condition (Resolve, 2017), it is imperative that medical providers and social network members learn how to most effectively aid these individuals in terms of both resources and support. One of the most impactful ways to improve the lives of infertile individuals is to reduce the stigma surrounding the condition. Since stigma is a socially constructed concept, it is up to individuals to change the rhetoric surrounding childless couples. In doing so, infertile individuals who suffer in silence as others make judgments about their childless status may feel less stigmatized.

Like any study, there are limitations that should be considered when evaluating the aforementioned results. First, the majority of the participants in this study were Caucasian and female, which limits generalizability. The majority of research on infertility suffers from a lack of male participants. One reason for this may be the culturally prevalent desire to protect the identity of men as mentioned by Steuber and Solomon, (2011) despite evidence that suggests the man may be medically infertile. This is a limitation because the few studies that have had the ability to compare men and women (Steuber & Solomon, 2008) have found significant differences in the ways that men and women handle an infertility diagnosis. Specifically, Steuber and Solomon (2008) found significant differences in disclosure patterns based off of whether the male or female partner experienced personalized stigma. In turn, this could influence the results presented because women are more likely to disclose infertility regardless of stigma, potentially leading to increased efficacy and increased fertility quality of life. The absence of men in our

sample (and in fertility research in general) may be because they disclose infertility less, which could actually significantly increase perceived stigma and decrease fertility quality of life.

Additionally, the retrospective self-report surveys used in this study present a limitation. Asking participants to recall a conversation about their infertility may inherently bias the results because individuals may select interactions that stuck out as particularly important or unusual. This means that in terms of social support, for example, individuals may have selected conversations where they received abnormally poor or exceptional social support. One potential solution to this limitation is to conduct a longitudinal study and have individuals complete the measures after each conversation regarding infertility. By identifying certain messages, or message features that increase the feeling of perceived stigma, researchers can apply their findings and teach practitioners and laypeople alike how to manage this stigma.

Despite these limitations, the results presented here offer important insight into the lives of infertile individuals and suggest several potential directions for future research. First, researchers should look at dyads as the unit of analysis rather than the individual. This is especially important in the context of infertility because this is a condition that not only affects the life of the infertile individual, but their partner as well. Along with this, the partner is generally the most immediate source of social support, particularly in the initial stages of diagnosis. Additionally, future research could add to the body of literature by examining how dyads manage the collective stigma of infertility. Collective stigma assumes that since infertility impacts the lives of both members of the couple, they face stigma together. The ways that individuals negotiate this stigma together, and specifically the relational, as well as individual, outcomes of managing collective stigma are important to understand. As noted earlier, there is a cultural assumption that married couples will conceive, and when this does not happen one of the

partners, typically the woman, is to blame. However, medical research suggests there is a balance between infertility caused by male and female factors, thus partners deal with this diagnosis collectively and independently in equal amounts (Resolve, 2017). Therefore, it is imperative to study dyads to see how men and women differently experience infertility-related stigma, and the impact on individual and relational well-being. Finally, future research should investigate specific message features that perpetuate infertility-related stigma. Discovering the source of stigma is a beneficial first step toward minimizing its negative impact.

Despite the growing prevalence of infertility in the United States and around the world, there is still much to learn regarding how individuals communicate about the condition and the implications of this communication. The current study extends research on how various communicative variables influence fertility quality of life for infertile individuals. Specifically, the study found that although social support and stigma are negatively correlated, stigma negatively impacts fertility quality of life, with the potential for efficacy to mediate this association. Because stigma has such a significant negative influence on fertility quality of life, teaching practitioners and social network members how to communicate to decrease the perception of stigma has important benefits when coupled with teaching infertile individuals how to communicate more efficaciously in the face of stigma to mitigate the significant effects on their fertility quality of life.

References

Aarts, J. W. M., van Empel, I. W. H., Boivin, J., Nelen, W. L., Kremer, J. A. M., & Verhaak, C. M. (2011). Relationship between quality of life and distress in infertility: A validation study of the dutch fertiqol. *Psychology and Counseling, 26,* 1112-1118. doi:10.1093/humrep/der051

Afifi, W. A., & Afifi, T. D. (2009). Avoidance among adolescents in conversations about their parents' relationship: Applying the theory of motivated information management. *Journal of Social and Personal Relationships, 26,* 488-511. doi:10.1177/02654075509350869

Afifi, W. A., & Weiner, J. L. (2004). Toward a theory of motivated information management. *Communication Theory, 14,* 167-190. doi:10.1093/ct/14.2.167

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 31,* 143-164. doi:10.1177/1090198104263660

Berger, B. E., Ferrans, C. E., & Lashley, F. R. (2001). Measuring stigma in people with HIV: Psychometric assessment of the HIV stigma scale. *Research in Nursing & Health, 24,* 518-529. doi:10.1002.nur.10011

Berkman, L. F. (1995). Role of social-relations in health promotion. *Psychomatic Medicine, 57,* 245-254. doi:10.1097/00006842-199505000-00006

Bodie, G. D. (2011). The role of thinking in the comforting process: An empirical test of a dual-process framework. *Communication Research, 40,* 533-558. doi:10.1177/00936502

