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Social Anxiety, Quality of Life, and Healthy Lifestyle Behaviors of Women With Infertility Problems

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MA, Çapa Medical Faculty, 2010

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

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Abstract

Not having a child has significant psychosocial effects on women experiencing infertility problems. There is a gap in research on social anxiety, quality of life, and healthy lifestyle behaviors of women during infertility, fertility treatment, and subsequent pregnancy. The purpose of this quantitative comparative study was to investigate the social anxiety, quality of life, and healthy lifestyle behaviors of Turkish women with infertility issues and Turkish women who conceived after infertility treatment, as measured by the Liebowitz Social Anxiety Scale, the Fertility Quality of Life Questionnaire, and the Healthy Lifestyle Behavior Scale II. The social support and stress buffering theory and the health promotion model provided the framework for the study. Mann-Whitney U tests were used to evaluate 200 women undergoing infertility treatment and women who conceived after infertility treatment on social anxiety, quality of life, and healthy lifestyle behaviors. The results indicated that women undergoing infertility treatment had higher social anxiety and avoidance and higher nutritive healthy lifestyle behaviors than women who conceived after infertility treatment. There was no difference in quality of life between the groups. Findings may promote a better understanding of social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment. This heightened awareness may be used to increase psychosocial well-being of women and may increase the success rate of infertility treatment.

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Dedication

I dedicate this work to the U.S. education system, Walden University, all instructors, and especially Dr. Steven Little. If there was not an online system, I could not be graduating with a doctorate in clinical psychology from a U.S. university. I dedicate this work to my father, a dream man whom all girls want to have, but sorry he is mine. He is the one who provides the opportunity to accomplish impossible things during my life, trusting and supporting me without any discouragement. Also, I am thankful for my emotional father, Sami Katırcıoğlu, who is a world role model as a responsive and productive professional person who becomes a beneficiary for family and society. Thanks for my son for always supporting my education even with tears in his eyes. I also dedicate to Şişli Memorial Hospital Prof. Dr. Semra Kahraman, and Yasemin Güler, who helped me to collect data. I dedicate this to my mom, Belkıs, and my emotional mother, Melda, who always encouraged me to be a strong woman and not fall down even when faced with difficulties and obstacles. Special dedication for my sister, the one who taught me that education is the only way to actualize yourself. My brother and his special wife also gain a dedication with their unlimited encouragement. To the memory of my dear nephew, Merve, we wish to be together with you on my graduation, but unfortunately I will have to wait to see you again in heaven. Huge thanks for my mother in law who carried my children when I was far away from them to write my dissertation. Of course I will not forget my ex husband because he was the one to provide me obstacles and let me use my resilience I want to add every single system and person who helped me to be at this point, but there is no more space.

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Chapter 1: Introduction to the Study

Having a child is an expectation for most married couples and a norm for some communities (Erdem & Apay, 2014). Some married couples have difficulty conceiving children due to infertility problems. The World Health Organization (WHO, 2015) defined *infertility* as a failure to get pregnant after 12 months or more in a regular unprotected sexual relationship. According to the WHO (2015), 48.5 million couples have infertility problems worldwide. In addition, 10.5% of women have secondary infertility (infertile after one child), and 2% have primary infertility (no children) (Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012). Researchers have reported the rate of infertility in couples as between 10 and 20% in Turkey (Arıcı, Attar, Balaban, Buyru, & Çolgar, 2006). Given the increased population having infertility problems, ways to increase the ratio of successful infertility treatment are needed (Ombelet, 2011).

In addition to medical professionals, mental health professionals have focused on how to increase successful infertility treatment with the improvement in affected physical, sociological, and psychological issues on couples who want to have a baby (Homan, Davies, & Norman, 2007). Literature showed that infertility treatment has a large effect on social anxiety, quality of life, and healthy lifestyle behaviors (Chomitz, Cheung, & Lieberman, 1995; Dejin-Karlsson, & Ostergren, 2004; Sharma, Biedenharn, Fedor, & Agarwal, 2013). In addition, infertility has adverse effects on marriage, relationships, and psychological well-being.

The current study conducted to increase awareness of the experiences of women and to examine the effect of social anxiety, quality of life, and healthy lifestyle behaviors on women with infertility problems and those who conceived after infertility treatment by using validated and reliable measures in a Turkish population (see Sezgin & Hocaoglu, 2014; Uğur, 2014). The findings may be used to increase professional and public awareness of infertility and its impact on mental health concerns. Also, the study may motivate researchers to consider more culturally sensitive screening and develop programs to better educate women on social, mental, and physical factors related to fertility.

The study's outcome may lead professionals to provide psychoeducational programs to women who have applied to fertility clinics to lessen infertility by implementing social, physical, and psychological well-being techniques into their life. As a result of the implementation of the information learned from trainings, mothers may experience higher success rates of fertility treatments in the Turkish population. In this chapter, I present the background of the problem, the problem statement, the purpose of the study, the research questions, the theoretical framework of the study, the nature of the study, definitions, assumptions, limitations, and significance of the study.

Background

Social Anxiety

Social anxiety is one of the significant components to having psychological well-being during the infertility process. Women who have infertility problems may avoid social environments of women who have children or who are pregnant (Kırca & Pasinlioğlu, 2013). In addition to self-pressure, women are also under societal pressure. Because their infertility issue is significant, they may keep it secret, leading to isolation and insufficient social support (Kılıç, Ejde Apay, & Kızılkaya Beji, 2011; Kırca & Pasinlioğlu, 2013; Saydam, 2003). Self-pressure and social pressure may cause women to feel guilty, inadequate, depressive, isolated, rejected, marginalized, and anxious, and to experience marital infidelity, domestic violence, and threats of divorce (Demirci, 2001; Klock, 2011; Öztürk, 2011; Topdemir Koçyiğit, 2012; Women's Health Council, 2009). Social anxiety may lead to additional psychological and sociological obstacles in women's lives and relationships due to infertility problems (Kılıç et al., 2011; Kırca & Pasinlioğlu, 2013).

Quality of Life

Literature showed that quality of life of women with infertility issues has been affected negatively (Bolsoy, Taspinar, Kavlak, & Sirin, 2010; Chachamovich et al., 2010; Chura & Norman, 2007; Drosdzol & Skrzypulec, 2008; Fekkes et al., 2003; Frey & Patel, 2004; Guido et al., 2005; Jose-Miller, Boyden, & Frey, 2007; Lau et al., 2008; Monga, Alexandrescu, Katz, Stein, & Ganiats,

2004; Rashidi et al., 2008; Teskereci & Öncel, 2013). Fertility-related quality of life is defined as the quality in overall physical health, satisfaction, personal, interpersonal, and optional treatments during the infertility process. Quality of life decreases with advanced age (Bolsoy et al., 2010; Khayata, Rizk, Hasan, Ghazal-Aswad, & Asaad, 2003; Kuş, 2008), lower education level (Chachamovich et al., 2010), prolonged duration of infertility (Kuş, 2008), primary infertility (Johansson et al., 2009), female-factor infertility (Khayata et al., 2003), unsuccessful experience of in vitro fertilization (Ragni et al., 2005), lower income (Aliyeh & Laya, 2007; Bolsoy et al., 2010; Lau et al., 2008), extended family structure (Bolsoy et al., 2010; Kuş, 2008), and history of gynecologic surgery (Chachamovich et al., 2007; Fekkes et al., 2003).

Healthy Lifestyle Behaviors

Healthy lifestyle behaviors are the other significant factor to consider during infertility treatment because literature showed that although the opposite is expected, women may have more unhealthy lifestyle behaviors during infertility treatment (Sezgin & Hocaoglu, 2014). Healthy lifestyle behaviors include health responsibility, physical activity, nutrition, mental development, interpersonal relationships, and stress management (Demirci, Coşkuner Potur, Gün, & Çakır, 2016). It is better for women to be careful about their and their infants' health responsibility, and to have optimum physical activity, healthy nutrition, supportive interpersonal relationships, and functional stress management tools during infertility treatment. To help embryos attach to the endometrium and ensure a healthy pregnancy, women have to change their daily life rituals and behaviors and have healthy lifestyle behaviors such as good nutrition, increased activity level, and balanced sleep and work hours (Dejin-Karlsson & Ostergren, 2004; Sharma et al., 2013). By implementing those changes, women can increase the likelihood of getting pregnant (European Society of Human Reproduction and Embryology, 2018). Literature also showed that quality of life has a positive relationship with healthy lifestyle behaviors and has a relationship with the success of the infertility treatment (Onat & Kızılkaya Beji, 2012; Sezgin & Hocaoglu, 2014; Teskereci & Öncel, 2013).

Although studies have shown the psychological impact of infertility problems and the treatment effect on women, the effect of social anxiety, quality of life, and healthy lifestyle behaviors in women undergoing infertility treatment and women who conceived after infertility treatment has not been studied in Turkey. A better understanding of the effect of social anxiety, quality of life, and healthy lifestyle on infertility issues may enable women to have more successful fertility outcomes (Karlıdere et al., 2008; Slade, Emery, & Lieberman, 1997). There was also a need to examine those variables using valid and reliable measurement tools in the Turkish population (see Sezgin & Hocaoglu, 2014; Ugur, 2014).

This study may fill a gap in the literature by focusing on the social anxiety, quality of life, and healthy lifestyle behaviors of women with infertility and comparing the results with women who conceived after infertility treatment. This study was unique because it addressed an underresearched area. Researchers had not compared the social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment and women who conceived after infertility treatment in Turkey.

Problem Statement

Not having a baby after 1 year of unprotected sex has many negative effects on women's psychological, social, environmental, and physical well-being (Kılıç et al., 2011). Because having a baby is significant, infertility treatments have been developed and are effective in increasing the ratio of successful pregnancy and birth. However, there remain many variables to assess, evaluate, and organize on the psychological side of this bidirectional infertility problem specific to cultures or countries such as Turkey (Kazandi, Gunday, Mermer, Erturk, & Ozkınay, 2011; Kırca & Pasinlioğlu, 2013). Social factors and effectiveness have to be evaluated in people who have infertility problems. Only one study had addressed the social anxiety and avoidance of women having polycystic ovary syndrome, so there was a need to examine more groups of people having infertility problems (Açmaz et al., 2013). Also, there were few studies addressing healthy lifestyle behaviors of women undergoing infertility treatment in Turkey (Altıntop & Kesgin, 2018; Kılıç et

al., 2011; Kırca & Pasinlioğlu, 2013; Mirghafourvand, Sehhati, & Rahimi, 2014; Rooney & Domar, 2014; Yurdagül & Oltuluoğlu, 2012). Researchers suggested that the best thing for women who want to get a baby is to assess their psychological needs and start it in the preconceptional period (Demir & Kızılkaya Beji, 2016; Zeren, 2016). Women have to be evaluated with assessments that include physical, cognitive, and social aspects such as social anxiety, quality of life, and healthy lifestyle behaviors scales (Demirci et al., 2016).

There were also methodological recommendations from the current literature about these variables. Yıldırımlı and Korkut (2015) recommended to collect data by face to face rather than online program or webbased data collection sites and also collect data from different socioeconomic strati to obtain more generalizable results. Kazandi et al. (2011) added that socioeconomic status and cultural and religious factors should also be examined.

In the current study, I addressed the gap in the literature regarding the effect of social anxiety, quality of life, and healthy lifestyle behaviors in women undergoing infertility treatment compared to women who conceived after infertility treatment. This research may contribute to more culturally sensitive screening, evaluating, expecting, and training approaches with an emphasis on medical and psychological professionals, women, men, and couples in the Turkish population and worldwide. This study may provide empirical evidence for professionals and women to apply for infertility treatment or pregnancy controls to identify early warning signs of high social anxiety, low quality of life, and unhealthy lifestyle behaviors.

Purpose of the Study

The purpose of this quantitative comparative research study was to determine whether social anxiety, quality of life, and healthy life style behaviors of women undergoing infertility treatment are different compared to women who conceived after infertility treatment. There was one independent variable with two levels (women undergoing infertility treatment and women who conceived after infertility treatment) and three dependent variables (social anxiety, quality of life, and healthy life style behaviors).

Research Questions and Hypotheses

The purpose of this quantitative comparative study was to answer the following research questions:

Research Question 1: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score?

H_o1: Women undergoing infertility treatment do not have higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score as measured by Liebowitz Social Anxiety Scale.

H_a1: Women undergoing infertility treatment have higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score as measured by Liebowitz Social Anxiety Scale.

Research Question 2: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the Fertility Quality of Life subscales and the overall quality of life score?

H_o2: Women undergoing infertility treatment do not have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score as measured by Fertility Quality of Life Questionnaire.

H_a2: Women undergoing infertility treatment have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score as measured by Fertility Quality of Life Questionnaire.

Research Question 3: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score?

H_o3: Women undergoing infertility treatment do not have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style

subscales and the overall healthy lifestyle behaviors score as measured by Healthy Lifestyle Behavior Scale II.

H_a3: Women undergoing infertility treatment have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score as measured by Healthy Lifestyle Behavior Scale II.

Theoretical Framework

One of the theoretical bases for this study was the social support and stress buffering theory in which social support is a significant determinant on coping with stressful events (see Cobb, 1976). Social support is a lifelong process in which individuals feel cared for, valued, and attached to others in a network system. According to Cobb (as cited in Cohen & Pressman, 2004), people's social support type and system change through their lifetime, and it becomes more important at the time of crisis. The literature showed that having infertility problems may cause women to feel grief, shame, and isolation, and they may not be able to talk about their problem with friends or family members (Jessup, 2005). Women might also struggle with infertility-related self-esteem, self-isolation, socialization problems, or other life issues (Cohen & Pressman, 2004). Infertility is a life crisis that might cause women to have impaired social functioning and impaired social cognition as a result of social phobia (Ditzen & Heinrichs, 2014). Because social support is mostly associated with a stress buffering tool, women with infertility issues might be deprived of social support because of their social anxiety caused by impaired social cognition (Ditzen & Heinrichs, 2014). The social support and stress buffering theory may be used to explain the relationship between social anxiety that women undergoing infertility treatment experience compared to women who conceived after infertility treatment (see Cohen & McKay, 1984; Steuber & High, 2015).

Conceptual Framework

The conceptual framework for this study was the health promotion model developed and revised by Pender (Pender, Murdaugh, & Parsons, 2002). According to the health promotion model,

the interaction among individual characteristics, experiences, and behavioral outcomes has an effect on health status and quality of life. İndividual characteristics are unchangeable factors such as age, ethnicity, or menopausal status (Pender et al., 2002). Behavioral outcomes are results of the lifestyle choices (Pender et al., 2002). Women's awareness of social anxiety, quality of life, and unhealthy lifestyle behaviors is significant in reaching their goal of getting pregnant and having a healthy baby after infertility treatment (European Society of Human Reproduction and Embryology, 2018). To provide accurate training or interventions, researchers have to assess and understand the influence of social anxiety, quality of life, and healthy lifestyle behaviors on fertility. To gain a better understanding the relationship between these factors, I used Pender's health promotion model. The health promotion model indicates that having good mental and physical health provides a higher quality of life, and higher quality of life leads to healthier lifestyle behaviors (Pender et al., 2002). The health promotion model includes variables such as the quality of life and healthy lifestyle behaviors. The major theoretical propositions of the social support and stress buffering theory and the health promotion model are discussed in more detail in Chapter 2.

Nature of the Study

This study was a quantitative comparison of social anxiety, quality of life, and healthy lifestyle behaviors in women undergoing infertility treatment compared to women who conceived after infertility treatment. The study included one independent variable with two levels (women undergoing infertility treatment and women who conceived after infertility treatment) and three dependent variables (social anxiety, quality of life, and healthy lifestyle behaviors). Participant selection criteria included being Turkish, being married, being at least 18 years old, and being infertile with no children, diagnosed as infertile, undergoing infertility treatment, or having conceived after infertility treatment.

All participants completed the same surveys in the survey package. The package contain the informed consent, demographic form, Leibowitz Social Anxiety Scale, Fertility Quality of Life Scale, Healthy Lifestyle Behavior Scale–II, thank you letter, and a list of psychological support

services. The data were analyzed using a two-way MANOVA to determine the functional relationship between social anxiety, quality of life, and healthy lifestyle behaviors. All statistical analysis was conducted using the SPSS program Version 25.

Definitions

The following terms are defined as they were used throughout this study:

Assisted reproductive technology (ART): All treatments or procedures that include the in vitro handling of human oocytes and sperm or embryos for the purpose of establishing a pregnancy. This includes but is not limited to in vitro fertilization (IVF) and transcervical embryo transfer, gamete intra-Fallopian transfer, zygote intra-Fallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation, and gestational surrogacy. ART does not include assisted insemination (artificial insemination) using sperm from either a woman's partner or sperm donor (Centers for Disease Control and Prevention, 2015; Nargund, 2011).

Healthy lifestyle behaviors: A multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual (Walker, Sechrist, & Pender, 1987).

Infertility: The inability to get pregnant after 1 full year of having regular unprotected sex (Ali, Ebraheem, & Mohamed, 2013; WHO, 2015).

Intracytoplasmic sperm injection (ICSI): An IVF procedure in which a single spermatozoon is injected through the zona pellucida into the oocyte (Nargund, 2011).

In-vitro fertilization (IVF): A laboratory procedure in which fertilization is attempted by placing many sperm cells in unfertilized eggs (Covington & Burns, 2006).