Boivin, J., Takefman, J., & Braverman, A. (2011a). The fertility quality of life (FertiQoL) tool: Development and general psychometric properties. *Human Reproduction, 26,* 2084-2091. doi:10.1093/humrep/der171

Boivin, J., Takefman, J., & Braverman, A. (2011b). The fertility quality of life (FertiQoL) tool: development and general psychometric properties. *Fertility and Sterility, 96,* 409-415.e2. doi:10.1016/j.fertnstert.2011.02.046

Bolger, N., Foster, M., Vinokur, A. D., & Ng, R. (1996). Close relationships and adjustment to a life crisis: The case of breast cancer. *Journal of Personality and Social Psychology, 70,* 283-294. doi:10.1037/0022-3514.70.2.283

Bos, A. E. R., Pryor, J. B., Reeder, G. D., & Stutterheim, S. E. (2013). Stigma: Advances in theory and research. *Basic and Applied Social Psychology, 35,* 1-9. doi:10.1080/01973533.2012.746147

Boudewyns, V., Himelboim, I., Hansen, D. L., & Southwell, B. G. (2015). Stigma's effect on social interaction and social media activity. *Journal of Health Communication, 20,* 1337-1345. doi:10.1080/10810730.2015.1018604

Bresnahan, M, & Zhuang, J. (2016). Detrimental effects of community-based stigma. *American Behavioral Scientist, 60,* 1283-1292. doi:10.1177/0002764216657378

Brod, M., Johnston, J., Able, S., & Swindle, R. (2006). Validation of the adult attention-deficit/hyperactivity disorder quality-of-life scale (AAQoL): A disease-specific quality-of-life measure. *Quality of Life Research, 15,* 117-129. doi:10.1007/s11136-005-8325-z

Burckhardt, C. S., & Anderson, K. L. (2003). The quality of life scale (QOLS): Reliability, validity, and utilization. *Health and Quality of Life Outcomes, 1,* 1-7. doi:10.1186/1477-7525-1-60

Burgener, S. C., Buckwalter, K., Perkhounkova, Y., & Liu, M. F. (2015). The effects of perceived stigma on quality of life outcomes in persons with early-state dementia: Longitudinal findings: Part 2. *Dementia, 14,* 609-632. doi:10.1177/1471301213504202

Burleson, B. R. (2009). Understanding the outcomes of supportive communication: A dual-process approach. *Journal of Social and Personal Relationships, 26,* 21-38. doi:10.1177/0265407509105519

Bute, J. J. (2013). The discursive dynamics of disclosure and avoidance: Evidence from a study of infertility. *Western Journal of Communication, 77,* 164-185. doi:10.1080/10570314.2012.695425

Carr, K., & Koenig Kellas, J. (2017). Examining the role of family and marital communication in understanding resilience to family-of-origin adversity. *Journal of Family Communication.* Advance online publication. doi:10.1080/15267431.2017.1369415

Checton, M. G., & Greene, K. (2012). Beyond initial disclosure: The role of prognosis and symptom uncertainty in patterns of disclosure in relationships. *Health Communication, 27,* 145-157. doi:10.1080/10410236.2011.571755

Chi, H., Park, I., Sun, H., Kim, J., & Lee, K. (2016). Psychological distress and fertility quality of life (FertiQoL) in infertile Korean women: the first validation study of korean fertiqol. *Clinical and Experimental Reproductive Medicine, 43,* 174-180. doi:10.5653/cerm.2016.43.3.174

Choi, S. Y., Venetis, M. K., Greene, K., Magsamen-Conrad, K., Checton, M. G., & Banerjee, S. C. (2016). Planning a stigmatized nonvisible illness disclosure: Applying the disclosure decision-making model. *The Journal of Psychology, 150,* 1004-1025. doi:10.1080/00223980.2016.1226742

Cohen, S., & Willis, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310-357. doi:10.1037/0033-2909.98.2.310

Dillow, M. R., & Labelle, S. (2014). Discussions of sexual health testing: Applying the theory of

motivated information management. *Personal Relationships, 21,* 676-691. doi:10.1111/pere.12057

Donarelli, Z., Lo Coco, G., Gullo, S., Salerno, L., Marino, A., Sammartano, F., & Allegra, A. (2016). The fertility quality of life questionnaire (FertiQoL) relational subscale: Psychometric properties and discriminant validity across gender. *Human Reproduction, 31,* 2061-2071. doi:10.1093/humrep/dew168

Donkor, E. S., & Sandall, J. (2007). The impact of perceived stigma and mediating social factors on infertility-related stress among women seeking infertility treatment in Southern Ghana. *Social Science & Medicine, 65,* 1683-1694. doi:10.1016/j.socscimed.2007.06.003

Earnshaw, V. A., Quinn, D. M., & Park, C. L. (2011). Anticipated stigma and quality of life among people living with chronic illnesses. *Chronic Illness, 8,* 79-88. doi:10.1177/1742395311429393

Gao, M., Ji, X., Zhou, L., Zhang, Z. (2016). *Translational Andrology and Urology, 5,* S56-S57. doi:10.21037/tau.2016.s084

Greene, K. (2009). An integrated model of health disclosure decision-making. In T. D. Afifi & W. A. Afifi (Eds.), *Uncertainty, information management, and disclosure decisions: Theories and applications,* (pp. 226-253). New York, NY: Routledge.

Greene, K., Derlega, V. J., Yep, G. A., & Petronio, S. (2003). *Privacy and disclosure of HIV in interpersonal relationships: A sourcebook for researchers and practitioners.* New York, NY: Routledge.

Greene, K., Magsamen-Conrad, K., Venetis, M. K., Checton, M. G., Bagdasarov, Z., & Banerjee, S. C. (2012). Assessing health diagnosis disclosure decisions in relationships: Testing the disclosure decision-making model. *Health Communication, 27,* 356-368.

doi:10.1080/10410236.2011.586988

Hayes, A. F. (2013). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from http://www.afhayes.com/public/process2012.pdf

High, A. C., & Steuber, K. R. (2014). An examination of support (in)adequacy: Types, sources, and consequences of social support among infertile women. *Communication Monographs, 81,* 157-178. doi:10.1080/03637751.2013.878868

Holubova, M., Prasko, J., Ociskova, M., Marackova, M., Grambal, A., & Slepecky, M. (2016). Self-stigma and quality of life in patients with depressive disorder: A cross-sectional study. *Neuropsychiatric Disease and Treatment, 12,* 2677-2687. doi:10.2147/NDT.S118593

Holzemer, W. L., Human, S., Arudo, J., Rosa, M. E., Hamilton, M. J., Corless, I., … & Maryland, M. (2009). Exploring HIV stigma and quality of life for persons living with HIV infection. *Journal of the Association of Nurses in AIDS Care, 20,* 161-168. doi:10.1016/j.jana.2009.02.002

Hoy-Ellis, C. P., Shiu, C., Sullivan, K. M., Kim, H., Sturges, A. M., & Fredriksen-Goldsen, K. I. (2016). Prior military service, identity stigma, and mental health among transgender older adults. *Gerontologist, 57,* S63-S71. doi:10.1093/geront/gnw173

Hsu, P., Lin, M., Hwang, J., Lee, M., Wu, M. (2013). The fertility quality of life (FertiQoL) questionnaire in Taiwanese infertile couples. *Taiwanese Journal of Obstetrics & Gynecology, 52,* 204-209. doi:10.1016/j.tjog.2013.04.009

Huppelschoten, A. G., Van Dongen, A. J. C. M., Verhaak, C. M., Smeenk, J. M. J., Kermer, J. A. M., and Nelen, W. L. D. M. (2013). Differences in quality of life and emotional status

between infertile women and their partners. *Health Communication, 28,* 2168-2176. doi:10.1093/humrep/det239

Indekeu, A., Rober, P., Schotsmans, P., Daniels, K. R., Dierickx, K., & D'Hooghe, T. (2013). How couples' experiences prior to the start of infertility treatment with donor gametes influence the disclosure decision. *Gynecologic and Obstetric Investigation, 76,* 125-132. doi:10.1159/000353901

Inhorn, M. C. (2004). Middle eastern masculinities in the age of new reproductive technologies: Male infertility and stigma in Egypt and Lebanon. *Medical Anthropology Quarterly, 18,* 162-182. doi:10.1525/maq.2004.18.2.162

Israel-Cohen, Y., Kaplan, O., Noy, S., & Kashy-Rosenbaum, G. (2016). Religiosity as a moderator of self-efficacy and social support in predicting traumatic stress among combat soldiers. *Journal of Religion and Health, 55,* 1160-1171. doi:10.1007/s10943-016-0187-x

Kamudoni, P., Mueller, B., & Salek, M. S. (2014). The development and validation of a disease-specific quality of life measure in hyperhidrosis: The hyperhidrosis quality of life index (HidroQoL). *Quality of Life Research, 24,* 1017-1027. doi:10.1007/s11136-014-0852-2

Klaassen, R. J., Barrowman, N., Merelles-Pulcini, M., Vichinsky, E. P., Sweeters, N., Kirby-Allen, M., … Young, N. L. (2013). Validation and reliability of a disease-specific quality of life measure (the TranQol) in adults and children with thalassaemia major. *British Journal of Haematology, 164,* 431-437. doi:10.1111/bjh.12631

Knoll, M., & Bronstein, J. (2013). An examination of the information disclosure behavior of infertility bloggers: Patterns of self-disclosure and anonymity. *Aslib Journal of Information Management, 66,* 175-201. doi:10.1108/AJIM-06-2013-0055

Lancaster, A. L., Dillow, M. R., Ball, H., Borchart, K., & Tyler, W. J. C. (2016). Managing

information about a romantic partner's relationship history: An application of the theory of motivated information management. *Southern Communication Journal, 81,* 63-78. doi:10.1080/1041794X.2015.1089926

Liu, H., Xu, Y., Lin, X., Shi, J., & Chen, S. (2013). Associations between perceived HIV stigma and quality of life at the dyadic lvel: The actor-partner interdependence model. *PLoS ONE, 8,* 1-7. doi:10.1371/journal.pone.0055680

Makoul, G., & Roloff, M. E. (1998). The role of efficacy and outcome expectations in the decision to withhold relational complaints. *Communication Research, 25,* 5-29. doi:10.1177/009365098025001001

Maroufizadeh, S., Ghaheri, A., Amini, P., & Samani, R. O. (2017). Psychometric properties of the fertility quality of life instrument in infertile Iranian women. *International Journal of Fertility and Sterility, 10,* 371-379.