Polycystic ovarian syndrome (PCOS): An endocrine-metabolic disorder characterized by multiple hormonal imbalances reflecting a clinical presentation dominated by manifestations of hyperandrogenism, which generate short- and long-term consequences for female health (Rojas et al., 2014).

Quality of life: "How well human needs are met, or the extent to which individuals or groups perceive satisfaction or dissatisfaction in various life domains" (Costanza et al., 2007, p. 269).

Social anxiety: "A persistent fear of interacting or performing in social situations due to concerns of embarrassment, humiliation, or negative evaluation by others" (Baker, Heinrichs, Kim, & Hofmann, 2002, p. 701). Social anxiety is previously known as "neglected anxiety disorder" (Liebowitz, Gorman, Fyer, & Klein, 1985), p. X).

Assumptions

I assumed I would be able to obtain an adequate sample. I also assumed that the participants would understand the survey questions and would answer all questions honestly. I assumed participants would complete all surveys at one time in the clinic rather than taking the packets outside of the clinic. I also assumed that the instruments selected for this study were valid and reliable measures that had been standardized on populations with characteristics similar to participants in the current study.

Scope and Delimitations

The participants of this study were women undergoing infertility treatment and women who conceived after infertility treatment living in Turkey. Participants were limited to women age 18 and over, married, and educated through at least primary school in the Turkish language. Men were excluded from the study because studies showed that women experience more social difficulties and stress compared to their male partners (Damti, Sarid, Sheiner, Zilberstein, & Cwikel, 2008; Deka & Sarma, 2010; Fledderjohann, 2011).

A quantitative comparative research design used to compare two groups with one or more variables. In this study, the two groups were women undergoing infertility treatment and women who had conceived after infertility treatment. Variables to compare those groups were social anxiety, quality of life, and healthy lifestyle behaviors.

Limitations

There were limitations in this study. One of the limitations was that all scales were self-reported measures without any clinical interview. Also, participants might have given responses influenced by social desirability, defined as answering items according to what is correct or socially acceptable (Maccoby & Maccoby, 1954). Another limitation was the sample's homogeneity because not all infertile people can afford to get infertility treatment. Due to the lack of prior studies on social anxiety, quality of life, and healthy lifestyle behaviors on women undergoing infertility treatment to compare with women who conceived after infertility treatment, there was not much supporting research on these topics.

Significance

The findings may add to the literature about social anxiety, quality of life, and healthy lifestyle behaviors on women undergoing infertility treatment compared with women who conceived after infertility treatment. This study addressed an underresearched area of infertility treatment's effect on women's social anxiety, quality of life, and healthy lifestyle behaviors in Turkey. This study may be a beginning point for other researchers to provide social and culturally based studies, research, training, and booklets on how to cope with social obstacles while having infertility problems.

Findings may be used to promote awareness among women, men, couples, adolescents, and mothers regarding factors influencing infertility. This increased awareness may lead researchers to provide culturally sensitive screening and psychoeducational interventions, programs, training, or booklets about social anxiety, quality of life, and healthy lifestyle behaviors for women undergoing infertility treatment. The findings may be beneficial for the field of women's health and reproductive programs. Findings may enhance knowledge of how to cope with infertility issues. Also, professionals' awareness and knowledge might increase to help women overcome infertility-related limitations and other issues. Finally, the findings of this study may provide a baseline for

future researchers regarding the social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment and women who conceived after infertility treatment.

Summary

Infertility is a significant issue that affects 10-20% of Turkish couples (Arıcı et al., 2006). Having infertility problems may impede people's attainment of life goals (Klock, 2011; Lee, Sun, & Chao, 2001). Although receiving infertility treatment may help women feel close to attaining their life goal, being under that treatment may cause psychological difficulties. The purpose of this study was to identify whether social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment were different compared to women who conceived after infertility treatment. Little was known about the impact of social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment compared to women who conceived after infertility treatment. In the Chapter 2, I present a literature review including search strategies and the theoretical foundation of this study. I review studies related to social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment compared to women who conceived after infertility treatment to demonstrate what was known and what remained to be studied.

Chapter 2: Literature Review

Infertility is a serious problem in Turkey as evidenced by 10-20 % of the population reportedly having infertility problems (Arıcı et al., 2006). Infertility is more than a natural and medical issue. Infertility has been shown to have complex interactions with social, environmental, psychological, emotional, sexual, economical, and relationship functioning (Kılıç et al., 2011; Kızılkaya Beji & Kaya, 2017). Infertile women may experience these complex interactions more than other groups such as their partners or women who became pregnant naturally.

In addition to medical and psychological factors, infertility might lead people to have cultural and social difficulties and problems. Every society has its own cultural norms, sexual myths, social norms, roles, and expectations regarding fertility (Ekmen, Özkan, & Gül, 2017). Not giving birth or becoming pregnant after marriage may lead to increased social restrictions such as not attending child birthday parties, social pressures such as close people asking about the reasons for not having children, and violence among couples because of not giving a baby to a husband. Infertile women in some cultures experience more social pressure and negative social consequences of infertility than men (Fledderjohann, 2011). Studies in Iran, Africa, Asia, Pakistan, Nigeria, Egypt, Kuwait, Turkey, and India showed that some women experience domestic violence due to infertility (Ameh et al., 2007; Ardabily, Moghadam, Salsali, Ramezanzadeh, & Nedjat, 2011; Dyer, Abrahams, Mokoena, Lombard, & van der Spuy, 2005; Fido & Zahid, 2004; Sami & Saeed, 2012; Hasanpoor-Azghdy, Simbar, & Vedadhir, 2015; Kızılkaya Beji & Kaya, 2017; Kuş, 2008; Yildizhan et al., 2009).

Another significant issue related to infertility is its effect on quality of life. Women's psychological well-being may be negatively impacted from the moment of diagnosis (Loftus & Andriot, 2012). Infertile women may have low quality of life, high emotional maladjustment symptoms, and relationship difficulties (Güleç, Hassa, Yalçın, & Yenilmez, 2011; Huppelschoten et al., 2013; Kızılkaya Beji & Kaya, 2017; Ramirez- Ucles, Del Castillo-Aparicio, & Moreno-Rosset, 2015; Yılmaz, & Oskay, 2017; Zeren, 2016). Quality of life troubles may have long-term effects

such as postpartum depression for women who become pregnant after infertility treatment (Akyüz, Seven, Devran, & Demiralp, 2010).

Women who have infertility may experience changes in their lifestyle behaviors. They may socially isolate themselves, make poor food choices, or live an overall unhealthy lifestyle (Kaya, Kızılkaya Beji, Aydın, & Hassa, 2016). Having healthy lifestyle behaviors is significant to protect people from illness or disorders and to increase their general health and well-being (Demir & Kızılkaya Beji, 2016). It is significant to have a healthy lifestyle and a healthy body during infertility treatment to become fertile (Demir & Kızılkaya Beji, 2016). The current study focused on Turkish women because those with infertility problems may face violence, threats of divorce, or their husbands marrying another woman while remaining married (see Öztürk, 2011; Topdemir Kocyigit, 2012). Due to the myriad of issues that can occur due to infertility, social anxiety, quality of life, and healthy lifestyle behaviors should be examined among this population of women.

The purpose of this study was to fill the gap in the literature regarding possible differences in social anxiety, quality of life, and healthy lifestyle behaviors among women undergoing infertility treatment and women who conceived after infertility treatment in Turkey. Findings may help women, couples, professionals, and society to understand the ways in which social anxiety, quality of life, and healthy lifestyle behaviors may benefit or harm women undergoing infertility treatment and women who conceived after infertility treatment. In this chapter, I present a comprehensive literature review related to key variables of the study's topic of social anxiety, quality of life, and healthy life style behaviors of women undergoing infertility treatment and women who conceived after infertility treatment. This chapter includes a brief introduction of the problem and a synopsis of current literature to justify the relevance of the problem and the purpose of this study. I include the literature search strategy, theoretical foundation, conceptual framework, and a summary of how the theories were used in similar studies. Finally, I summarize what is known and unknown in the discipline related to infertility and describe how this present study filled a gap in the literature.

Literature Search Strategy

The strategies used for this literature search included the following tools: YOK tez merkezi (Counsel of Higher Education Thesis Center), Türk Psikiyatri Dizini (Turkish Psychiatry Index), Klinik Psikiyatri Dergisi (Clinical Psychiatry Journal), Google Scholar, and online databases from Walden University and Okan University (PsycINFO, PsycARTICLES, JAMA, ProQuest Central, PSYCline, Academic Search Complete/Premier, and EBSCO). Searches were also conducted using electronic doctoral dissertations and theses at Walden University and global universities, American Psychological Association, and affiliated journals and psychology journals-Elsevier. Textbooks, encyclopedias, educational materials, conference presentations, and case reports in the area of infertility were all read and used in this review. The key search terms and combinations of search terms included *infertility*, *quality of life*, and *healthy lifestyle behaviors*, *social anxiety*, *infertility*, and *quality of life* or *life style behavior*. Additional terms searched were *infertility and quality of life*, *infertile women quality of life*, *infertility* and *emotions*, *infertility* and *physical health*, *infertility* and *social anxiety*, *infertility* and *cognition*, *infertility* and *behavior*, *infertility* and *life*, *infertility* and *relationships*, *infertility* and *stress management*, *infertility* and *pregnancy*, *infertility* and *pregnancy*, and *naturally*. Next, searches included statistics of *infertility*, *infertility treatment*, *infertility* and *culture*, *infertility* and *anxiety*, *infertility* and *social anxiety*, *social consequences of infertility*, *infertility* and *social phenomena*, *infertility process health promoting life style*, *social support and stress buffering theory*, *the health promotion model*, *health psychology theory*, and *psychological support for infertility in Turkey*. I searched the peer-reviewed literature in English and Turkish for studies published within the last 5 years, and the dates were later expanded from to 2010 to 2017 to find Turkish studies. There were few current studies found for the combined key words of infertility, quality of life, social anxiety, and healthy lifestyle in the Turkish population and Turkish language.

Theoretical Foundation

The social support and stress buffering theory (Cobb, 1976) addresses how supportive social relationships affect a person's coping with stressful events (Cohen & McKay, 1984). People's support needs can change, increase, or decrease with unexpected life events or crises. Supporting others is also beneficial for personal recovery from a traumatic event.

Several studies supported the social support and stress buffering theory. Cohen and Wills (1985) showed that people who have high social support from spouses, family members, or friends have better health than less-supported people. Having sufficient social support after traumatic life events might improve psychological well-being (Oginska-Bulik, 2015). DeLong (2012) showed that not having sufficient social support after traumatic experiences may result in post-traumatic stress disorder symptoms. It is difficult to share feelings about infertility problems because of the shame and grief (Huang, 2013; Jessup, 2005; Rosen, 2005). Also, being with people who have babies or children might cause negative effects on women experiencing infertility problems, such as detachment, self-isolation, and avoidance (Gise, 1997; Huang, 2013; Jessup, 2005; Rosen, 2005). This avoidance might cause women with infertility problems to have more shame, lower self-esteem, and diminished ability to cope with stressful life events (Berger, Paul, & Henshaw, 2013; Jahromi & Ramezanll, 2014; Pedro, 2015). The social support and stress buffering model' s assumption is that women who get infertility diagnosis can recover from psychological effects of infertility with a healthy social support system, especially the negative effected sense of self-worth, thinking ability, and coping skills. Martins and colleagues (2013) showed that the main moderator of having a high social support perceived by the person infertility problems is disclosing to the close relationships. To sum up, the results of this study will indicate about the way of women act (in terms of anxious and avoidance levels) in social environments after having infertility problems.

Conceptual Framework

The Pender's health promotion model (HPM) (2002) will be used as a conceptual framework of this study to understand the quality of life and healthy lifestyle behaviors of women

undergoing infertility treatment. The health can be defined as having goal directed behaviors of an individual about having a competent self-care with satisfied interpersonal relationships (Pender, 2000). Health promotion is defined as having motivation to reach directed goals about increasing well-being and actualize the potential of an individual (Pender, 2000). According to the health promotion model (Pender, Murdaugh, & Parsons, 2002), actions are results of the individual's characteristics and experiences and their effect subsequent actions which determines quality of life. In other words, health promoting behaviors occur as a result of experiences or individual characteristics. Individual characteristics include sociocultural, biological, and psychological influences. Sociocultural factors are race, ethnicity, acculturation, and socioeconomic status. Biological factors are body mass index, age, gender, marital status, and strength. Psychological factors are self-esteem, self-motivation, and definition of health (Harrison, 1997; Pender, 2000). The HPM uses an expectancy value theory and social cognitive theory rather than a fear or threat as a motivating factor to change a health behavior. The HPM presents a conceptual basis to address factors influence health promoting behaviors. Related to this study, this model will help me to understand the relationship between quality of life and healthy lifestyle behaviors of women undergoing infertility treatment compared with women who conceived after infertility treatment.

Taking into account Cobb's social support and stress-buffering model and Pender's health promotion model, the theoretical framework for this study will be based on the principle that women having infertility problems experience a significant life issue which may cause them to have high stress and need to have sufficient social support and healthy lifestyle behaviors in order to have a high quality of life. The stress of a wish and expectation of having a child may lead these women to experience disappointment, depression, anger, relationship problems, or self-worthlessness. A better understanding of psychological effect in infertility on women is necessary to understand and increase awareness about the effect of social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment to increase the conceivement of the treatment and total health well-being.

Literature Review

Historical Growth of Infertility

Throughout history, people have sought to find solutions to their own beliefs and moral systems in order to fulfill the desire to have children. Trobrian Islanders and Chukchi female shamans reported being able to create children by spirits and their sacred stones without having a sexual relationship (Mikulincer, Horesh, Levy-Shiff, Manovich, & Shalev, 1998). Australian Ingarda people thought the way about becoming pregnant was eating special foods or by embracing a sacred tree hung with umbilical cords from previous births (Mikulincer, et al., 1998). The Batak people believed that to become pregnant, women had to bury umbilical cords and placentas under their homes (Mikulincer et al., 1998). Ancient Hindus believed that women had to pass through a hole in trees or rocks to become pregnant (Beaurepaire, Jones, Thiering, Saunders, & Tennant, 1994). Women in some parts of Africa were eating the eye of a hyena with licorice and dill, while Siberian women had to eat spiders to become pregnant (Covington & Burns, 2006). In ancient Egypt, prescriptions related to early recognition of pregnancy and prevention from infertility were used. First treatments for infertility included witchcraft using pig teeth, elephant hair, frogs, spiders, making vows, amulet construction, and mythological beliefs (Neff, 1994; Öner, 2002).

In some cultures, men can hang their wives and Royal British men had the right to divorce their wives when they were faced with infertility issues (Bakacak, 2005; Öner, 2002). In old Indian/Native American traditions, a man had the right to burn his wife alive if she could not conceive a child (Bakacak, 2005; Öner, 2002). At the times of the Renaissance in England, doctors were recommending infertile women drink rabbit blood, urine, and filly (a young female horse) milk as a treatment (Bakacak, 2005; Öner, 2002). Also, there were other professionals who advised infertile women to go and enter healing waters (Bakacak, 2005; Öner, 2002).

Although infertility is a problem for both men and women, it has always been shown to be a problem more so for women than men (Bakacak, 2005; Keskin, 2014; Neff, 1994). For instance, Louis XVI of France had a penetration sperm problem but the public accused his wife of being

infertile and a lesbian (Öner, 2002). In order to hide infertility issues, men would still children from neighbors and claim them as their own (Covington & Burns, 2006). Historically infertility is a sensitive topic and people deal with infertility issues in a variety of ways. In order to assist individuals' infertility problems, the medical community began to look at the causes of infertility.

Medical Aspects of Infertility

Since the 1980s, infertility has been accepted as a serious reproductive health problem worldwide. According to the WHO (2010), there are 48.5 million couples having infertility problems (Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012). The World Health Organization (WHO, 2015) defined infertility as not getting pregnant after 2 years of regular sexual intercourse (at least two times per week) without contraception. There are two categorizations of infertility; primary infertility is when there is no previous pregnancy and secondary infertility when there has been at least one pregnancy (WHO, 2015).

Fecundity is the term used for the likelihood of getting pregnancy at the time of a menstrual cycle. In young healthy couples, the chance of a fecundity is 20-25% and decreases as the female age increases (Covington & Burns, 2006). Statistically, 25 % couples conceive in the first month of unprotected, 60 % within the 6 months, and 80%within the 12 months (Covington & Burns, 2006). Infertility occurs in 10-15% of couples in the reproductive age. However, in women at the end of their 30s, the rate of infertility reaches 25%, and after 40 years fertility decline is faster (Garcia, Nelson, & Wallach, 2006; Gordon & Speroff, 2003; Kadıoğlu, et al., 2004; Petrozza, & Styer, 2006; Sağlık Bakanlığı, 2000, 2005; Tekin, 2005; Yaralı & Esinler, 2004). Researchers have reported the rate of infertility in couples as between 10 and 20% in Turkey (Arıcı et al., 2006).

To increase fertilization and follow up of spontaneous pregnancy, there are several combinations of factors that have to occur. For women, the hypothalamus-hypophyseal-overian axis, fallopian tube functions, cervical and endometrial conditions has to be normal functioning. For men, the hypothalamus-hypophyseal-testicular axis, sperm production, and mobility of sperm should be normal functioning (Aksu & Demirtaş, 2004; Akyüz, 2004; Eichenauer, &Vanherpe,

1995; Garcia, Nelson, & Wallach, 2006; Gordon & Speroff, 2003; Kadıoğlu, et al., 2004; Sağlık Bakanlığı, 2000 &2005; Tekin, 2005; Yaralı & Esinler, 2004).