Martins, M. V., Peterson, B. D., Costa, P., Costa, M. E., Lund, R., & Schmidt, L. (2012). Interactive effects of social support and disclosure on fertility-related stress. *Journal of Social and Personal Relationships, 30,* 371-388. doi:10.1177/0265407512456672

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin, 129,* 674-697. doi:10.1037/0033-2909.129.5.674

Morman, M. T., Schrodt, P., & Tornes, M. J. (2012). Self-disclosure mediates the effects of gender orientation and homophobia on the relationship quality of male same-sex friendships. *Journal of Social and Personal Relationships, 30,* 582-605. doi:10.1177/0265407512463991

Motl, R. W., McAuley, E., Snook, E. M., & Gliottoni, R. C. (2009). Physical activity and quality

of life in multiple sclerosis: Intermediary roles of disability, fatigue, mood, pain, self-efficacy and social support. *Psychology, Health, & Medicine, 14,* 111-124. doi:10.1080/13548500802241902

Ng, V., Nicholas, D., Dhawan, A., Yazigi, N., Ee, L., Stormon, M., … Otley, A. (2014). Development and validation of the pediatric liver transplantation quality of life: A disease-specific quality of life measure for pediatric liver transplant recipients. *Journal of Pediatrics, 165,* 547-555. doi:10.1016/j.jpeds.2014.05.024

Oetzel, J., Wilcox, B., Archiopoli, A., Avila, M., Hell, C., Hill, R., & Muhammad, M. (2014). Social support and social undermining as explanatory factors for health-related quality of life in people living with HIV/AIDS. *Journal of Health Communication, 19,* 660-675. doi:10.1080/10810730.2013.837555

Priem, J. S., & Solomon, D. H. (2015). Emotional support and physiological stress recovery: the role of support matching, adequacy, and invisibility. *Communication Monographs, 82*, 88-112. doi:10.1080/03637751.2014.971416

Rafferty, K. A., Cramer, E., Priddis, D., & Allen, M. (2015). Talking about end-of-life preferences in marriage: Applying the theory of motivated information management. *Health Communication, 30,* 409-418. doi:10.1080/10410236.2014.889555

RESOLVE. (2017). *Fast facts.* Retrieved from http://resolve.org/infertility-101/what-is-infertility/fast-facts/

Rosholm, R., Lund, R., Molbo, D., & Schmidt, L. (2010). Disclosure patterns of mode of conception among mothers and fathers-5-year follow-up of the copenhagen multi-centre psychosocial infertility (COMPI) cohort. *Human Reproduction, 25,* 2006-2017. doi:10.1093/humrep/deq153

Sexty, R. E., Hamadneh, J., Rösner, S., Strowitzki, T., Ditzen, B., Toth, B., & Wischmann, T. (2016). Cross-cultural comparison of fertility specific quality of life in German, Hungarian, and Jordanian couples attending a fertility center. *Health and Quality of Life Outcomes, 14,* 1-8. doi:10.1186/s12955-016-0429-3

Shin, Y., Joo, Y., & Kim, J. (2016). Self-perceived cognitive deficits and their relationship with internalized stigma and quality of life in patients with schizophrenia. *Neuropsychiatric Disease and Treatment, 12,* 1411-1417. doi:10.2147/NCT.S108537

Slade, P., O'Neill, C., Simpson, A. J., & Lashen, H. (2007). The relationship between perceived stigma, disclosure patterns, support, and distress in new attendees at an infertility clinic. *Human Reproduction, 22,* 2309-2317. doi:10.1093/humrep/dem115

Smith, R. A., Hernandez, R., & Catona, D. (2014). Investigating initial disclosures and reactions to unexpected, positive HPV diagnosis. *Western Journal of Communication, 78,* 426-440. doi:10.1080/10570314.2013.786120

Smith, R., Rossetto, K., & Peterson, B. L. (2008). A meta-analysis of disclosure of one's HIV-positive status, stigma, and social support. *AIDS Care, 20,* 1266-1275. doi:10.1080/09540120801926977

Sternke, E. A., & Abrahamson, K. (2015). Perceptions of women with infertility on stigma and disability. *Sexuality and Disability, 33,* 3-17. doi:10.1007/s11195-014-9348-6

Steuber, K. R., & High, A. (2015). Disclosure strategies, social support, and quality of life in infertile women. *Human Reproduction, 30,* 1635-1642. doi:10.1093/humrep/dev093

Steuber, K. R., & Solomon, D. H. (2008). Relational uncertainty, partner interference, and infertility: A qualitative study of disclosure within online forums. *Journal of Social and Personal Relationships, 25,* 831-855. doi:10.1177/0265407508096698

Steuber, K. R., & Solomon, D. H. (2011). Factors that predict married partners' disclosures about infertility to social network members. *Journal of Applied Communication Research, 39,* 250-270. doi:10.1080/00909882.2011.585401

Van Balen, F., Trimbos-Kemper, T., & Verdurmen, J. (1996). Perception of diagnosis and openness of patients about infertility. *Patient Education and Counseling, 28,* 247-252. doi:10.1016/0738-3991(95)00852-7

Venetis, M. K., Greene, K., Checton, M. G., Magsamen-Conrad, K. (2015). Decision making in cancer-related topic avoidance. *Journal of Health Communication, 20,* 306-313. doi:10.1080/10810730.2014.965364

Weber, K. D., & Patterson, B. R. (1996). Construction and validation of a communication based emotional support scale. *Communication Research Reports, 13,* 68-76. doi:10.1080/08824099609362072

Willis, E. (2016). Patient's self-efficacy within online health communities: facilitating chronic self-management behaviors through peer education. *Health Communication, 31,* 299-307. doi:10.1080/10410236.2014.950019

The Whoqol Group. (1998). The world health organization quality of life assessment (WHOQOL): Development and general psychometric properties. *Social Science & Medicine, 46,* 1569-1585. doi:10/1016/S0277-9536(98)00009-4

World Health Organization. (2016, October 21). *Multiple definitions of infertility.* Retrieved from http://www.who.int/reproductivehealth/topics/infertility/multiple-definitions/en/

Xu, Y., & Burleson, B. R. (2001). Effects of sex, culture, and support type on perceptions of spousal social support: An assessment of the "support gap" hypothesis in early marriage. *Human Communication Research, 27,* 535-566. doi:10.1093/hcr/27.4.535

Zeligman, M., Barden, S. M., & Hagedorn, W. B. (2016). Posttraumatic growth and HIV: A study on associations of stigma and social support. *Journal of Counseling and Development, 94,* 141-149. doi:10.1002/jcad.12071

Zhu, X., Smith, R. A., & Parrott, R. L. (2017). Living with a rare health condition: The influence of a support community and public stigma on communication, stress, and available support. *Journal of Applied Communication Research, 45,* 179-196. doi:10.1080/00909882.2017.1288292

Table 1

Descriptive Statistics and Pearson's Product-Moment Correlations or all Variables (*N* = 336)

Variables	*M (SD)*	1	2	3	4	5	6	7	8	9
1. Fertility Quality of Life	3.10 (0.71)	-	.41**	.36**	-.46**	-.07	.26**	.34**	.46**	.34**
2. General Communication-Based Support	3.31 (0.82)		-	.57**	-.57**	-.06	.44**	.39**	.46**	.36**
3. Specific Communication-Based Support	3.57 (0.96)			-	-.39**	-.00	.76**	.67**	.60**	.46**
4. Personalized Stigma	2.89 (1.01)				-	.05	-.30**	-.35**	-.43**	-.27**
5. Disclosure Concerns	2.67 (1.20)					-	-.07	-.08	-.22**	-.14*
6. Communication Efficacy	5.05 (1.85)						-	.68**	.57**	.40**
7. Target Efficacy	5.13 (1.38)							-	.52**	.36**
8. Coping Efficacy	4.66 (1.54)								-	.43**
9. Confrontation Efficacy	3.15 (1.26)									-

Note. Communication efficacy, target, coping, and confrontation efficacies were measured on a 7-point Likert scale. Fertility quality of life, communication-based emotional support, personalized stigma, and disclosure concerns were measured on a 5-point Likert scale. * $p < .05$, ** $p < .01$