In addition to those listed above, for men to be fertile with perfect functioning he has to have at least one testicle to produce enough normal sperm to fertilize an ovum; at least one open side of the duct system (epididymis and vas deferens), be able to have an erection, be capable of ejaculation, and finally his sperm has to enter the uterus, get into the tubes and fertilize an oocyte (Speroff & Fritz, 2007). For women to become pregnant at least one ovary should have ovulation ability on a reliable level (4-6 weeks) (overfeed factor); the cervix must hold the sperm, feed it into the uterus and the tubal (cervical factor); the fallopian tube should be able to catch the egg that has been ovulated and effectively carry the sperm and the fertilized egg cell (tubal factor); the uterus should be suitable for embryo implantation, development and growth of the baby (uterine factor) (Aksu & Demirtaş, 2004; Akyüz, 2004; Eichenauer, &Vanherpe, 1995; Garcia, Nelson, & Wallach, 2006; Gordon & Speroff, 2003; Kadıoğlu, et al., 2004; Sağlık Bakanlığı, 2000, 2005; Tekin, 2005; Yaralı & Esinler, 2004). If there is a problem with those conditions or health status, couples have difficulty having children which is called infertility.

When seeking treatment for infertility, doctors take a detailed history from couples about complaints and the ways that they tried to get pregnant. Doctors ask for a complete medical, surgical, and gynecological history to determine diagnosis and treatment options (Ghadir et al., 2014; Kuş, 2008). Some of the questions are menstrual cycle regimen, amount of bleeding, duration, dysmenorrhea, dyspareunia, previous pregnancies, abortions, curettage, number of births, sexual intercourse frequency, sexual dysfunction, vaginismus, the duration of infertility, applied treatments, general health status, systemic diseases, thyroid diseases, medications used, diet, exercise, weight, body mass index, hirsutism, family history of early menopause and cancer, history of previous pelvic surgery, chemotherapy, pelvic radiotherapy, pelvic inflammatory disease (PID), story of a sexually transmitted disease, smear results, and smoking, alcohol, cocaine and drug addiction (Covington & Burns, 2006; Speroff & Fritz, 2007; Sağlık Bakanlığı, 2000 &2005).

Problems in menstrual cycle regimen, amenorrhea, rare menstruation, dysmenorrhea, and family history of early menopause suggests ovulation disorders (Speroff & Fritz, 2007). Past pelvic surgical operations (ruptured appendicitis, ectopic pregnancy myomectomy, adnexal surgery), pelvic inflammatory disease, and sexually transmitted disease history may suggest tubal factors (Speroff & Fritz, 2007). Pelvic or abdominal pain, menorrhagia, hysteroscopic surgery may suggest uterine pathologies (Speroff & Fritz, 2007).

About 20-25% of female infertility occurs as a result of ovulation disorders (Speroff & Frýtz, 2007). Anovulation is manifested by amenorrhea and menstrual irregularities (Speroff & Frýtz, 2007). One of the other most common endocrine disorder causality of infertility is the polycystic ovary syndrome (PCOS). The symptoms of PCOS are infertility, hirsutism, whole-body hair, oily skin, high cholesterol hypertension, nutritional disorders result in impaired glucose and insulin metabolism, obesity, polycystic over, akontozis nigrikans, and skin tags (Stein & Leventhal, 1935). PCOS can be caused by poor nutrition, weight gain. Even if women get pregnant, those with PCOS may miscarry because of endocrine disorder related with erroneous programming of brain hormones (Stein & Leventhal, 1935). The other common causalities of having infertility issues are found as reduced over-reserve and amenorrhea under 35 years of age. The reasons of having reduced over reserve and amenorrhea under 35 years old might be autoimmune diseases, receiving chemotherapy, and smoking (Stein & Leventhal, 1935).

About 30-40% of female infertility occurs as a result of tubal factors which means not showing normal functioning as a result of closed or damaged tubes to transport the egg and sperm (Speroff & Frits, 2007). The reasons of tubal factor are pelvic inflammatory disease, septic abortion, ruptured appendicitis, ectopic pregnancy, tubal surgery, endometriosis, previous operations, or tubal factor of surgical attachment of the tubes (Aksu & Demirtas, 2004; Speroff & Frits, 2007).

Uterine pathologies are rarely seen and detected in infertility. If uterine abnormalities could not be detected before pregnancy, women may have fibers, polyps, septum, intrauterine adhesions (synechiae), or miscarriage or follow infertilities. The diagnosis of infertility is made by

ultrasonography, hysteroscopy, hysteresesography, and laparoscopy (DeCherney et al., 2014; Ekin, 2005). Despite the cause, women who are diagnosed as infertile generally seek treatment.

History of Infertility Treatments

The development of infertility treatments was started with medical developments in the technological and human endocrinology areas. Aksu and Demirtaş (2004) stated that until the 1950s, infertility was formulated and treated as a psychological problem rather than a medical problem. Plato first stated that the problem of infertility may also be in men. In 1677, Dutch scientist Anton Leeuwenhoek examined the spermatozoa under a microscope (Covington & Burns, 2006). In 1765, Italian priest and physiologist Lazzaro Spallanzani discovered the embryo with dogs and defined it as a product of male seed, nurtured in the soil of the female (Covington & Burns, 2006).

The first fertilization experiments were started in the 1890s with rabbits (Covington & Burns, 2006). Since 1949, animal embryo transfer studies were carried out with the aim of increasing the genetic potential of animals (Covington & Burns, 2006). The first in vitro fertilization (IVF) was performed in rabbits after it was understood that the spermatozoa for fertilization must first pass through the female genital organs (Covington & Burns, 2006). In the late 1960s, Edwards and colleagues (1969) described the first IVF with human oocytes. The first IVF pregnancy was performed by Robert Edwards and Patrick Steptoe in 1978, and Cambridge de Louise Brown, came to the world healthy (Covington & Burns, 2006). Over time, various modifications of IVF therapy such as gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT), and intracytoplasmic sperm injection (ICSI) have emerged and are beginning to be used to treat infertility (Covington & Burns, 2006).

The GIFT is one of the infertility treatment techniques in which the preovulatory oocytes and washed sperm transferred directly to the fallopian tubes. GIFT is especially recommended when women has one fallopian tube (Asch, Balmaceda, Ellsworth, & Wong, 1986). The ZIFT is a technique that involves placing the zygote into the fallopian tube using laparoscopy. The ZIFT is

preferred mostly for male-factor infertility problems and for women whom GIFT did not work (Lin, Pan, Wu, Hung, & Chang, 2004). The intracytoplasmic sperm injection (ICSI) is another infertility treatment techniques in which the best single sperm is injected into the egg cell (Wisot & Meldrum, 2004).

In 1983, Trounson and colleagues first used the donor oocyte and frozen embryo to obtain pregnancy and childbirth. In 1984, the first GIFT baby and in 1986 the first ZIFT baby were born. The first ICSI pregnancy was performed in 1992. With ICSI pregnancy, a new period was begun in the field of assisted reproduction and a significant distance has been experienced in man-related infertility problems (Bakacak, 2005; Keskin, 2007; Neff, 1994; Öner, 2002). All these rapid developments have begun to solve infertility problems previously considered impossible. Although the medical aspect of infertility is being addressed, other aspects of infertility continues to be addressed.

History of psychosocial aspects of infertility. Researches on the psychosocial aspects of infertility began in the 1930s and have become known as a profession and mental health specialty in last 30 years focusing on treating infertile patients' neurosis in an attempt to cure their infertility (Covington & Burns, 2006). In the 1970s, mental health professionals started to help infertile people by providing psychological support, crisis intervention, and psychoeducation about coping ways on infertility related stress and increase quality of life during infertility process (Covington & Burns, 2006). Until today, mental health professionals have expanded to study in a wider area of infertility related issues including the infertility related stress, responses to infertility on women and men, cultural and social issues related with infertility by assessment, support, treatment, education, research, psychotherapy, couple therapy, sexual therapy, and consultation (Covington & Burns, 2006). Despite there being various psychosocial issues researched, there remain other areas that require further study. One such area is social anxiety as it relates to infertility.

Infertility and social anxiety. Childbearing is one of the essential parts of the adult life in most countries including Turkey. Infertility may cause infertile couples to not meet the socially

expected purpose of the marriage; having children. As a result, infertility issues may cause couples, especially women, some negative social consequences such as stigma and social isolation (Hasanpoor–Azghdy et al., 2015). For example, in Iranian culture, infertile women experience violence, marital problems, social and self-imposed isolation from certain people or events, social exclusion by family members, and social alienation (Hasanpoor–Azghdy et al., 2015). For those Iranian infertile women, coping strategies would be to ignore and avoid crowded ceremonies that includes children and pregnant women (Hasanpoor–Azghdy et al., 2015). Yılmaz and Oskay (2017) also showed that Turkish infertile women have also using similar strategies to Iranian infertile women as avoidance. In addition to avoidance, Turkish infertile women also use active-avoidance, active-confronting, and passive avoidance coping methods (Yılmaz & Oskay, 2017). Yılmaz and Oskay (2017) explained active avoidance as not being in the places where there are pregnant women or children. Active confronting can be explained as asking advice from people who are at the similar situation like having infertility issues. Passive avoidance is just trying to ignore everything about being childlessness (Yılmaz & Oskay, 2017). There is another study that showed Turkish infertile women has high ratio of feeling loneliness (Gokler, Unsal, & Arslantaş, 2014). The reasons of feeling that much loneliness can be explained by using those self-imposed isolation coping strategies found by Yılmaz and Oskay (2017).

Literature has several studies about the effect of infertility on individuals' anxiety levels. Açmaz et al., (2013) showed that women who have infertility problems because of PCOS have high depression, anxiety, social worry and low esteem. Also, the level of the psychiatric symptoms increases with weight gain and low self-esteem (Açmaz et al., 2013). Guz et al., (2009) conducted a study to investigate psychiatric symptoms of infertile women on depression, anxiety, and self-esteem. Results showed that infertile women have higher depression and anxiety than non-infertile women. There was also a positive correlational relationship between psychiatric symptoms and the level of receiving negative reactions from partners, partner's families, and social groups (Guz et al.,

2009). Indeed, in Kayseri, Turkey, infertile women have higher state and trait anxiety levels than naturally pregnant women (Albayrak & Günay, 2009).

Gulseren et al., (2006) investigated whether women having infertility problems have higher levels of anxiety than women who have no infertility problems and get their babies naturally, without any treatment. Also, Gulseren et al. (2006) stated that there was a decrease in the levels of anxiety and depression of women who conceived after infertility treatment. Karlıdere et al., (2008) conducted a study with a group of women undergoing infertility treatment and a group of women conceived after infertility treatment. Results showed that infertile group of women had higher anxiety and depression levels than the women who conceived after infertility treatment even they have similar social support levels.

To sum up, literature about social anxiety on women who have infertility problems showed that infertile women have increased levels of anxiety compared to women who conceived after infertility treatment and women who have no infertility problems. Although research on anxiety was found in the literature using the Turkish population as participants, no studies were found looking at social anxiety specifically with this population (women undergoing infertility treatment and women who conceived after infertility treatment). Thus, the variable of social anxiety related to infertility needs to be examined particularly since having a child is an expected social norm in Turkey. In addition to social anxiety, infertility can impact quality of life of women undergoing infertility treatment related with treatments, physical, mental, social well-being effects.

Infertility and quality of life. Clinical and biochemical evaluations do not reflect the personal affectedness from illnesses and there is an incompleteness in the science of health. Since WHO (1948) defined health as having an ideal well-being on physical, mental, and social areas, quality of life term has been started to gain importance. WHO (2005) defined physical health as the number of days spent in bed, the state of pain and physical well-being, and the perception of how much of daily work and work can be accomplished by spending energy. Social health is defined as the extent to which one can establish relationships with family members, neighbors, colleagues, and

other individuals in the community, and the perception of their integration, involves the development and maintenance of social relations (Guler, 2006). Mental health is defined as the emotional and mental states such as depression, anxiety, fear, anger, happiness, or things that may cause sudden illness such as falling in love or suffering from injustice (Guler, 2006).

With the treatment options, people live longer than before which bring to live with a more quality level rather than just breath and live without any quality in life. From this point of view, the quality of life can be described as living life with physical and mental well-being with the pleasure of happiness being in life (Kuş, 2008). After 1960s with the political debate in America, its usage became widespread, frequently used by economists and social scientists as a life status and lifestyle (Kuş, 2008).

Quality of life is the physical and psychological well-being of a person in sight. Many factors can contribute to the quality of life such as physical health, mental status, social relationships, interactions with the environment, enjoyment of life, level of independence and personal beliefs (Guler, 2006). The quality of life that is comprehends many different dimensions; it is a dynamic, multi-faceted, relative and subjective concept because it is in continuous development, showing differences according to persons.

Although there are several causalities of being infertile; those causalities have similar psychological effect on women. For example, Dilbaz, Cinar, Ozkaya, Vanli Tonyali, and Dilbaz (2012) showed that women under treatment with polycystic ovary syndrome and unexplained infertility have similar health quality. The PCOS phenotype 1 group have less health quality and higher depressive symptoms than other groups of infertile women which may relate with menstrual problems and hirsutism. Also, Romano, Ravid and colleagues (2012) looked at the possible personality and coping styles differences among women undergoing infertility treatment with explained infertility and unexplained infertility and found no significant difference on personality, coping styles, or depression and anxiety levels between women with explained and unexplained infertility. Therefore, following parts will be generalized to all types of infertility problems.

Literature showed that women have more negatively affected by infertility process than men (Atay, 2017; Gana & Jakubowska, 2014; Güleç et al., 2011; Kızılkaya Beji, & Kaya, 2017; Luk & Loke, 2015). Women have depressive and anxious feelings, sexual desire problems, negatively affected quality of life and emotional wellness, lower quality of life, and more emotional and dyadic adjustment problems than their husbands (Kızılkaya Beji, & Kaya, 2017; Huppelschoten et al., 2013; Zeren, 2016). I preferred to design my study with women, so the rest of the studies will focus on the quality of life on women during infertility treatment.

Being diagnosed with infertility and not having a baby naturally, may produce psychological disorders or symptoms in infertile women. Ashraf, Ali, and Azadeh (2014) investigated whether women having infertility problems have less quality of life than naturally pregnant women. Indeed, women who conceived after infertility treatment have lower quality of life than women who got naturally pregnant (Çavuşoğlu, 2015). Even a woman who conceived after infertility treatment or not, getting infertility diagnosis and undergoing its treatments may cause women to have low in mental health, quality of life, mobility, daily living activities, work capacity, sexual activity, religious beliefs, self-esteem and high depression and anxiety levels (Çavuşoğlu, 2015; Direkvand Moghadam, Delpisheh, & Direkvand Moghadam, 2014; Sezgin, Hocaoglu, Guvendag, & Guven, 2016; Xiaoli et al., 2016). Especially the lowest areas of quality of life are in emotional role limitation, mental health, vitality, general health, and social function (Kuş, 2008).

In addition to being infertile, working is another issue that can cause problems because when women go to work people may ask them about the reason they do not have children and that may cause pressure and anxiety on those women (Sezgin et al., 2016). Also, not sharing that having infertility issues is another thing that might increase the probability of feeling self-isolation and social avoidance for those women.

Social support is one of the components of the quality of life which might decrease the negative psychological effects of infertility. Social support can be in emotional, instrumental, informational, institutional support, or family and friends. Women who have higher support might

overcome the psychological impacts of the infertility process. Having a better self-esteem, acceptance of infertility, satisfaction with life, keeping hope, and lower anxiety and depression result with an increased life satisfaction, perceived social support, and quality of life (Dembinska, 2016). Otherwise, infertile women might also have obstacles in emotional role limitation, mental health, vitality, general health, and social function (Huppelschoten et al., 2013). Even the way of disclosing information about infertility has also impact on the perceived social support; because sharing indirect ways (incremental disclosure or through third parties) cause women to get less perceived quality support and lower quality of life than women shares with direct ways (Steuber, & High, 2015). Infertile women have intermediate level of perceived social support scores from family, friends, and special persons that the effective determinations are the age and the family shape (Kuş, 2008). With the decreased social support, hopelessness and depression level is increased in Turkish infertile women (Yurdagül & Oltuluoğlu, 2012; Erdem & Ejder-Apay, 2013). Therefore, to get a satisfactory level of social support, women has to disclose about the infertility issue, how it effects their lives, and expectations as in support from others.

Infertility and healthy lifestyle behaviors. Having a healthy life is one of the core rights of a human. Health is a wide term includes self-care, personal responsibility, optimum well-being, quality of life, and healthy behaviors (Akgün Kostak, Kurt, Süt, Akarsu, & Ergül, 2014; Aslantekin, 2011; Işık, 2010). A healthy society can occur only in healthy individuals. Being healthy and living healthy is individual's responsibility by controlling themselves and promoting their health. It is necessary for the individual to obtain positive behaviors that will protect, maintain and develop their own health conditions and help them to make the right decisions for their own health (Altıparmak ve Koca Kutlu, 2009; Aksoy ve Uçar, 2014; Beydağ ve ark., 2014; Hekim, 2015).

Although having baby is a dream of most of the marriage couples, they might have obstacles to reach this dream related with infertility problems. During infertility problems, women have to be aware and have healthy lifestyle behaviors, because of its effect to get pregnant, conceivement of the infertility treatment, and also for the health of the probable pregnancy and being healthy mother

and infant. The reason is that pregnancy is a process in which the risk of illness and death is higher than other periods of lifetime. Health and well-being behaviors of a woman before pregnancy may determine the health and fate of the baby (Coşkun, 2012; Dereli Yılmaz & Kızılkaya Beji, 2010). Healthy lifestyle behaviors are very important during the pre- and pregnancy periods to maximize the probability of a healthy and live birth and to reduce maternal-neonatal mortality and morbidity rate. Increased mortality rate of mothers and infants is associated with the risk of local or systemic health problems that make pregnancy risky for pregnant women or high-risk behavior or lifestyle in their pregnancies (Akdolun Balkaya et al., 2014; Onat & Aba, 2014). Undergoing infertility process provides a chance to learn, develop, or increase having healthy lifestyle behaviors. By this way, women can prevent and achieve the ideal level of fertility. To change or modify behaviors, there is a need to become aware of their impact with fertility.

Health behaviors contribute to being healthy and/or protect from illnesses that are labeled as healthy lifestyle behaviors. In order to develop or protect health, it is necessary to change unhealthy lifestyle behaviors and adopt healthy lifestyle behaviors (Demir & Arıöz, 2014; Saydam et al., 2007; Türkeri, 2006). Lifestyle behaviors can come from personal and social sources acquired by family, society, and education, change over time, are behaviors that enable one to maintain a good health condition, decide that it is right for him or her and realize it; adequate balanced nutrition, coping with stress, regular exercise, communicating, knowing hygienic precautions, having health consciousness, and responsibility. With having attitudes of healthy lifestyle behaviors, individuals transform to being well behaved, protected from illnesses, and improving health status into a better level (Akgün Kostak et al., 2014; Beydağ et al., 2014; Cihangiroğlu & Deveci 2011).

Health behaviors can be affected by psychological (knowledge, attitudes, beliefs, skills, and experiences), environmental (family, friends, and social sanctions), sociocultural factors (social norms related to attitudes and behaviors) and socioeconomic factors (Altay et al. 2015; Ulupınar Alıcı & Sarıkaya, 2009; Aslantekin, 2011; Vinikoor-Imler et al., 2011).

Being less likely to take environmental risks and avoiding health-threatening behaviors is referred to as 'health protection'. Health protection behaviors include primary prevention of disease; secondary prevention for early diagnosis and treatment; and tertiary prevention behaviors aimed at improving existing health status after treatment and improvement (Türkeri, 2006).

Health promotion is a combination of organizational, economic, and environmental support for education for any behavior and lifestyle directed towards health (Altay et al., 2015; Simsek, 2013). Increasing the sensitivity to health can increase the quality of life by providing control over one's own health, changing the lifestyles that can lead to illnesses, and eventually bring positive healthy lifestyle behaviors. So, as being adults, it is individual's responsibility to develop healthy behaviors and transform healthy lifestyle behaviors into everyday life habits (Altay et al., 2015; Cihangiroğlu & Deveci, 2011; Özyazıcıoğlu et al., 2011).

Lifestyle behaviors have a significant effect on psychological well-being and quality of life. Having healthy lifestyle behaviors have been shown to have a positive relationship with quality of life and negative relationship with depressive symptoms (Psaros, Kagan, Auba, Alert, & Park, 2012; Tol, Tavassoli, Shariferad, & Shojaeezadeh, 2013).

Smoking, body mass index of less than 18.5 kg/m2 or greater than 25 kg/m2, vigorous exercise or not having regular exercise, alcohol, nicotine and caffeine consumption, antidepressant medications, and stress all have negative effects on follicular development, ovulation, fertilization, and on infertility and assisted reproductive techniques (Kaya, Kızılkaya Beji, Aydın, & Hassa, 2016; Rooney & Domar, 2014). Also, types of nutrition, having an eating disorder, psychological stress, and being under exposure (environmental and occupational) have negative effects on fertility (Sharma, et al., 2013). For instance, consuming over 300 mg/day of caffeine can have a negative effect on infertility treatment (Demirci et al., 2016). Also, having an optimum level of regular physical activity has a positive effect on improvement on health status, the quality of life, health maintenance, and fertility (Mirghafourv, Sehhati, & Rahimi, 2014).

Components of Healthy Lifestyle Behaviors

Healthy lifestyle behaviors can be grouped under 6 parts which are nutrition, self-fulfillment, interpersonal relationships, stress management, physical activity, and health responsibilities (Akgün Kostak et al., 2014; Cihangiroğlu & Deveci 2011; Onat & Aba, 2014).

Nutrition. Nutrition can be defined as the use nutrients to protect, develop, and have a healthy life, and to keep living a happy life. The main aim of nutrition is to get the energy and nutrients needed by the individual according to their age, gender, physical activity and the physiological condition in sufficient amount (Bozhüyük et al., 2012; Simsekoglu & Mayda, 2016). Obesity is one of the most common problems overall in the 21th century. The main causality might be the "fast-food" habits and a reduction in physical activity. Obesity is an important life threating disease that can contribute to serious health problems such as infertility. There are several obesity-related reproductive problems including infertility problems, low fertility, and pregnancy complications (Amanak, Karaöz, & Sevil, 2014; Demir & Kızılkaya Beji, 2015).

Studies have shown that women who are obese during pregnancy have twice the risk of macrosomia, 2.5 times the risk of hypertensive diseases, four times the risk of gestational diabetes, one times the risk of premature birth, and two times risk ıf cesarean delivery than pregnant women of normal weight (Ata Kaptı, 2014; Callaway et al. 2006; Smith et al. 2008; Weiss et al. 2004). Therefore, obesity is closely related to components of the healthy life style behaviors. Risk factors for obesity are nutrition, physical activity level, and psychological factors (Uzun, 2014). Studies have shown that women who perceive themselves as overweight have more suicidal thoughts and attempts than normal weight women (Whetstone et al., 2007). Obesity before pregnancy is also another risk factor for maternal and neonatal mobility and mortality (Aydemir, 2014; Pasquali et al., 2003).

Women who plan to get pregnant are advised to make developments and changes about having a healthy daily lifestyle, habits, occupation, level of daily physical activity, solving personal and social problems, better economic situation or getting economic support, home design, probable

trigger diseases that she has before, probable side effect of using medications, having healthy leisure time activities, being away from unhealthy enjoyed foods and habits. Studies have shown that the rate of infant mortality is 10 times higher in undernourished countries and the rate of growth and mental development of undernourished children are lower than the children in other countries. Of the main causality to low birth delivery is the inadequate and unbalanced nutrition during pregnancy (Garipağaoğlu et al., 2007; Nogay, 2011).

Self-fulfillment. Self-fulfillment focuses on the development of the inner resources achieved by development, relationship building, and overcoming adversity. Development can be explained as taking one's own power to the maximum level for the purposes of life. Relationship building can be explained as feeling the sense of being in harmony with the universe. Overcoming can be explained as having inner peace and providing opportunities for new experiences (Aşçı, 2013; Bahar et al., 2008; Sezer, 2012;). In total, it is a personal awareness where the individual seeks the meaning and purpose of life in its spiritual development field. Spiritual development has dimensions with a person's physical, emotional, and social aspects. It is known that a person's questioning about health and illness behaviors have a positive effect on the spiritual development of the adaptation to changes, gaining the ability to overcome problems, power to become better again, and finding hope (Başal, 2006; Ölçer & Oskay, 2015; Wilkinson & Miller, 2007). Jesse and Reed (2004) reported that high spirituality is effective in smoking cessation during pregnancy. In another study with high-risk pregnancies, it has been shown that praying is often used as a method of coping (Giurqescu, Penckofer, Maurer, & Bryant, 2006). Benute et al. (2011) also point out that religious belief is a preventive factor in suicide attempts, religious belief provides social support for the woman, as well as ability to cope with life purpose, self-confidence, and crisis.

Interpersonal relationships. Interpersonal relationships have a great deal of effect on reaching a successful life. The most significant factors to have social health are person's relationships, being loved by others, feeling of belonging, working status, relationship with family members and co-friends, and having social hobbies (Bozhüyük et al., 2012; Wilkinson & Miller,

2007). In addition, individuals need to ask about health status, diagnosis, and treatment processes to the health team. Good communication skills are necessary to identify self, ask questions, understand, and explain things. Communication includes sharing thoughts and feelings through verbal and nonverbal messages (Bahar et al., 2008; Sezer, 2012; Tuğut & Bekar, 2008). Indeed, providing unconditioned support and safe attitudes powers individuals coping skills (Aslantekin, 2011; Türkol, 2012). Women's perspective about pregnancy occurs by their own personal knowledge and experiences, family members, close friends, and their relationship with health team members. In the process of getting pregnant and pregnancy, interpersonal relationships can be effective on both the mother and the baby. According to the Suarez, Cardarelli, and Hendricks (2003), not having sufficient emotional support during pregnancy increases the stress level and the risk of neural tube defect and congenital malformation. Even during the infertility treatment, if coping way of infertility is a problem focused strategies (seeking ways to solve the obstacle) rather than emotion-focused strategies (reflecting or sharing feelings, and distracting), women become pregnant more easily (Pottinger, Nelson, & McKenzie, 2014). Therefore, it is important to have supportive people encouraging women to have positive healthy behaviors who want to get pregnant and who are pregnant.

Stress management. Stress can be defined as the response to an event that impedes the fulfillment of the essential requirements arising from the interior and the exterior changes, and which threatens to disturb or distort the stability balance of the body (Amanak, Karaöz, & Sevil, 2014). Stress management is a psychological response to reduce or effectively control the tension using physiological and psychological resources (Amanak, Karaöz, & Sevil, 2014). Stress control and response are person specific and depend on a person's stress management skills. Responses to stress can be effective (ex. Anxiety, anger, sadness, and tension), cognitive (difficulty on concentration, memory problems, or indecision), behavioral (avoidance, aggression, alcohol-substance consumption, overeating), and physical responses (palpitations, increased blood pressure, chest pain, muscle tension, headaches) (Aşcı, 2013; Özmen & Önen, 2005).

The pituitary gland, which secretes reproductive hormones, is highly sensitive to sensory changes and stress. Any stress source may cause menstrual irregularities and an ovulatory cycle. Also, the stress of living in the modern life contributes to tiredness which has a negative effect on sexual desire and time for having sex (Amanak, Karaöz, & Sevil, 2014; Demir & Kızılkaya Beji, 2015).

In addition, attachment styles have an effect on pregnant mother's healthy behaviors with working pregnant mothers having a lower level of avoidance attachment style and high marital satisfaction compared with nonworking pregnant mothers (Yıldırımlı & Korkut, 2015). Another difference of attachment is that women who are pregnant after infertility treatment have higher maternal fetus and infant attachment than naturally pregnant women which may be another area for psychology professionals to prepare support groups about prenatal education (Chen, Chen, Sung, Kuo, & Wang, 2011). These difference of attachment styles from naturally pregnant women can be explained by having too much anxiety associated with experiences of reproductive loss and the presence of physical problems and concern about the safety and health of the fetus (Lin, Tsai, & Lai, 2013; Yakupova, Zakharova, & Abubakiroy, 2015).

Pregnancy is not only a natural life event but also may be a risk factor for having biological and psychological problems. Especially for women who are at risk of having or developing complications during the pregnancy process. Having high stress during pregnancy may lead to immune system suppression, decreased fetal birth weight, and increased risk of premature birth (Çalık & Aktaş, 2011). Maternal stress and socioeconomic factors in pregnancy negatively influence fetal development, leading to premature birth and increasing fetal malformation rate (Desdicioğlu & Malas, 2006). Chronic stress may be a threat for a person to cause permanent illnesses or changes. Using stress reduction techniques decreases the level of plasma cell free DNA level of women undergoing infertility treatment, which increases the probability of getting pregnant and successful infertility treatment (Czamanski-Cohen et al., 2014). Therefore, coping with stress is a precondition for protecting our spiritual, psychological, and physical health.

Physical activity. Physical activity is the sum of movements that help individuals to develop, protect, and keep healthy; to remain calm toward the stressful event; and to increase resistance to fatigue and illnesses. Corley-Newman (2017) showed that infertility treatment by itself does not have any impact of PTSD symptoms among women undergoing infertility treatment, whereas being infertile has a significant impact for the interaction of infertility treatment and psychological treatment with cause women to have physical health issues that might be related with stress levels.

In a large majority of society, physical activity and sports are perceived as synonymous things. However, physical activity is defined as activities that occur with energy expenditure using muscles and joints in daily life, increase heart and respiratory rate and result in fatigue at different aggressions. In this context, various activities such as exercise, play, and stair climbing during the day are accepted as physical activities besides sports activities (Hekim, 2015; Yalçın & Tekin, 2013).

A high level of physical activity increases people's health-related quality of life and reduces the likelihood of getting some diseases. Persons with sedentary lifestyles are two times more likely to have serious health problems. Doing regular physical activity may help people prevent obesity, slow down organic stress caused by lubrication and fattening, protect adults from various chronic diseases (ex. coronary vasculopathy, diabetes), and contribute to the formation and maintenance of healthy bone, muscle, and joint structure. Also, it helps individuals reduce anxiety and depression, increase feeling good, improve well-being, and increase the quality of life (Bozhüyük et al., 2012; Canan & Ataoğlu, 2010; Hekim, 2015).

Studies have also shown that doing exercise before and during pregnancy help women to protect posture, control of gaining weight, regulation of circulatory and digestive functions, increase strength and endurance of sleep quality, decrease back pain, and lower cesarean rates and birth complications (Api et al., 2005; Desdicioğlu & Malas, 2006; Taşcı Duran et al., 2013). In addition, doing exercise improves ovarian functioning and increases insulin sensitivity (Demir & Kızılkaya

Beji, 2015). Tinloy et al. (2014) found that pregnant women who engage in at least 150 minutes of a moderate level exercise per week decrease the cesarean rate and those who engage in 30 minutes of moderate level physical activity per day during the last 3 months of pregnancy have better cardiovascular problems than the less active women (Tinloy et al., 2014). It is also emphasized exercise before pregnancy may reduce the possibility of gestational diabetes mellitus that delays or reduces the need for insulin (Pata, 2011).

Health responsibility. Health responsibility is showing the protective and promoting behaviors toward own health. Also, health responsibility involves seeking professional help when necessary, getting informed about health, actively participating to the decisions about own health, and caring about self (Bozhüyük & et al., 2012; Sezer, 2012; Tuğut & Bekar, 2008). Feeling responsible is related with knowing one's body, being aware of any changes on own health, applying for health institutions, getting regular checkups, following health-related guidelines, and feeling responsible for one's own well-being (Türkol, 2012). Reading and learning about health issues has an impact on a better understanding of one's health status and determinants and improving self-efficacy in the acquisition of appropriate behaviors and experiences for the protection and development of health. Studies have shown that people who have high level of health reading and learning also have better health and self-esteem, motivation, problem-solving skills, health knowledge, lower health care costs, shorter hospitalization, and reduced frequency of health care use than others (Aslantekin, 2011; Baker, 2006; Simsek, 2013).

Responsibility for health before and during pregnancy includes taking and monitoring antenatal care, taking responsibility for health-related to pregnancy, taking care of self, and avoiding risky health practices. Healthy lifestyle behaviors before pregnancy include avoiding the use of cigarettes, alcohol, and drugs; using effective strategies for coping with stress, protecting oneself from sexually transmitted and other infectious diseases, getting adequate and balanced nutrition, keeping weight gain to the recommended level, getting regular physical activity, and

caring for oral hygiene (Aşçı, 2013; Lindgren 2005; Saydam et al. 2007). The health behaviors of women before pregnancy has a direct effect on the baby during pregnancy.

To sum up, literature showed that healthy life style behaviors have so much significant effect on mother and infants' well-being. Indeed, to have a conceived infertility treatment, healthy lifestyle is one of the core issues that women has to consider if they want to get pregnant. Women who want to get pregnant have to know and implement healthy lifestyle behaviors to maximize the likelihood of having a healthy baby both before and during pregnancy process.

Literature Relating to Similar Methodology

With the scope of the study, the other studies related to the constructs of interest are mostly conducted using quantitative methodology. A systematic review of studies between January 1980 and July 2009 showed that studies about life quality and healthy lifestyle behaviors were conducted with quantitative research design (Chachamovich et al., 2010). Additionally, Dilbaz et al., (2012) used a quantitative methodology for collecting the WHOQOL-BREF scale by a cross-sectional survey to determine the health quality profiles of infertile women. Direkvand Moghadam, Delpisheh, and Direkvand Moghadam (2014) used a cross-sectional study with using a quantitative methodology to compare the quality of life in fertile and infertile women. Huppelschoten et al. (2013) conducted a cross-sectional study with a quantitative methodology design to determine the quality of life and emotional status of infertile couples. Sezgin, Hocaoglu, Guvendag, and Guven (2016) used cross-sectional study with quantitative measurements to identify the difference of infertile and fertile women on the level of psychiatric symptoms, disability, and quality of life.

Gormack and colleagues (2015) conducted a cross-sectional study with using a self-reported behavior to identify the lifestyle choices and dietary aspects of women about to undergo infertility treatment in New Zealand. Psaros et al., (2012) used a quantitative methodology on cross-sectional review with the purpose of investigating depressive symptoms and health-promoting behaviors of 104 infertile women. Mirghafourv, Sehhati, and Rahimi (2014) used a cross-sectional analytical study with the multivariate linear regression to identify health-promoting lifestyle behaviors and

predictors for infertile people. Steuber and High (2015) used a cross-sectional study with convenient sample method of 30 infertile women to understand the effect of disclosure strategies, social support, and life quality after infertility diagnosis.