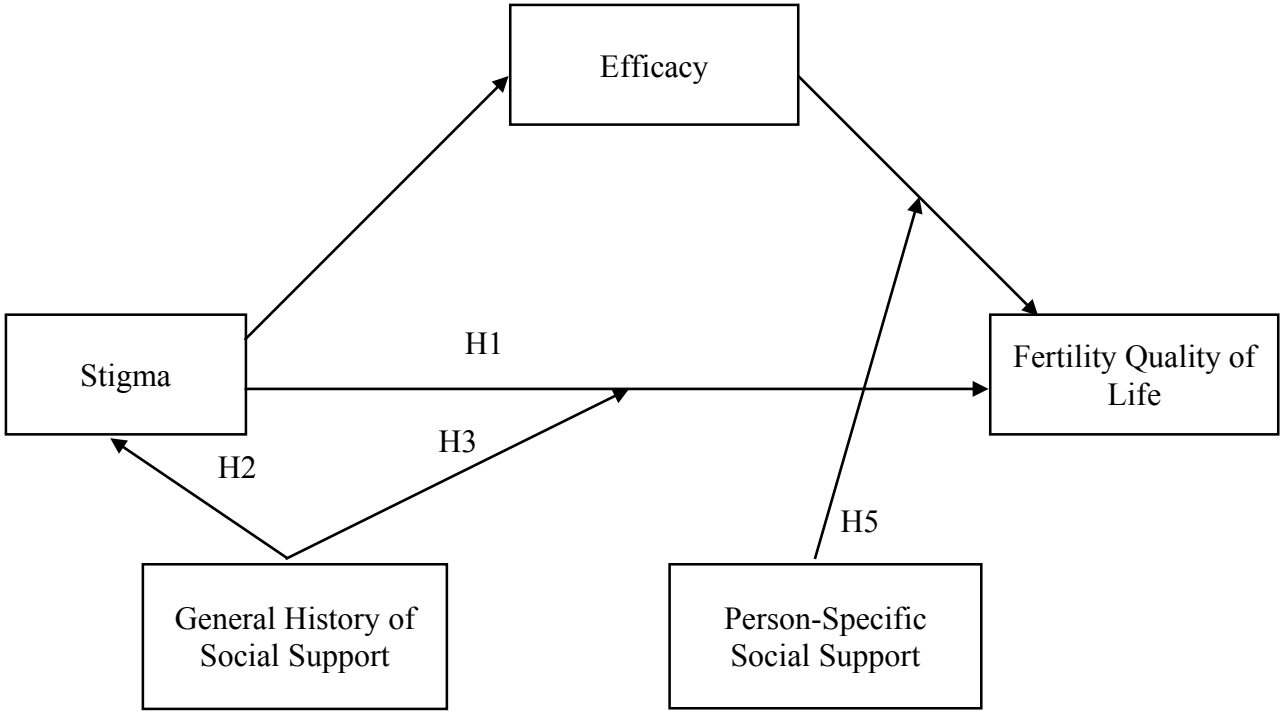

Figure 1. Conceptual model for the effect of stigma, efficacy, and social support on fertility quality of life. Although not shown here, H4 tests the degree to which infertility-related efficacy mediates the association between stigma and fertility quality of life

Table 2

Indirect Effects of Stigma on Fertility Quality of Life through Efficacy (N = 238)

					Consequent			
		M (Efficacy)				Y (FertiQoL)		
Antecedent		Coeff.	*SE*	CI (Lower, Upper)		Coeff.	*SE*	CI (Lower, Upper)
X (Stigma)	a	-.566**	.088	-.740 to -.393	c'	-.168**	.051	-.270 to -.067
M (Efficacy)		—	—	—	b	.191**	.035	.122 to .260
constant	i_1	6.097**	.256	5.592 to 6.601	i_2	2.62**	.254	2.121 to 3.121
		R^2 =.149				R^2 = .214		
		F (1, 236) = 41.235, p < .001				F (2, 235) = 31.980 p < .001		

Note. Stigma = Perceived infertility-related stigma. Efficacy = Total efficacy composite. FertiQoL = Fertility Quality of Life. CI = 90% Bias corrected confidence intervals for unstandardized effects based on 10,000 bootstrap samples. Indirect effect sizes for the mediation paths were calculated in PROCESS using the ratio of the indirect to total effect. **p < .001.

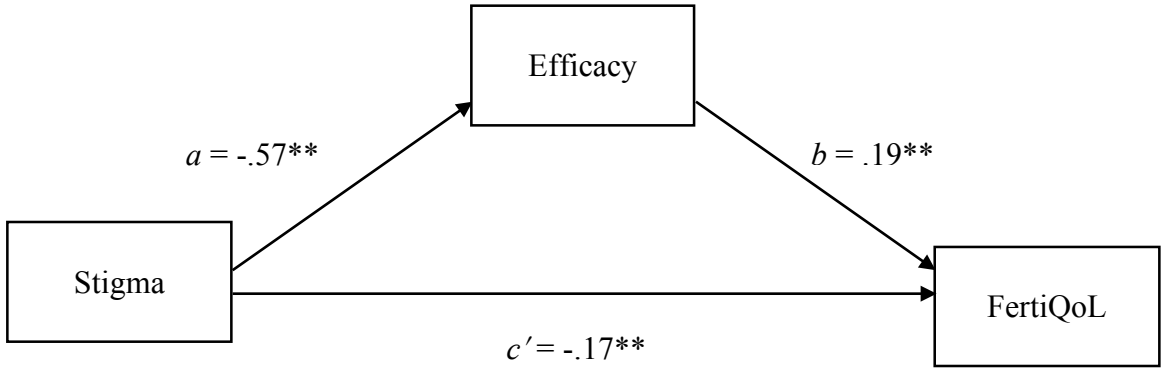

Figure 2. Simple mediation model for efficacy. ** = p < .00

Appendix

Qualtrics Survey

Note. Survey format may change slightly during online conversion

General Directions: Please select the most appropriate response to each question. If there are a separate set of directions, please read those carefully and answer each question according to the directions for that section of the questionnaire.

1. **Fertility Quality of Life Questionnaire (2008)** (Boivin et al., 2011)
   Directions: For each question, kindly click (tick the box) for the response that most closely reflects how you think and feel. Relate your answers to your current thoughts and feelings. Some questions may relate to your private life, but they are necessary to adequately measure all aspects of your life. **Please complete the items marked with an asterisk (*) if you have a partner.**

Very Poor	Poor	Neither Good Nor Poor	Good	Very Good
1	2	3	4	5

1. How would you rate your health?

Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

2. Are you satisfied with your quality of life?

Completely	A Great Deal	Moderately	Not Much	Not At All
1	2	3	4	5

1. Are your attention and concentration impaired by thoughts of infertility?
2. Do you think you cannot move ahead with other life goals and plans because of fertility problems?
3. Do you feel drained or worn out because of fertility problems?
4. Do you feel able to cope with your fertility problems?

Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

5. Are you satisfied with the support you receive from friends with regard to your fertility problems?
6. Are you satisfied with your sexual relationship even though you have fertility problems? *

Always	Very Often	Quite Often	Seldom	Never
1	2	3	4	5

7. Do your fertility problems cause feelings of jealousy and resentment?
8. Do you experience grief and/or feelings of loss about not being able to have a child (or more children)?
9. Do you fluctuate between hope and despair because of fertility problems?
10. Are you socially isolated because of fertility problems?
11. Are you and your partner affectionate with each other even though you have fertility problems? *
12. Do your fertility problems interfere with your day-to-day work or obligations?
13. Do you feel uncomfortable attending social situations like holidays and celebrations because of your fertility problems?
14. Do you feel your family can understand what you are going through?

An Extreme Amount	Very Much	A Moderate Amount	A Little	Not At All
1	2	3	4	5

15. Have fertility problems strengthened your commitment to your partner? *
16. Do you feel sad and depressed about your fertility problems?
17. Do your fertility problems make you inferior to people with children?
18. Are you bothered by fatigue because of fertility problems?
19. Have fertility problems had a negative impact on your relationship with your partner? *
20. Do you find it difficult to talk to your partner about your feelings related to infertility? *
21. Are you content with your relationship even though you have fertility problems? *
22. Do you feel social pressure on you to have (or have more) children?
23. Do your fertility problems make you angry?
24. Do you feel pain and physical discomfort because of your fertility problems?

2. History of Fertility Related Social Support

Communication-Based Emotional Support (Weber & Patterson, 1996)
Directions: Thinking generally about conversations you have had with members of your social network (i.e., friends, family, coworkers, etc.) in the past about your infertility, indicate the extent to which you agree with each statement below.

1	2	3	4	5
Strongly disagree	Generally disagree	Undecided	Generally agree	Strongly agree

1. These people helped me work through my thoughts and feelings about decisions concerning my infertility
2. These people patiently and sensitively listened to me talk about my infertility.
3. When I discussed my infertility with these people, they didn't seem to pay attention. (R).
4. These people helped me cope with my infertility by offering help if I needed it and suggesting possible options.
5. These people avoided me when I was depressed about my infertility. (R)
6. These people listened to me talk about my infertility without judging me.
7. These people said and did supportive things for me when I was feeling down about my infertility.

8. When I wanted to talk to these people about what was bothering me about my infertility, they seemed to have something else to do. (R)
9. These people showed genuine concern for my infertility.
10. These people gave me good advice about my infertility when I asked for it.
11. These people made it very easy to discuss my personal feelings about my infertility.
12. These people listened to my side of the story about my infertility, even if they thought I was wrong.
13. These people made an effort to make me feel better when I was depressed.

Quality of Social Support (Goldsmith, McDermott & Alexander, 2000)
Directions: Thinking generally about conversations you have had with members of your social network (i.e., friends, family, coworkers, etc.) in the past about your infertility, how would you rate their advice?

helpful	X	X	X	X	X	hurtful (R)
useless	X	X	X	X	X	useful
ignorant	X	X	X	X	X	knowledgeable
selfish	X	X	X	X	X	generous
supportive	X	X	X	X	X	unsupportive (R)
upsetting	X	X	X	X	X	reassuring
comforting	X	X	X	X	X	distressing (R)
encouraging	X	X	X	X	X	discouraging (R)
sensitive	X	X	X	X	X	insensitive (R)
heartless	X	X	X	X	X	compassionate
considerate	X	X	X	X	X	inconsiderate (R)
misunderstanding	X	X	X	X	X	understanding

3. **Personalized Stigma** (Steuber & Solomon, 2011; adapted from Berger, Ferrans, & Lashley, 2001)
Directions: Thinking generally about your current or past infertility, indicate how much you agree with each statement.

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

1. I have been hurt by how people react to learning we are infertile.
2. I have stopped socializing with some people due to their reaction towards infertility.
3. People I care about stopped calling after learning we are infertile.
4. Some people who know we are infertile have grown more distant.

4. **Disclosure Concerns** (Steuber & Solomon, 2011; adapted from Berger, Ferrans, & Lashley, 2001)
Directions: Thinking generally about your disclosures of your current or past infertility, indicate how much you agree with each statement.

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

1. I worry that other people who know we are infertile will tell others.
2. I am very careful whom I tell we are infertile.
3. I work very hard to keep our infertility a secret.
4. In many areas of my life, no one knows we are infertile.

Directions: In this section, you will be asked to think about the way you talk/have talked about your infertility with other people in your life. First, please take a moment to remember the most recent conversation in which you talked about your infertility to another person.

5. In the space below, please briefly describe a recent conversation you had with another person about your current or prior infertility.

[Text Box Here]

6. Thinking of the person with whom you have discussed your infertility recently, is this person your:

1. Friend
2. Romantic Partner/Spouse
3. Mother
4. Father
5. Brother
6. Sister
7. Mother-in-Law
8. Father-in-Law
9. Sister-in-Law
10. Brother-in-Law
11. Grandmother
12. Grandfather
13. Aunt
14. Uncle
15. Other familial relationship (please specify): _____
16. Coworker
17. Acquaintance
18. Other (please specify) _____

7. What is the sex of this person with whom you have recently discussed your infertility?
   1. Male
   2. Female

8. Is the person with whom you have recently discussed your infertility a family member other than your spouse/romantic partner?