For investing, anxiety and social consequences of infertility, Yılmaz, and Oskan (2017) conducted a cross-sectional study with 412 married infertile couples completing the psychosocial infertility fertility problem stress scale, and coping strategy scale. Açmaz et al. (2013) used quantitative design to investigate the symptoms of depression, anxiety, low self-esteem, and social anxiety of 86 polycystic over syndrome Turkish women compared with 47 healthy women. Researchers wanted all participants to complete *Liebowitz' Social Anxiety Scale*, *Rosenberg' Self-Esteem Scale*, *SF- 36*, *Beck Anxiety Inventory*, and *Beck Depression Inventory*. Guz and colleagues (2009) conducted a study to determine psychiatric symptoms after getting infertility diagnosis of 50 primary infertility diagnosed Turkish women. With the control group of 50 non-infertile women, 100 participants completed the Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), Rosenberg self-esteem and Symptom Checklist scales. Another quantitative study was conducted by Kazandi et al., (2011) to investigate anxiety and depressive symptoms on Turkish infertile couples. 248 infertile women and 96 infertile men and for the control group, 51 women and 40 men who have kids already completed the BDI and STAI. Indeed, Albayrak and Günay (2009) conducted a quantitative research design to investigate the level of state and trait anxiety of 150 infertile women and 150 non-infertile women in Turkey with the state and trait anxiety inventory. To sum up, literature showed that psychological issues about infertility were studied by quantitative studies in most areas, but further studies needed with quantitative design about psychological effect on infertility on Turkish population.

Strengths and Weakness of Those Methodologies

The best way of evaluating infertility treatment process is using a quantitative research design with structured instruments. For validated scales in turkey, the best valid and reliable psychometric evaluations scale to identify the quality of life under infertility treatment process is

the Fertility Quality of Life (FertiQol) scale (Dural et al., 2016). According to the Huppelschoten et al. (2013) limitations of their study were low response rate to complete scales and using the scale only validated for Dutch women. Gormack et al. (2015) stated that their study's limitation was using a self-reported behavior with just collecting for one time through the treatment process. Limitation of the Dilbaz et al., (2012) study was limited number of subjects in each phenotype of polycystic ovary syndrome and the lack of evidence to explain the causality of the low physical score after getting ideal body mass index. This might be explained by not having scores related to a psychological well-being such as depression or anxiety that have an impact on perceiving the body.

Sezgin, Hocaoglu, and Guvendag Guven (2016) stated one of the limitations of their study was using a cross-sectional method because it caused problems to identify the causal relationship between infertility and the various psychological, functional, and quality of life measures assessed. The other limitations of their study were using self-rated measures, not making an evaluation of any psychiatric disorders, only married women from one urban outpatient department rather than generalized areas, not looking at sexual dysfunction as an effective area on quality of life and psychosocial effects of infertility, and limited sample size to use a multivariate linear regression analyses.

The limitations of Mirghafourv, Sehhati, and Rahimi's (2014) study were using a cross-sectional study because it does not show causality of the demographics and health-promoting lifestyle and using convenience sampling method because it blocks to generalize results. They recommend making further studies with using random sampling methods and including samples from different parts of the country. Another recommendation is to determine promoter and obstacles of health-promoting behaviors for infertile couples. Also, Steuber and High (2015) stated that the weakness of their study is choosing a cross-sectional design with the convenient sample because it blocked to look at the cause and effect. Kazandi et al., (2011) said that their study's weakness is using standard tests rather than specific measurements for infertility related problems. To further improve upon those studies, I will use a quantitative non experimental comparative study using

MANOVA. Also, I will use infertility specific scale (FertiQol), and include women of various socioeconomic status. Data will be collected from a fertility clinic in Istanbul, the city to which people from all parts of Turkey come for fertility treatment.

Rationale for Selection of Study Variables

I want to look for social consequences of infertility with social interaction and anxiety approaches because literature showed that psychological management is more effective when it includes cultural and social aspects (Gulseren et al., 2006; Kazandi et al., 2011). With the increased psychological well-being, the successful treatment ratios increase (Csemiczky, Landgren, & Collins, 2000).

Luk and Loke (2015) showed a systematic review of the studies related to infertile couple's psychological well-being, marital and sexual relationships, and quality of life. But there is not much attention on social consequences and sociocultural context of infertility in developing countries (Bos, van Balen, & Visser, 2005), which is necessary to take into account to understand the mental health and meaning of the behaviors of infertile women (Gulseren et al., 2006).

There are two ways to measure the social consequences of infertility. By using a qualitative design to capture cultural meanings and a quantitative design to assess and improve the need for psychological counseling (Gleil, Slauson-Blevins, & McQuillan, 2010). I prefer to use quantitative design with structured instruments to get exact issues to improve patients' well-being. No studies to date have specifically examined the social anxiety of infertile women in Turkey and only one study has looked at the social anxiety of polycystic ovary syndrome in women in comparison to naturally pregnant women (Açmaz et al., 2013). Also, systematic review studies showed that quality of life, healthy lifestyle behaviors and mental well-being has an interconnected relationship between each other (Chachamovich et al., 2010). Therefore, those three variables; quality of life, healthy life behaviors, and anxiety are all significant points to look at for Turkish infertile women.

Studies Related to This Study's Research Questions

There were some studies that related in part to the research questions of whether if there is a difference between the social anxiety, quality of life, and healthy lifestyle behaviors, of women undergoing infertility treatment compared with women who conceived after infertility treatment. For instance, Çavuşoğlu (2015) compared 100 pregnant women after infertility treatment and 90 naturally pregnant women based on SF-36 and Center for Epidemiologic Studies Depression Scale. It was hypothesized that there is a difference on the quality of life and depression levels among pregnant women after infertility treatment naturally pregnant women. Another hypothesis was determining the factors that impact on quality of life and depression level of naturally pregnant women and pregnant women after infertility treatment. The researcher found that women who conceived after infertility treatment had low mental health, physical function, and physical role than women who get naturally pregnant. Also, depressive symptoms were increased with the increased number of infertility treatment trial. The study proposed that the psychological effects of infertility might take longer even after the time of women conceived infertility treatment; hence, couples have to increase their awareness about the physical and emotional changes and experiences occurred at the diagnosis and treatment process in order to cope better with the psychological effects of infertility process.

Additionally, Demirci et al., (2016) compared healthy lifestyle behaviors of 101 infertile women and 120 women who have at least one child (fertile) based on the Healthy Lifestyle Behaviors Scale and the Perceived Stress Scale. It was hypothesized that there is a difference and a relationship between healthy lifestyle behaviors and perceived stress between infertile women and fertile women. The researchers found that although two groups were at the similar in optimum level of healthy lifestyle behaviors and perceived stress level; infertile women use more caffeine and experienced health responsibility and perceived stress more than fertile women. The study proposed that women have to be informed that unhealthy lifestyle behaviors may pose a risk of reproduction and help to change with healthy ones to not to affect recruitment.

Açmaz and colleagues (2013) compared symptoms of depression, anxiety, low self-esteem, and social anxiety of 86 infertile women (due to polycystic ovary syndrome (includes hirsutism, obesity, and oligomenorrhea) and 47 healthy fertile women. All participants completed scales of *Liebowitz' Social Anxiety Scale*, *Rosenberg' Self-Esteem Scale*, *SF-36*, *Quality of Life Scale*, *Beck AnxietyInventory*, and *Beck Depression Inventory*. It was hypothesized that some symptoms of depression, anxiety, low self-esteem, and social anxiety increase in infertile women. The researchers found that infertile women have the highest level of depression, but the highest level of anxiety and avoidance was in the hirsutism, oligomenorrhea, and obesity groups. The study proposed that there is a need for further studies investigate social anxiety of women having infertility issues addition to polycystic ovary syndrome.

Reviewing the infertility literature, it was found that psychological factors such as social anxiety, quality of life, and healthy lifestyle behaviors are areas that need further investigation in other populations. If these factors have been found as important to other cultures, then it is appropriate to investigate whether these issues impact other women such as those living in Turkey.

Summary and Conclusions

The current literature clearly shows that life quality and lifestyle factors play the significant role in the reproductive system. The other thing that literature showed is that infertile women may change socialization and coping strategies with the social environment after learning diagnosis. Training on how to promote healthy lifestyle showed its effectiveness to decrease risky lifestyle behaviors of infertile women (Kaya, Kızılkaya Beji, Ayın, & Hassa, 2016); whereas there is no clear evidence of the exact risky ones which negatively impact infertility process of infertile women (Demirci et al., 2016).

The emotional changes developed after infertility diagnosis and treatment may not be ended even with being pregnant after infertility treatment (Çavuşoğlu, 2015). Providing psychological support, including psychoeducation and stress reduction techniques, while undergoing infertility treatment increases the likelihood of getting pregnant and increases the success of infertility

treatment by decreasing level of natural killer cell activity (Hosaka, Matsubayashi, Suqiyama, Izuma, & Makino, 2002) and the level of plasma cell-free DNA level (Czamanski-Cohen et al., 2014). Some of the psychoeducation that can be provided include information about stress, its effect on the body, mind, feelings in short and long-term periods, especially its effect on infertility and immune system, the relationship between immune system and stress, and effective stress management and coping strategies. Stress reduction techniques may include supportive emotional approach, problem-solving techniques, relaxation training, breathing exercises, and guided imagery.

Although psychological support is so significant impact on psychological well-being and infertility treatment, I could not find any study about the structured psychoeducational program about social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment compared with women who conceived after infertility treatment. The current literature about Turkish women under infertility treatment and Turkish women who conceived after infertility treatment has found that being infertile and being under infertility treatment decreases life quality but participants were not compared with women who conceived after infertility treatment. Even those women conceived after infertility treatment, there might be still diversities and changed aspects towards social anxiety, quality of life, and healthy lifestyle behaviors compared to women undergoing infertility treatment. There is minimal research investigating specific aspects of social anxiety, quality of life, and healthy lifestyle behaviors of infertile women and women who conceived after infertility treatment. In Turkey, I could not find a study about the evaluation of the social anxiety, quality of life, and healthy lifestyle behaviors of women who get pregnant after infertility treatment. There is a gap in the literature in identifying specific outcomes of being infertile and factors related to social anxiety, quality of life, and healthy lifestyle behaviors of the women undergoing infertility treatment with a specific infertility related scale and compare and combine those scores with social anxiety and healthy lifestyle behaviors of the women who conceived after infertility treatment. Also, the findings of my study serve to increase knowledge in the discipline and heighten awareness among professionals to consider and help women to cope

with unhealthy social anxiety issues, increase quality of life, and healthy lifestyle behaviors. In Chapter 3, I will present the methodological structure in detail. Also, the research design, population, sampling and data collection procedures, instrumentation and operationalization of constructs, data analysis plan, threats to validity and ethical procedures will be discussed in detail.

Chapter 3: Research Method

The purpose of this quantitative comparative study was to determine whether social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment are different compared to women who conceived after infertility treatment. In this chapter, I present a description of the research design, the study variables, and research questions. Additionally, I discuss the population, sampling procedures, data collection procedures, instruments, operationalization of constructs, and data analysis plan. Finally, I describe ethical procedures and conclude with a summary.

Research Design and Rationale

A quantitative design is beneficial when a researcher wants to examine the relationship between at least two variables (Creswell, 2013; Sousa, Driessnack, & Mendes, 2007). In this study, I employed a quantitative approach with a comparative design to analyze data collected directly from participants. I identified the levels of social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment and those who conceived after infertility treatment. A comparative design is necessary when a researcher wants to search for similarity and variance of one or more variables (Creswell, 2013). Using a comparison research design allows researchers to understand differences between two groups (Mills, van de Bunt, & de Bruijn, 2006). Because I intended to examine whether there are any differences in social anxiety, quality of life, and healthy lifestyle behaviors between two groups (women undergoing infertility treatment and women who conceived after infertility treatment), this design was appropriate.

A survey is a common data collection method in infertility research. Studies on infertility have included surveys to collect data on variables such as emotional well-being, lifestyle behaviors, quality of life, coping skills, and relationships (Direkvand-Moghadam et al., 2014; Homan et al., 2007; Sezgin & Hocaoglu, 2014; Sharma, et al., 2013; Teskereci & Oncel, 2013; Ugur, 2014). A survey method to collect data about social anxiety, quality of life, and healthy lifestyle behaviors was appropriate.

Methodology

Population

The target population included women undergoing infertility treatment and women who had conceived after infertility treatment. The women had received infertility treatment at a private fertility clinic in Istanbul, Turkey. The criteria I used to select participants were being Turkish, being married, being at least 18 years old, having no previous biological children, diagnosed as infertile, and undergoing infertility treatment conceiving after infertility treatment. It was important to include women who had no children (secondary infertility) because having one baby might decrease infertility-related stress, which might increase quality of life scores (see Karabulut, Ozkan, & Oguz, 2013).

As stated on the recruitment flyer (see Appendix B), participants were expected to read and understand Turkish well enough to complete forms without assistance. Power analysis for a MANOVA with two levels of one independent variable and three dependent variables was conducted in G*Power to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, and a medium effect size ($f = 0.25$) (see Faul, Erdfelder, Buchner, & Lang, 2013). Based on these criteria, the minimum sample size was 44 per group or 88 total.

Sampling and Sampling Procedures

The sampling strategy was nonprobability with convenience sampling. The reason for using nonprobability convenience sampling was that the research was quantitative and participants were recruited in the fertility clinic. In convenience sampling, researchers use a sample with some inclusion criteria based on easy access to participants (Faul et al., 2009). In this study, I wish to secure data from women undergoing infertility treatment and women who had conceived after infertility treatment. Therefore, I selected participants from a private fertility clinic.

Because I intended to use a one-way MANOVA with one independent variable with two levels (women undergoing infertility treatment and women who conceived after infertility treatment) and three dependent variables (social anxiety, quality of life, and healthy life style

behaviors), power analysis was conducted in G*Power (Faul et al., 2009) to determine the minimum sample size. A small effect sample size of 20 was needed with alpha = .05, power = .80, and a large effect size (f = .40) (see Faul et al., 2013). A medium effect sample size of 44 was needed with alpha = .05, power = .80, and a large effect size (f = .25) (see Faul et al., 2013). A large effect sample size of 264 was needed with alpha = .05, power = .80, and a large effect size (f = .10) (see Faul et al., 2013). Based on these calculations, the minimum sample size was 88.

Procedures

Before starting to collect data, I obtained permission from the institutional review board (09-17-18-0404278) of Walden University. Then, I sent a recruitment letter to a private fertility clinic to request permission to recruit participants (see Appendix A). Also, I informed patients about the study and gave them the flyer including a brief description of the study including eligibility criteria (see Appendix B). I asked potential participants "Would you be willing to participate in a research study examining the social, quality, and lifestyle behaviors during and after infertility treatment?" If patients agreed to participate in the study, I gave them a packet containing the surveys and showed them where to deposit completed survey packets. The packet contained an informed consent form, demographic questionnaire, Leibowitz Social Anxiety Scale, Fertility Quality of Life Scale, Healthy Lifestyle Behaviors Scale-II, thank you letter, and a list of psychological support services.

All participants were asked to sign an informed consent, which included information about the right to decline or withdraw from the study at any time, voluntary participation, purpose of the research, and benefits and risks associated with participation. Once the participant acknowledged and signed the informed consent, they received the survey package and put it in the box or gave it to me by hand. The box was on the secretary's desk, which was easy to reach and safe. There was no way of checking with participants prior to the surveys being turned in; therefore, I assumed that participants signed the informed consent form and completed all surveys.

Completing the surveys took approximately 30 minutes. After completing the surveys, participants saw the last page of the package thanking them for participating in the study (see

Appendix I) and showing them a list of psychological support resources (see Appendix J). The page also contained my contact number and e-mail address if participants wanted to contact me with questions or to receive the study results. Participants were instructed to place completed surveys in the box next to the secretary's desk. To ensure participant confidentiality, the box was locked and had a slot big enough for the surveys. I possess the only key to open the box. Also, each survey package has a number rather than a name or any other personal information of participants. No personal information was gathered from participants.

Instrumentation and Operationalization of Constructs

Demographic questionnaire. The demographic questionnaire (see Appendix D) contains 18 items designed to collect information from women (undergoing infertility treatment and women who conceived after infertility treatment). The questionnaire will also contain questions about participants family structures, social life characteristics, and infertility treatment. The questionnaire will not contain specific identifying information such as the participant's name address or phone number. The demographic questionnaire will take approximately 5 minutes to complete.

Liebowitz Social Anxiety Scale. The Liebowitz Social Anxiety Scale (LSAS) (see Appendix E) was first developed by Liebowitz (1987) and is one of the most commonly used measures of anxiety (Forni dos Santos, Loureiro, Crippa, & Osoria, 2013; Soykan, Özgüven, & Gençöz, 2003). The main purpose of the scale is to identify social relationships and performance situations that fear and/or avoidance behaviors of people who have social anxiety problems. Alothugh this is a public domain measure, I get permission to use the scale, the letter is in the Appendix K.

The scale consists of 24 items with two subscales; 11 social relations and 13 performance items. The anxiety scores include the fear of being involved in social interactions or in situations where performance is required. The avoidance scores include the frequency of avoidance from these situations as a result of fear or anxiety that may be associated with social interaction or in situations that require performance.