1. Yes
2. No

Directions: Thinking about the conversation you just described, select the bubble that most accurately describes your feelings when talking about your infertility with [person].

7. Communication Efficacy (Afifi & Afifi, 2009; adapted from Rafferty et al., 2015)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. I am able to talk about my infertility to my [person].
2. I could approach my [person] to ask about his/her views on infertility.
3. I am able to approach my [person] to talk about infertility.

8. Target Efficacy (Afifi & Afifi, 2009)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. My [person] is completely honest in his/her response to my infertility.
2. My [person] gives me truthful information about my infertility.
3. My [person] is completely forthcoming about my infertility.
4. If approached, my [person] is upfront about my infertility.

9. Coping Efficacy (Afifi & Afifi, 2009; adapted from Rafferty et al., 2015)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. I feel confident that I can cope with all reactions to my infertility disclosures.
2. I can't deal with the way my [person] may react to my infertility disclosures. (R)
3. I can handle whatever reaction I receive in response to my infertility disclosures.
4. I am not able to deal with the way my [person] reacts to my infertility disclosure. (R)

10. Confrontation Efficacy (Steuber & Solomon, 2011; adapted from Makoul & Roloff, 1998)

Very Strongly Disagree	Strongly Disagree	Disagree	Agree	Strongly Agree	Very Strongly Agree
1	2	3	4	5	6

1. It is very easy for me to initiate a discussion with my [person] about something they did that irritated me regarding my infertility.
2. It is very easy for me to ask my [person] to change their behavior in reference to my infertility.
3. I do not have trouble asking my [person] to stop doing things that irritate me related to my infertility.
4. I have no trouble reminding my [person] of something they did that irritated me during my infertility experience.

11. Communication-Based Emotional Support (Adapted from Weber & Patterson, 1996)

Directions: Thinking about your conversation with [person], indicate the extent to which you agree with each statement below.

Strongly Disagree	Generally Disagree	Undecided	Generally Agree	Strongly Agree
1	2	3	4	5

1. [Person] helped me work through my thoughts and feelings about decisions concerning my infertility.
2. [Person] patiently and sensitively listened to me talk about my infertility.
3. When I discussed my infertility with [person], he/she didn't seem to pay attention. (R).
4. [Person] helped me cope with my infertility by offering help if I needed it and suggesting possible options.
5. [Person] avoided me when I was depressed about my infertility. (R)
6. [Person] listened to me talk about my infertility without judging me.
7. [Person] said and did supportive things for me when I was feeling down about my infertility.
8. When I wanted to talk to [person] about what was bothering me about my infertility, he/she seemed to have something else to do. (R)
9. [Person] showed genuine concern for my infertility.
10. [Person] gave me good advice about my infertility when I asked for it.
11. [Person] made it very easy to discuss my personal feelings about my infertility.
12. [Person] listened to my side of the story about my infertility, even if he/she thought I was wrong.
13. [Person] made an effort to make me feel better when I was depressed.

12. Quality of Social Support (Goldsmith, McDermott & Alexander, 2000)
Directions: Thinking about the conversations you've had with [person] about your infertility, how would you rate their advice?

helpful	X	X	X	X	X	hurtful (R)
useless	X	X	X	X	X	useful
ignorant	X	X	X	X	X	knowledgeable
selfish	X	X	X	X	X	generous
supportive	X	X	X	X	X	unsupportive (R)

upsetting	X	X	X	X	X	reassuring
comforting	X	X	X	X	X	distressing (R)
encouraging	X	X	X	X	X	discouraging (R)
sensitive	X	X	X	X	X	insensitive (R)
heartless	X	X	X	X	X	compassionate
considerate	X	X	X	X	X	inconsiderate (R)
misunderstanding	X	X	X	X	X	understanding

13. Demographics

Directions: Please type in or select the most appropriate response to each question.

1. What is your age? _____

2. What is your biological sex?
   1 Male
   2 Female
   3 Prefer not to say

3. What is your ethnicity or race?
   1 White
   2 African American
   3 Hispanic American
   4 Native American
   5 Asian American
   6 Other (please specify): _____
   7 Prefer not to say

4. What is your current marital status?
   1 Single/Never married
   2 Married/Domestic Partnership
   3 Divorced
   4 Widowed
   5 Prefer not to say

5. Do you currently qualify yourself as being infertile?

   1 Yes (move to #7)
   2 No (move to #6)

6. (Only shown if participant answered "no" to #5) When you did qualify yourself as infertile, how long did it take you and your partner to successfully conceive? (ex: 2 years 7 months)

   _____ Years _____ Months
   1 We were not able to successfully conceive

7. (Only shown if participant answers "yes" to #5) How long have you and your partner been trying to conceive? (ex: 2 years 7 months)

_____ Years _____ Months

8. Have you been medically diagnosed as being infertile (i.e., by a medical doctor)?

1 Yes
2 No

9. Do you currently have any children?

1 Yes
2 No

10. If yes, how are you related to your children?

1 Biological
2 Through marriage
3 Through adoption
4 Gestational carrier
5 Surrogate
6 Other: _____

Thank you for participating in this research! As a reminder, all of your responses are completely confidential. If you would like to enter your email address for a chance to win a $25 Amazon gift card, please click on the link below. The information you enter will not be associated with your responses.