Items use a 4-point Likert-type scale with scores ranging from 0 to 3. The LSAS takes approximately 10 minutes to complete. The scale takes into account the severity of fear and avoidance of the participant during the last week. The total score is obtained by gathering scores of fear and avoidance items. The total score is obtained with the lowest score being 0 and the highest score being 144 (Soykan et al., 2003). The increase in the score indicates that the level of social anxiety and the avoidance behavior are exacerbated.

The Turkish version of the scale was first created by Eren and Gümüş (1997) using Turkish university students as the sample. Then, in 2001, Dilbaz and Güz revised the measurements of the scale and found a Cronbach Alpha coefficient of its Turkish version as .96. The correlation coefficient between the evaluators was $r = 0.83$. The internal consistency of the scale is between .81 and .92.

In 2003, Soykan et al. redid the reliability and validity of the LSAS with the test-retest reliability coefficient were r=.97, for the scale in general and .95 and .98 for the subscales (Soykan et al., 2003). Cronbach Alpha score of social anxiety subscale was $r = .96$, and Cronbach Alpha Value of social avoidance subscale was $r = .95$. The validity study of the LSAS was found as strong in convergent validity and discriminant validity (Fresco et al., 2001).

The convergent validity of the scale was conducted with social interaction anxiety scale (0.47 to 0.76), social phobia scale (0.50 to 0.77), divergent validity of the scale was conducted with Hamilton Anxiety Scale (0.48), Beck Depression Inventory (0.39); and Hamilton Depression Rating Scale (0.52) and predictive validity was between 0.58 to 0.67 (Forni dos Santos, Loureiro, Crippa, & Osório, 2015). The convergent validity score were $r = 0.21$ to 0.84 in Brazilian Portuguese (Forni dos Santos, Loureiro, Crippa, Osório, 2013).

The cutoff points changes depending on the country. For example, U.S. use cutoff scores as 30 points (Mennin, Fresco, Heimberg, Schneier, Davies, & Liebowitz, 2002; Rytwinski, Fresco, Heimberg, Coles, Liebowitz &, Cissell, et al. 2009), Turkey use as more than 50 points (Soykan,

Özgüven, & Gençöz, 2003), Spanish use as between 19.6 to 26.1 (Bobes, Badía, Luque, García, González, &Dal-Ré, 1999).

Studies for factor analysis of the LSAC were shown that the items on all two dimensions of the scale were suitable for measuring anxiety and avoidance of outpatient with anxiety disorders, social phobia disorder, and nonclinical individuals (Baker, Heinrichs, Kim, & Hofmann, 2002; Beard, Weisberg, Perry, Keller, & Rodriguez, 2012; Oakman, Van Ameringen, Mancini, & Farvolden, 2003; Rytwinski, Fresco, Heimberg, Coles, Liebowitz, Cissell, & ... Hofmann, 2009; Safren, Heimberg, Horner, Juster, Schneier, & Liebowitz, 1999). No formal permission was needed to use the Liebowitz Social Anxiety Scale, because it was accessible to use by the public.

Fertility Quality of Life Questionnaire. The Fertility Quality of Life Questionnaire (FertiQol) scale is the first international validity measure to evaluate the quality of life in people who have infertility issues. The scale was developed by 27 professionals (researchers, psychologists, social workers, consultants, gynecologists, and nurses) from 11 countries (Boivin, Takefman, & Braverman, 2011). The Turkish version of the FertiQol scale was done by Ertuzun in 2008. In this study, the Turkish version of the FertiQoL questionnaire will be used as the measurement instrument for quality of life Turkish women undergoing infertility treatment and women who conceived after infertility treatment.

The scale consists of 36 items measuring core, treatment, physical health, and quality of life. The core module contains four subscales with 24 items. The emotional subscale has six items of negative emotions (e.g., jealousy, sadness, depression) which have an effect on quality of life. The mind-body subscale has six items to evaluate the effect of the physical health cognitive and behaviors of infertility. The relational subscale has six items to evaluate the effect of infertility on relationships. The social subscale has six items to indicate the extent to which social interactions are affected by fertility problems (Boivin et al., 2011a; Çetinbaş, Dağdeviren, Öztora, Çaylan, & Sezer, 2014).

The treatment module contains two subscales with 10 items. The treatment environment subscale has six items to measure the quality of the treatment and its accessibility. The treatment tolerance subscale has four items to evaluate the effect of the infertility treatment on the mental and physical size and daily life. There were two questions that measure physical health and quality of life (A. How do you evaluate your health? B. Are you pleased with your quality of life?). All items of the scale are scored on a 5-point Likert type scale. The total score is obtained with the lowest score being 0 and the highest score being 100. Higher scores on the scale mean a greater quality of life. The FertiQol scale will take approximately 10 minutes to complete.

The reliability of the FertiQol scale was determined by Boivin, Takefman, and Braverman (2011b). Boivin et al. (2011b) reported the total scale's Cronbach alpha value as .92, the core module was .92; treatment module was .80, emotional scale was .90, mind-body scale was .84, relational dimension was .80, social dimension was .75, and environmental dimension was .84. The treatment tolerance was calculated to be 0.72.

According to the Çetinbaş, Dağdeviren, Öztore, Çaylan, and Sezer (2014), when a measurement has good reliability coefficients, that study has also become a standardized measurement with good validity and reliability values without statistical measurement in validity (Çetinbaş, Dağdeviren, Öztora, Çaylan, Sezer, 2014). Validity is defined as the degree level of the scale including items to measures what it aims to measure (Mokkink et al., 2010). Dural, Yasa, Keyif, Celiksoy, Demiral, Ozgor, and Bastu (2016) conducted a study on the psychometrics of the Fertility Quality of Life scale and found that the scale has high validity for turkish version of the scale. The construct validity of the Fertility Quality of Life Scale was conducted with the HADS scale using Pearson's correlation coefficients at the modest correlation between 0.1 and 0.3 and a strong correlation between 0.5 and 0.8 (Petrie & Sabin, 2009).

Studies for factor analysis of the FertiQol scale were shown that the items on all six dimensions of the scale were suitable for measuring quality of life of women and men who have infertility issues. (Boivin, Takefman, & Braverman, 2011; Boivin et al., 2011b; Donarelli et al.,

2016). No formal permission was needed to use the FertiQol scale, because it was accessible to use by the public.

Healthy Lifestyle Behavior Scale II. The Healthy Lifestyle Behavior Scale (HLBS) was developed by Walker, Sechrist, and Pender (1987) with 48 items and six factors to examine health behaviors. In 1996, Walker and colleagues revised the scale and added four more items and labeled it as HLBS-II. HLBS-II has 52 items with six factors. The instrument was previously used with a wide range of participants and topics from students (Choi Hui, 2002; Carlson, 2000), workers (Bagwell, 1999; Beşer, Bahar, & Büyükkaya, 2007), mothers of adolescences (Black & Ford-Gilboe, 2004), elderly women (Craft & Grasser, 1998), chronic disease prevention programs (Grey, Berry, Davidson, Galasso, Gustafson, & Melkus, 2004), to chronic illnesses (Salyer, Sneed, & Corley, 2004). The HLSB-II takes approximately 10 minutes to complete.

It is scored using 4-point Likert type scale with 1 for “never”, 2 for “occasionally”, 3 for “frequent”, and 4 for “regular”. The total score is obtained with the lowest score being 52 and the highest score being 208. Higher scores mean that participant engages in more healthy lifestyle behaviors whereas lower scores means that participant has less healthy lifestyle behaviors.

The reliability for the total score of the Cronbach Alpha coefficient of its Turkish version was .92. The Cronbach alpha score for health responsibility subscale was .77, .79 for physical activity, .68 for nutrition, .79 for mental development, .80 for interpersonal relationships and .64 for stress management (Bahar, Beşer, Gördes, Ersin, & Kıssal, 2008).

The validity of the healthy lifestyle behavior scale-II was conducted by Esin (1999). The test-retest correlations were conducted and r value for total scale was 0.99; mental development was 0.99, health responsibility was 0.98, physical activity was 0.97, nutrition was 0.98, interpersonal relationships was 0.97, and stress management was 0.98 (Esin, 1999). The reliability coefficient scores were different in each item, changes from 0.27 to 0.55. Studies for factor analysis of the HLSB-II were shown that the items on all six dimensions of the scale were suitable for measuring investigation pf patterns and healthy life style behaviors of university students, nurses, and all adult

and old age individuals (Cao, Chen, Xu, Hua, Hua, & Li, 2012; Esin, 1999; Kirag, & Ocaktan, 2013; Walker, Sechrist, & Pender, 1987). For the validity of the Turkish version, one linguist and two faculty members translated the originally English version scale of HLBS-II in to Turkish language (Bahar, Beşer, Gördes, Ersin, & Kıssal, 2008). For the construct validity, researchers used factor analysis, Kendall W analysis and all professionals had similar statistical points (Kendall W: 0.188, p: 0.246). In short, both Esin (1999) and Bahar, Beşer, Gördes, Ersin, and Kıssal (2008) found that the Healthy Lifestyle Behaviors Scale-II was high and enough to use in internal consistency and construct validity. No formal permission was needed to use the Health Lifestyle Behaviors Scale-II, because it was accessible to use by the public.

Data Analysis Plan

All of the data analysis will be conducted through SPSS program (version 25). For this quantitative comparative research design, I will use a one way MANOVA to examine the functional relationship between of social anxiety, quality of life, and healthy lifestyle behaviors in women undergoing infertility treatment as compared to women who conceived after infertility treatment. Hence, there is one independent variable with two levels and three dependent variables. The independent variable is infertility treatment with two levels are women undergoing infertility treatment and women who conceived after infertility treatment. Dependent variables are social anxiety, quality of life, and healthy lifestyle behaviors.

A MANOVA is appropriate to analyze data because there is one independent variable with two levels which are categorical data (undergoing infertility treatment and conceived after infertility treatment) with three dependent variables which are continuous data (social anxiety, quality of life, and healthy lifestyle behaviors). The MANOVA tests both null hypothesis (H_0) and the alternative hypothesis (H_a) with providing information whether differences exist between social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment compared to women conceived after infertility treatment. Also, using MANOVA will allow me to consider

inter-correlations among dependent variables, social anxiety, quality of life, and healthy lifestyle behaviors (Cohen, Cohen, West, & Aiken, 2003; Jaccard & Jacoby, 2010).

The following are the research questions that will be used for this study.

Research Question 1: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score?

H_o1: Women undergoing infertility treatment will not have higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score.

H_a1: Women undergoing infertility treatment will have a higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score.

Research Question 2: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score?

H_o2: Women undergoing infertility treatment will not have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score.

H_a2: Women undergoing infertility treatment will have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score.

Research Question 3: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score?

H_o3: Women undergoing infertility treatment will not have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score.

H_a3: Women undergoing infertility treatment will have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score.

Threats to Validity

All studies have to examine the internal and external validity threats because all study types may have some risks that researchers have to be aware and try to minimize. There are three types of validity threats considered for this study. These groups are external validity, internal validity, and construct or statistical conclusion validity.

Threats to external validity include any risks that can limit the study's results to other groups (Creswell, 2013). I will use a comparative research design which is the best method to analyze similarities and differences between at least two different groups to have new understanding and insight about those groups (Creswell, 2013). Threats of using a comparative research design is that researcher has to have adequate sample size and using accurate measurement tools. In this study, I will use the sample size according to the statistical power necessity and use scales which are specifically designed to the variables. There might be an external threat of the Hawthorne effect in which participants might answer the items according to the reaction to the arrangement. In order to overcome this threat, I may write a note in the informed consent to giving the accurate answers is the best for research purpose.

The internal validity of a study means at which level the design of the study can give a causal inference (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008). Threats to internal validity include any risks that can limit the study's results to show the correct relationship between the independent and dependent variables (Creswell, 2013). In this study, I will use a comparative design which is a direct threat to internal validity to give a cause-effect relationship between

variables. Although this study might have good comparison results, that does not mean that the independent variables directly impact the dependent variables. There might be some instrumentation threat with the Leibowitz Social Anxiety Scale and FertiQol scale because the researchers did not show any statistical measurements for validity of those scales (Onwuegbuzie, 2000). Using a quantitative method will also help me to release from any subjectivity or experimenter bias that might occur (Hara, 1995).

Another internal validity threat might be the length of time to complete the surveys. Participants might not complete surveys in their entirety or respond untruthfully. I will use a quantitative comparative research design with surveys which have high-reliability scores. With high reliability of measures, this study results will overcome threats to statistical conclusion validity (Trochim, 2006). Also using close ended Likert type questionnaires, allow participants to select a choice rather than writing their own thoughts in sentences that can be judged by researcher or cause them to feel anxious about what and how to write it. So, preferring Likert type surveys will overcome the social construct threat of this study (Trochim, 2006). On the other hand, I will use a non-probability sampling with convenience sampling which might be an external threat with the populations' homogeneity. In order to overcome the threat to homogeneity, I will collect data from different days, population, socioeconomic and cultural status rather than just one homogenous group.

Ethical Procedures

This study is designed to uphold guidelines and ethical standards of the American Psychological Association's Code of Ethics (Standard 8; 2010). According to these guidelines, my first values and purposes are being a beneficiary, responsible, integrity, and respect for others. As such, this study will be constructed in such a way not be harmful, or minimize any risks of harm, to protect the privacy and confidentiality of the participants, and be clear and share about the goals of the research, its purposes, and expectations from participants. Prior to conducting this study, I will gain permission from the Institutional Review Board (IRB) at Walden University. I will gain

permission from the fertility clinic's ethical community to collect data. After getting permissions, I will prepare the assessment package including informed consent, demographic form, Social Anxiety cale, Fertility of Quality of Life Scale, Healthy Lifestyle Behaviors Scale, thank you letter, and a list of psychological support resources for whom they need.

Before participating in the study, participants will read and sign the informed consent. The informed consent will include information about the right to decline or withdraw from the study at any time, voluntary participation, the purpose of the research, benefits associated with participation of getting the results, and confidentiality of personal information. The informed consent will also include that they can decide at any time to discontinue participating in the research which will have no effect on their medical treatment. The participants will be given a contact number and email address in case they have questions about the research or its findings.

Data gained from participants will only be used for the study. To protect privacy, surveys will be anonymous and participant names and contact information will not be collected on the surveys. Packets will have a number that will help me to code data. All collected forms and data will be in a locked cabinet in which the only access will occur by me and will kept for 7 years.

Summary

In this chapter, I presented the research design, methodology, and threats to the validity of the study. The first part of the research design includes the study variables and research questions with the use of a quantitative comparative design to evaluate data collected from participants. Specifically, the rationale for the use of a comparative design was discussed. A comparative design will facilitate testing the hypotheses of whether or not women undergoing infertility treatment and women who conceived after infertility treatment differ or not in the social anxiety, quality of life, and healthy lifestyle behaviors.

The methodology includes the population, sampling strategy (convenience sampling), with its procedures, data collection, instruments, and the data analysis plan was presented. Threats to validity, includes any potential threats to external, internal construct, and statistical conclusion

validity including the ways how those threats was addressed. Finally, ethical procedures and considerations were explained in detail about the way of accessing participants, approach to human participants, and data protection. In the next chapter, I will discuss the data collection with analysis, the findings of the study, a summary of the answers to the research questions with a transition to Chapter 5.

Chapter 4: Results

The purpose of this quantitative study was to determine whether social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment are different compared to women who conceived after infertility treatment. The surveys used in this quantitative study were designed to measure social anxiety, quality of life, and healthy lifestyle behaviors of the infertile women and women who conceived after infertility treatment. Three hypotheses were tested using a variety of statistical techniques. The data were not in a normal distribution format or a bell curve, so Mann-Whitney U tests were used to analyze the data. The independent variables had two levels: women undergoing infertility treatment and women who conceived after infertility treatment. There were three dependent variables: social anxiety, quality of life, and healthy lifestyle behaviors. All statistical analyses were performed using SPSS Version 25. In Chapter 4, I describe the methods used to analyze the data and results of the analyses. The summary of results is reported in the final section of this chapter, including the frequencies for all categorical variables and results of the Mann-Whitney U test.

Data Analysis

Data were analyzed using SPSS Version 25. The statistical significance level was determined as $\alpha = 0.05$. The first part of data analysis was the frequency distribution of the demographic questionnaire. First, the percent of responses and the average response for each of the three scales as well as the reliability coefficients were calculated. Next, group difference tests were conducted to test hypotheses. To determine which analysis would be appropriate for the determination of group differences, tests were carried out to ensure normal distribution. Kolmogorov-Smirnov and Shapiro-Wilk normal distribution test were applied to all subscales and total scores obtained from the scales. Results showed that the normal distribution was not attained. Therefore, nonparametric methods were used to test hypotheses instead of parametric methods. Instead of the parametric two-way MANOVA, I had to use a nonparametric Mann-Whitney U test, which was performed for two groups (women undergoing infertility treatment-UIT and women

conceived after infertility treatment-CAIT). Mean rank values were used to assess the main group causes differentiation.

Reliability Analysis

The most common measures to assess the reliability of a scale are Cronbach's alpha, split, parallel, and absolute parallel (strict) Alpha. If the Cronbach's alpha results are over 70%, that means the questionnaire has adequate reliability. Some researchers expect this value to be over 75%. Scores higher than 70% show that the questionnaire has internal consistency and inferences can be trusted. In this study, the percentage values of the four tests met the criterion of trust as shown in Table 1.

Table 1

Reliability Analysis Results of the Questionnaires

Criteria	Reliability resulsts of the questionaire
Cronbach's_alpha	0.904
Split	0.902-0.905
Parallel	0.903
Strict	0.904

Decision of Sample and Power Analysis

Power analysis was conducted with G * POWER 3.1 to determine the number of survey participants for group difference tests and their ability to produce robust results. Cohen (1984) and Parajapati et al. (2010) stated that $1-\beta = 0.95$ is enough for statistical power to calculate group differences. Statistical significance was taken as $\alpha = 0.05$. The results of the power analysis for group differential analysis showed that for a reliable result there had to be a minimum of 176 participants in this study. Therefore, I collected data from 200 participants to have a reliable analysis and results. The G*Power was conducted to determine a sufficient sample size using an alpha of 0.05, a power of 0.95, and a medium effect size ($f = 0.5$). Based on these assumptions, the minimum sample size was 88 per group or 176 total.

Data Collection

Data were collected from October 21, 2018, through January 4, 2019, during which time 240 women completed the survey package. Of the 240 surveyed women, 228 were considered eligible to participate after indicating that they were Turkish, married, at least 18 years old, no previous biological children, diagnosed as infertile, and undergoing infertility treatment or conceiving after infertility treatment. Of these, 15 were eliminated from analysis due to missing data (n = 4) or elimination questions (e.g., having a crisis event other than infertility, n = 11), leaving a final valid sample of 100 for each group, 200 in total. Participants for the study were invited through a flyer on the tables in the waiting room of the infertility treatment clinic. I asked potential participants whether they were interested in participating in the study. I gave the survey package to the interested participants and showed them the locked box to submit the completed package. The survey package included the informed consent form, demographic questionnaire, Leibowitz Social Anxiety Scale, Fertility Quality of Life Scale, Healthy Lifestyle Behaviors Scale-II, thank you letter, and a list of psychological support services.

Women Undergoing Infertility Treatment

Demographic Information

Each participant completed a self-report demographic questionnaire. Most of the participants undergoing infertility treatment were 26-35 years old (53%), married between 0 and 5 years (58%), at least a bachelor's degree (65%), living with nuclear family members (87%), active working (53%), middle income (62%), actualizing necessity duties of religion (43%), not having any additional emotional crisis in last 6 months out of infertility issues (100%), not having any pregnancy process before (36%), no children (71%) with no miscarriage (59%). Tables 2a, 2b, and 2c present these demographic data.

Table 2a

Frequency Distribution for Age, Years of Marital Status, Members Living Together, and Attending Religious Duties of Women Undergoing Infertility Treatment

Variable	*N*	%
Age		
18-25 years old	6	6.0
26-35 years old	53	53.0
36-45 years old	41	41.0
Years of Marital Status		
0-5 Years	58	58.0
5-8 Years	22	22.0
8^{+} Years	20	20.0
Members Living Together		
Nuclear Family	87	87.0
Husband's Family Members	6	6.0
My Family Members	7	7.0
Attending Religious Duties		
None	20	20.0
Little	34	34.0
Just do Necessities	43	43.0
Too much	2	2.0

Table 2b

Frequency Distribution for education, income status, and working status of Women Undergoing Infertility Treatment

Variable	*N*	%
Education		
Literate	5	5.0
Elementary School	11	11.0
High School	19	19.0
University/Master Degree+	65	65.0
Income Status		
Low (income is lower than outcome)	8	8.0
Middle (income is equal to outcome)	62	62.0
High (Income is higher than outcome)	30	30.0
Working Status		
Not Working	45	45.0
Never Worked	2	2.0
Working	53	53.0

Table 2c

Frequency Distribution for Pregnancy Numbers, Birth Numbers, and Pregnancy Loss of Women Undergoing Infertility Treatment

Variable	***N***	**%**
Pregnancy Number		
0	36	36.0
1	31	31.0
2	16	16.0
3^{+}	17	17.0
Birth Number		
0	71	71.0
1	26	26.0
2^{+}	3	3.0
Pregnancy Loss Before		
Yes	41	41.0
No	59	59.0

In addition to those data, women undergoing infertility treatment who had miscarriage before answered that they mostly had one miscarriage (74.3%) without any specific reason (94.3%), most of them has no physical-chronic illness (76%), but whom has chronic illness answered with thyroid mostly (62.5%). Table 2d present these demographic data.

Table 2d

Frequency Distribution of Number of Miscarriage, Reason of Miscarriage, Physical Chronic Illness Status, & Type of Physical-Chronic Illness of Women Undergoing Infertility Treatment

Variable	N	%
Number of Miscarriage		
1.00	26	74.3
2.00	4	11.4
3.00	2	5.7
4.00	3	8.6
Total	35	100.0
Reason of Miscarriage		
Without Reason	33	94.3
Others	2	5.7
Total	35	100.0
Physical-Chronic Illness Status		
No	76	76.0
Yes	24	24.0
Type of Physical-Chronic Illness		
Thyroid	15	62.5
Blood Pressure	2	8.3
Others	7	29.2
Total	24	100.0

Most of the women undergoing infertility treatment evaluate social support system as sufficient (61%), want to have a child between 1-2 years (33%), having infertility treatment less than 1 year (49%) with the infertility reason of female factors (34%). Table 2e present these demographic data.

Table 2e

Frequency Distribution of Social Support Evaluation, Duration of Wanting To have a Child, Duration of Infertility Treatment, Reason of Infertility, & Duration of Conceived Infertility Treatment of Women Undergoing Infertility Treatment

Variable	N	%
Social Support Evaluation		
Insufficient	39	39.0
Sufficient	61	61.0
Total	100	100.0
Duration of Wanting To have a Child		
Less than 1 year	13	13.0
1-2 years	33	33.0
3-5 years	30	30.0
6-10 years	16	16.0
11^{+} years	8	8.0
Total	100	100.0
Duration of Infertility Treatment		
Less than 1 year	49	49.0
1-2 years	17	17.0
3-5 years	18	18.0
6-10 years	11	11.0
11^{+} years	5	5.0
Total	100	100.0
Reason of Infertility		
Female Factors	34	34.0
Male Factors	23	23.0
Female and Male Factors	16	16.0
Unexplained Factors	27	27.0
Total	100	100.0

Scale Evaluations of the Women Undergoing Infertility Treatment

Leibowitz Social Anxiety Scale. The answers of the women undergoing infertility treatment for all of the three scales will be distributed in this part. The first scale was the Leibowitz Social Anxiety Scale. the Anxiety subscale of the Leibowitz Social Anxiety answers have 4 level of scoring, “0” means no fear or anxiety, “1” means mild level fear or anxiety, “2” means moderate level of fear or anxiety, and “3” means severe level of fear or anxiety. As seen from the Table 7 with statistical information including mean and standard deviation; most of the women undergoing infertility treatment answered 24 questions of the anxiety subscale of the Liebowitz Social Anxiety Scale around “2” scoring which means most of the women undergoing infertility treatment have moderate level of fear or anxiety (M=1.99).

Table 3a

Anxiety Subscales of the Social Anxiety Scale for Women Undergoing Infertility Treatment

	None or Too Mild	Mild	Moderate	Severe	*M* ± *SD*	
1. Speaking up at a meeting	18.0	38.0	28.0	16.0	2.4200	± .96588
2. Acting, performing or giving a talk in front of an audience	11.0	39.0	29.0	21.0	2.6000	± .94281
3. Being the center of attention	21.0	31.0	38.0	10.0	2.3700	± .92829
4. Trying to pick up someone	35.0	17.0	29.0	19.0	2.3200	± 1.14486
5. Giving a report to a group	41.0	30.0	20.0	9.0	1.9700	± .98939
6. Entering a room when others are already seated	41.0	33.0	24.0	2.0	1.8700	± .84871
7. Talking to people in authority	41.0	30.0	22.0	7.0	1.9500	± .95743
8. Returning goods to a store	53.0	24.0	18.0	5.0	1.7500	± .92524
9. Expressing a disagreement or disapproval to people you don't know very well	42.0	32.0	22.0	4.0	1.8800	± .89081
10. Working while being observed	28.0	39.0	22.0	11.0	2.1600	± .96106
11. Talking with people you don't know very well	55.0	21.0	16.0	8.0	1.7700	± .99346
12. Going to a party	57.0	24.0	12.0	7.0	1.6900	± .93954
13. Looking at people you don't know very well in the eyes	43.0	30.0	18.0	9.0	1.9300	± .98734
14. Taking a test	19.0	45.0	28.0	8.0	2.2500	± .85723
15. Writing while being observed	42.0	27.0	22.0	9.0	1.9800	± 1.00484
16. Calling someone you don't know very well	51.0	27.0	14.0	8.0	1.7900	± .96708
17. Eating in public places	58.0	15.0	13.0	14.0	1.8300	± 1.11966
18. Giving a party	53.0	20.0	13.0	14.0	1.8800	± 1.10353
19. Participating in small groups	47.0	30.0	17.0	6.0	1.8200	± .92529
20. Drinking with others in public places	66.0	16.0	10.0	8.0	1.6000	± .96400
21. Telephoning in public	57.0	20.0	14.0	9.0	1.7500	± 1.00880
22. Meeting strangers	55.0	26.0	9.0	10.0	1.7400	± .99107
23. Resisting a high pressure salesperson	39.0	36.0	10.0	15.0	2.0100	± 1.04924
24. Urinating in a public bathroom	28.0	24.0	24.0	24.0	2.4400	± 1.13991
Total					1.9904	±

Table 3b

Avoidance Subscale of the Leibowitz Social Anxiety Scale for Women Undergoing Infertility Treatment

	None or Too Mild	Mild	Moderate	Severe	*M* ± *SD*	
1. Speaking up at a meeting	23.0	34.0	29.0	14.0	2.3400	± .98699
2. Acting, performing or giving a talk in front of an audience	25.0	38.0	26.0	11.0	2.2300	± .95193
3. Being the center of attention	28.0	36.0	28.0	8.0	2.1600	± .92899

4. Trying to pick up someone	14.0	33.0	27.0	26.0	2.6500	±	1.01876
5. Giving a report to a group	43.0	33.0	16.0	8.0	1.8900	±	.95235
6. Entering a room when others are already seated	41.0	29.0	20.0	10.0	1.9900	±	1.01000
7. Talking to people in authority	53.0	22.0	17.0	8.0	1.8000	±	.99494
8. Returning goods to a store	59.0	22.0	13.0	6.0	1.6600	±	.92354
9. Expressing a disagreement or disapproval to people you don't know very well	41.0	33.0	19.0	7.0	1.9200	±	.93937
10. Working while being observed	36.0	37.0	16.0	11.0	2.0200	±	.98453
11. Talking with people you don't know very well	55.0	26.0	12.0	7.0	1.7100	±	.93523
12. Going to a party	55.0	29.0	5.0	11.0	1.7200	±	.98555
13. Looking at people you don't know very well in the eyes	44.0	37.0	11.0	8.0	1.8300	±	.92174
14. Taking a test	32.0	47.0	14.0	7.0	1.9600	±	.86363
15. Writing while being observed	46.0	31.0	13.0	10.0	1.8700	±	.99143
16. Calling someone you don't know very well	57.0	30.0	9.0	4.0	1.6000	±	.81650
17. Eating in public places	60.0	16.0	13.0	11.0	1.7500	±	1.05768
18. Giving a party	59.0	21.0	13.0	7.0	1.6800	±	.95219
19. Participating in small groups	58.0	24.0	13.0	5.0	1.6500	±	.89188
20. Drinking with others in public places	60.0	22.0	7.0	11.0	1.6900	±	1.01200
21. Telephoning in public	54.0	21.0	12.0	13.0	1.8400	±	1.07984
22. Meeting strangers	48.0	31.0	12.0	9.0	1.8200	±	.96797
23. Resisting a high pressure salesperson	35.0	41.0	10.0	14.0	2.0300	±	1.00960
24. Urinating in a public bathroom	26.0	25.0	23.0	26.0	2.4900	±	1.14146
Total					1.9292	±	

The Avoidance subscale of the Leibowitz Social Anxiety answers have 4 level of scoring, "0" means never avoidance, "1" means occasionally avoidance, "2" means often avoidance, and "3" means usually avoidance. As seen from the Table 8 with statistical information including mean and standard deviation; most of the women undergoing infertility treatment answered 24 questions of the avoidance subscale of the Leibowitz Social Anxiety Scale around "2" scoring which means most of the women undergoing infertility treatment have often avoiding from those social environment, places, institutions, or people (M=1.92).

Fertility Quality of Life Scale (FertiQol). The second completed scale was the Fertility Quality of Life Scale (FertiQol), consists of 36 items scored according to 5 response categories. The response scale has a range of 0 to 4. Higher scores mean a higher quality of life. There are different categories to rate the items; evaluation, satisfaction, frequency, intensity, and capacity. Items are separated from the related rating categories. In total, FertiQol has two additional items, and core and treatment parts with six subscales. The Core FertiQol is the average fertility quality of life across all domains; whereas the Treatment FertiQol is the average quality of life across treatment domains. Items of each subscale are mixed designed including reversed questions, so there is no separation on the table below as it was on the Leibowitz Social Anxiety Scale. Question 4, 11, 14, 15, and 21 on the core treatment scale, and question 2, and 5 are the reversed items for the treatment subscale. Each item is separated according to its response categories and each items' mean scores are given consequently on the below table 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4h, and 4i. Total results of the core treatment scale were calculated by the given formula by the owner site of the scale (www.fertiqol.org). The formula is to reverse items first, then calculate raw scores by summing all items that belong to the subscale or total scale, and to compute scaled scores for the subscale and total scales, multiply the relevant raw score by 25/k (as cited from FertiQol scoring). Since this FertiQol scale has total scores calculated from its formula, it is not proper to compare the mean of the answers as it is on the other scales. Fertiqol's total scores comparison will be under the "testing between-group differences" (Table 12a & Table 12b).

Table 4a

Evaluation Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Very Poor	Poor	Neither Good nor Poor	Good	Very Good	*M* ± *SD*
A. How would you rate your health?	0.0	5.0	20.0	66.0	9.0	2.7900 ± .67112

Table 4b

Satisfaction Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*
B. Are you satisfied with your quality of life?	3.0	3.0	21.0	68.0	5.0	2.6900 ± .74799

Table 4c

Capacity Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Completely	A Great Deal	Moderately	Not Much	Not at All	*M* ± *SD*
Q1. Are your attention and concentration impaired by thoughts of infertility?	6.0	24.0	20.0	32.0	18.0	2.3200 ± 1.19663
Q2. Do you think you cannot move ahead with other life goals and plans because of fertility problems?	10.0	25.0	15.0	35.0	15.0	2.2000 ± 1.25529
Q3. Do you feel drained or worn out because of fertility problems?	7.0	18.0	30.0	25.0	20.0	2.3300 ± 1.18964
Q4R. Do you feel able to cope with your fertility problems?	3.0	30.0	29.0	23.0	15.0	2.1700 ± 1.11060
Total						2.255

Table 4d

Satisfaction Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*
Q5. Are you satisfied with the support you receive from friends with regard to your fertility problems?	2.0	5.0	29.0	40.0	24.0	2.7900 ± .93523

Q6. Are you satisfied with your sexual relationship even though you have fertility problems?	2.0	3.0	25.0	46.0	24.0	2.8700	±	.88369
Total mean			2.835					

Table 4e

Frequency Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Always	Very Often	Quite Often	Seldom	Never	*M* ± *SD*		
Q7. Do your fertility problems cause feelings of jealousy and resentment?	6.0	11.0	28.0	21.0	34.0	2.6600	±	1.22450
Q8. Do you experience grief and/or feelings of loss about not being able to have a child (or more children)?	13.0	19.0	38.0	15.0	15.0	2.0000	±	1.21439
Q9. Do you uctuate between hope and despair because of fertility problems?	8.0	25.0	36.0	18.0	13.0	2.0300	±	1.13222
Q10. Are you socially isolated because of fertility problems?	7.0	9.0	28.0	14.0	42.0	2.7500	±	1.28216
Q11R. Are you and your partner affectionate with each other even though you have fertility problems?	67.0	14.0	8.0	5.0	6.0	.6900	±	1.18658
Q12. Do your fertility problems interfere with your day-to-day work or obligations?	3.0	11.0	29.0	19.0	38.0	2.7800	±	1.15976
Q13. Do you feel uncomfortable attending social situations like holidays and celebrations because of your fertility problems?	5.0	6.0	28.0	16.0	45.0	2.9000	±	1.19342
Q14R. Do you feel your family can understand what you are going through?	26.0	20.0	30.0	17.0	7.0	1.5900	±	1.23987
Total Mean					2.175			

Table 4f

Intensity Response Category Items of the Core Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	An Extreme Amount	Very Much	A Moderate Amount	A Little	Not at All	*M* ± *SD*
Q15R. Have fertility problems strengthened your commitment to your partner?	30.0	17.0	41.0	9.0	3.0	1.3800 ± 1.09894
Q16. Do you feel sad and depressed about your fertility problems?	4.0	23.0	29.0	35.0	9.0	2.2200 ± 1.03064
Q17. Do your fertility problems make you inferior to people with children?	4.0	7.0	26.0	24.0	39.0	2.8700 ± 1.13400
Q18. Are you bothered by fatigue because of fertility problems?	6.0	16.0	24.0	26.0	28.0	2.5400 ± 1.22615
Q19. Have fertility problems had a negative impact on your relationship with your partner?	3.0	3.0	18.0	22.0	54.0	3.2100 ± 1.03763
Q20. Do you nd it dif cult to talk to your partner about your feelings related to infertility?	2.0	5.0	18.0	24.0	51.0	3.1700 ± 1.02548
Q21R. Are you content with your relationship even though you have fertility problems?	46.0	22.0	24.0	6.0	2.0	.9600 ± 1.06287
Q22. Do you feel social pressure on you to have (or have more) children? .	22.0	11.0	26.0	17.0	24.0	2.1000 ± 1.45990
Q23. Do your fertility problems make you angry?	12.0	6.0	32.0	31.0	19.0	2.3900 ± 1.21352
Q24. Do you feel pain and physical discomfort because of your fertility problems?	8.0	5.0	18.0	25.0	44.0	2.9200 ± 1.24462
Total mean					2.376	

Table 4g

Frequency Response Category Items of the Treatment Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Always	Very Often	Quite Often	Seldom	Never	*M* ± *SD*
T1. Does infertility treatment negatively affect your mood?	13.0	16.0	37.0	19.0	15.0	2.0700 ± 1.21651
T2R. Are the fertility medical services you would like available to you?	1.0	4.0	18.0	44.0	33.0	3.0400 ± .87525
Total mean					2.555	

Table 4h

Intensity Response Category Items of the Treatment Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	An Extreme Amount	Very Much	A Moderate Amount	A Little	Not at All	*M* ± *SD*

T3. How complicated is dealing with the procedure and/ or administration of medication for your infertility treatment(s)?	3.0	11.0	15.0	43.0	28.0	2.8200	± 1.05773
T4. Are you bothered by the effect of treatment on your daily or work- related activities?	3.0	20.0	21.0	29.0	27.0	2.5700	± 1.17426
T5R. Do you feel the fertility staff understand what you are going through?	5.0	29.0	27.0	22.0	17.0	2.1700	± 1.17254
T6. Are you bothered by the physical side effects of fertility medications and treatment?	12.0	16.0	30.0	24.0	18.0	2.2000	± 1.25529
Total mean					2.448		

Table 4i

Satisfaction Response Category Items of the Treatment Fertility Quality of Life Scale for Women Undergoing Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*
T7. Are you satisfied with the quality of services available to you to address your emotional needs?	5.0	70.0	13.0	11.0	1.0	1.3300 ± .77921
T8. How would you rate the surgery and/or medical treatment(s) you have received?		3.0	13.0	55.0	29.0	3.1000 ± .73168
T9. How would you rate the quality of information you received about medication, surgery and/or medical treatment?		3.0	14.0	60.0	23.0	3.0300 ± .70288
T10. Are you satisfied with your interactions with fertility medical staff?	2.0	3.0	9.0	56.0	30.0	3.0900 ± .82993
Total mean						2.6375

Healthy Lifestyle Behaviors Scale II. The final scale was the Healthy Lifestyle Behaviors Scale II which has 6 subscales as mental development, physical activity, health responsibility, interpersonal relations, nutrition, and stress management. It has 4 level of scoring by 4-point Likert type scale with 1 for “never”, 2 for “occasionally”, 3 for “frequent”, and 4 for “regular”. Higher scores mean that participant engages in more healthy lifestyle behaviors whereas lower scores means that participant has less healthy lifestyle behaviors. As seen from the table 10a, 10b, 10c,

10,d ,10e, and 10f with statistical information including mean and standard deviation; most of the women undergoing infertility treatment answered mental development items around "3" scoring which means most those women have frequent level of healthy mental development during this process (M=2.94) (Table 5a); the most chosen answer for physical activity was the "2" which means those women have occasionally level of physical activity (M=2.07) (Table 5b); for health responsibility; most of those women answered "3" meaning that those women getting their health responsibility at frequent level (M=2.48) (Table 5c). According to the interpersonal relations scores, women undergoing infertility treatment are frequent level of interpersonal relations (M=2.87) (Table 5d). Nutrition is around "2" which means occasional significance of nutrition during this process (M=2.45) (Table 5e). Stress management is also around "2" the meaning of occasional level stress managing in their life (M=2.45) (Table 5f).

Table 5a

Mental Development Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
6	Feel I am growing and changing in positive ways	3.0	34.0	43.0	20.0	2.8000	± .79137
12	Believe that my life has purpose	2.0	22.0	47.0	29.0	3.0300	± .77140
18	Look forward to the future	1.0	28.0	44.0	27.0	2.9700	± .77140
24	Feel content and at peace with myself	0.0	25.0	53.0	22.0	2.9700	± .68836
30	Work toward long-term goals in my life	10.0	28.0	37.0	25.0	2.7700	± .94125
36	Find each day interesting and challenging	11.0	56.0	24.0	9.0	2.3100	± .78746
42	Am aware of what is important to me in life.	2.0	26.0	46.0	26.0	2.9600	± .77746
48	Feel connected with some force greater than myself	3.0	10.0	22.0	65.0	3.4900	± .79766
52	Expose myself to new experiences and challenges	3.0	20.0	34.0	43.0	3.1700	± .85345
	Total					2.9411	±

Table 5b

Physical Activity Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
4	Follow a planned exercise program	28.0	50.0	10.0	12.0	2.0600	± .93008

10	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber	25.0	42.0	15.0	18.0	2.2600	± 1.03103
16	Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	18.0	47.0	13.0	22.0	2.3900	± 1.02391
22	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	42.0	48.0	8.0	2.0	1.7000	± .70353
28	Do stretching exercises at least 3 times per week.	39.0	42.0	13.0	6.0	1.8600	± .86480
34	Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walk	14.0	43.0	28.0	15.0	2.4400	± .91365
40	Check my pulse rate when exercising	29.0	37.0	26.0	8.0	2.1300	± .92829
46	Reach my target heart rate when exercising	42.0	40.0	18.0	0.0	1.7600	± .74019
	Total					2.0750	±

Table 5c

Health Responsibility Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
3	Report any unusual signs or symptoms to a physician or other health professional.	0.0	30.0	31.0	39.0	3.0900	± .82993
9	Read or watch TV programs about improving health.	15.0	56.0	23.0	6.0	2.2000	± .76541
15	Question health professionals in order to understand their instructions.	5.0	48.0	32.0	15.0	2.5700	± .80723
21	Get a second opinion when I question my health care provider's advice.	17.0	53.0	20.0	10.0	2.2300	± .85108
27	Discuss my health concerns with health professionals	3.0	28.0	44.0	25.0	2.9100	± .80522
33	Inspect my body at least monthly for physical changes/danger signs.	19.0	39.0	27.0	15.0	2.3800	± .96169
39	Ask for information from health professionals about how to take good care of myself.	11.0	50.0	25.0	14.0	2.4200	± .86667
45	Attend educational programs on personal health care.	45.0	40.0	11.0	4.0	1.7400	± .81178
51	Seek guidance or counseling when necessary	9.0	30.0	31.0	30.0	2.8200	± .96797
	TOTAL					2.4844	±

Table 5d

Interpersonal Relations Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
1	Discuss my problems and concerns with people close to me	6.0	54.0	26.0	14.0	2.4800	± .81004
7	Praise other people easily for their achievements.	2.0	19.0	54.0	25.0	3.0200	± .72446
13	Maintain meaningful and fulfilling relationships with others	2.0	23.0	43.0	32.0	3.0500	± .79614
19	Spend time with close friends	0.0	35.0	46.0	19.0	2.8400	± .72083
25	Find it easy to show concern, love and warmth to others.	0.0	25.0	46.0	29.0	3.0400	± .73745
31	Touch and am touched by people I care about.	4.0	12.0	44.0	40.0	3.2000	± .80403

37	Find ways to meet my needs for intimacy.	12.0	33.0	41.0	14.0	2.5700	± .87911
43	Get support from a network of caring people.	10.0	32.0	46.0	12.0	2.6000	± .82878
49	Settle conflicts with others through discussion and compromise.	1.0	24.0	42.0	33.0	3.0700	± .78180
	TOTAL					2.8744	±

Table 5e

Nutrition Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
2	Choose a diet low in fat, saturated fat, and cholesterol	16.0	42.0	34.0	8.0	2.3400	± .84351
8	Limit use of sugars and food containing sugar (sweets).	11.0	54.0	21.0	14.0	2.3800	± .86199
14	Eat 6-11 servings of bread, cereal, rice and pasta each day	42.0	47.0	8.0	3.0	1.7200	± .73964
20	Eat 2-4 servings of fruit each day	19.0	52.0	17.0	12.0	2.2200	± .89420
26	Eat 3-5 servings of vegetables each day	8.0	51.0	32.0	9.0	2.4200	± .76779
32	Eat 2-3 servings of milk, yogurt or cheese each day	7.0	42.0	29.0	22.0	2.6600	± .90140
38	Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	13.0	41.0	30.0	16.0	2.4900	± .91558
44	Read labels to identify nutrients, fats, and sodium content in packaged food.	14.0	27.0	40.0	19.0	2.6400	± .94836
50	Eat breakfast	7.0	17.0	30.0	46.0	3.1500	± .94682
	Total					2.4467	±

Table 5f

Stress Management Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	**Occasionally**	**Frequent**	**Regular**	***M* ± *SD***	
5	Get enough sleep	5.0	28.0	33.0	34.0	2.9600	± .90921
11	Take some time for relaxation each day	12.0	48.0	26.0	14.0	2.4200	± .87824
17	Accept those things in my life which I can not change.	10.0	47.0	26.0	17.0	2.5000	± .89330
23	Concentrate on pleasant thoughts at bedtime	6.0	43.0	32.0	19.0	2.6400	± .85894
29	Use specific methods to control my stress	16.0	50.0	22.0	12.0	2.3000	± .88192
35	Balance time between work and play	12.0	32.0	42.0	14.0	2.5800	± .87824
41	Practice relaxation or meditation for 15-20 minutes daily.	27.0	46.0	17.0	10.0	2.1000	± .91563
47	Pace myself to prevent tiredness.	19.0	57.0	19.0	5.0	2.1000	± .75879
	Total					2.4500	±

Women Conceived After Infertility Treatment

The majority of the women participants who conceived after infertility treatment, were 26-35 year old (51%), married between 0-5 years (54%), at least bachelor degree graduates 65%),

living with nuclear family members (88%), active working (52%), middle income (57%), actualizing necessity duties of religion (52%), not having any additional emotional crisis in last 6 months out of infertility issues (100%), not having any pregnancy process before (36%), none children (71%) with none miscarriage (41%). Tables 6a, 6b and 6c present these demographic data. In addition to those information, women conceived after infertility treatment who had miscarriage before answered that they mostly had one miscarriage (51.2%) with the reason of mostly thyroid illness (56.1%), most of them has no physical-chronic illness (80%), but whom has chronic illness answered with thyroid (55%). Table 6d present these demographic data.

Table 6a

Frequency Distribution for Age, Years of Marital Status, members living together, and Attending religious duties of Women Who Conceived After Infertility Treatment

Variable	*N*	%
Age		
18-25 years old	4	4.0
26-35 years old	51	51.0
36-45 years old	45	45.0
Years of Marital Status		
0-5 Years	54	54.0
5-8 Years	35	35.0
8^{+} Years	11	11.0
Members Living Together		
Nuclear Family	88	88.0
Husband's Family Members	10	10.0
My Family Members	2	2.0
Attending Religious Duties		
None	11	11.0
Little	30	30.0
Just do Necessities	52	52.0
Too much	7	7.0

Table 6b

Frequency Distribution for education, income status, and working status of Women Who Conceived After Infertility Treatment

Variable	*N*	%
Education		
Literate	1	1.0
Elementary School	7	7.0
High School	27	27.0
University/Master Degree+	65	65.0
Income Status		
Low (income is lower than outcome)	5	5.0
Middle (income is equal to outcome)	57	57.0
High (Income is higher than outcome)	38	38.0
Working Status		
Not Working	41	41.0
Never Worked	7	7.0
Working	52	52.0

Table 6c

Frequency Distribution for Pregnancy Numbers, Birth Numbers, and Pregnancy Loss of Women Who Conceived After Infertility Treatment

Variable	*N*	%
Pregnancy Number		
0	36	36.0
1	31	31.0
2	16	16.0
3^{+}	17	17.0
Birth Number		
0	71	71.0
1	26	26.0
2^{+}	3	3.0
Pregnancy Loss Before		
Yes	41	41.0
No	59	59.0

Table 6d

Frequency Distribution of Number of Miscarriage, Reason of Miscarriage, Physical Chronic Illness Status, & Type of Physical-Chronic Illness of Women Who Conceived After Infertility Treatment

Variable	N	%
Number of Miscarriage		
1.00	21	51.2
2.00	6	14.6
3.00	10	24.4
4.00	4	9.8
Total	41	100.0
Reason of Miscarriage		
Thyroid	23	56.1
Blood Pressure	2	4.9
Diabetes	10	24.4
Others	6	14.6
Total	41	100.0
Physical-Chronic Illness Status		
No	80	80.0
Yes	20	20.0
Type of Physical-Chronic Illness		
Thyroid	11	55.0
Others	9	45.0
Total	20	100.0

Most of the women who conceived after infertility treatment evaluated social support system as sufficient (67%), wanted to have a child between 1-2 years (53%), had infertility treatment less than 1 year (46%) with the infertility reason of unexplained infertility (37%), and conceived after one infertility treatment (48%). Table 6e present these demographic data.

Table 6d

Frequency Distribution of Social Support Evaluation, Duration of Wanting To have a Child, Duration of Infertility Treatment, Reason of Infertility, & Duration of Conceived Infertility Treatment of Women Who Conceived After Infertility Treatment

Variable	N	%
Social Support Evaluation		
Insufficient	33	33.0
Sufficient	67	67.0
Total	100	100.0
Duration of Wanting To have a Child		
Less than 1 year	9	9.0
1-2 years	53	53.0
3-5 years	24	24.0
6-10 years	12	12.0
11^{+} years	2	2.0
Total	100	100.0
Duration of Infertility Treatment		
Less than 1 year	46	46.0
1-2 years	36	36.0
3-5 years	11	11.0
6-10 years	5	5.0
11^{+} years	2	2.0
Total	100	100.0
Reason of Infertility		
Female Factors	24	24.0
Male Factors	26	26.0
Female and Male Factors	13	13.0
Unexplained Factors	37	37.0
Total	100	100.0
Duration of Conceived Infertility Treatment		
1	48	48.0
2	34	34.0
3 & more	18	18.0
Total	100	100.0

Questionnaire Answers of the Women Conceived After Infertility Treatment

Leibowitz Social Anxiety Scale. The answers of the women who conceived after infertility treatment for all of the three scales will be distributed in this part. As seen from the Table11a with statistical information including mean and standard deviation; most of the women conceived after infertility treatment answered 24 questions of the anxiety subscale of the Liebowitz Social Anxiety Scale around “2” scoring which means most of the women conceived after infertility treatment have moderate level of fear or anxiety (M=1.80) (Table7a). The Avoidance subscale of the Leibowitz Social Anxiety answers of the women conceived after infertility treatment showed that they have

around “2” level, often use avoidance from social environment, places, institutions, meetings, or people (M=1.74) (Table 7b).

Table 7a

Anxiety Subscales of the Social Anxiety Scale for Women Conceived After Infertility Treatment

	None or Too Mild	Mild	Moderate	Severe	*M* ± *SD*		
1. Speaking up at a meeting	15.0	32.0	40.0	13.0	2.5100	±	.90448
2. Acting, performing or giving a talk in front of an audience	22.0	26.0	31.0	21.0	2.5100	±	1.05883
3. Being the center of attention	22.0	29.0	36.0	13.0	2.4000	±	.97442
4. Trying to pick up someone	29.0	26.0	30.0	15.0	2.3100	±	1.05117
5. Giving a report to a group	42.0	28.0	27.0	3.0	1.9100	±	.90000
6. Entering a room when others are already seated	57.0	32.0	10.0	1.0	1.5500	±	.71598
7. Talking to people in authority	56.0	27.0	16.0	1.0	1.6200	±	.78855
8. Returning goods to a store	50.0	28.0	18.0	4.0	1.7600	±	.88899
9. Expressing a disagreement or disapproval to people you don’t know very well	37.0	23.0	37.0	3.0	2.0600	±	.93008
10. Working while being observed	26.0	44.0	27.0	3.0	2.0700	±	.80723
11. Talking with people you don’t know very well	55.0	28.0	16.0	1.0	1.6300	±	.78695
12. Going to a party	70.0	21.0	8.0	1.0	1.4000	±	.68165
13. Looking at people you don’t know very well in the eyes	54.0	21.0	18.0	7.0	1.7800	±	.98041
14. Taking a test	24.0	45.0	23.0	8.0	2.1500	±	.88048
15. Writing while being observed	51.0	32.0	16.0	1.0	1.6700	±	.77921
16. Calling someone you don’t know very well	71.0	13.0	13.0	3.0	1.4800	±	.83461
17. Eating in public places	80.0	5.0	11.0	4.0	1.3900	±	.83961
18. Giving a party	77.0	10.0	7.0	6.0	1.4200	±	.86667
19. Participating in small groups	73.0	11.0	12.0	4.0	1.4700	±	.85818
20. Drinking with others in public places	79.0	10.0	6.0	5.0	1.3700	±	.81222
21. Telephoning in public	77.0	12.0	6.0	5.0	1.3900	±	.81520
22. Meeting strangers	65.0	20.0	13.0	2.0	1.5200	±	.79747
23. Resisting a high pressure salesperson	55.0	29.0	7.0	9.0	1.7000	±	.94815
24. Urinating in a public bathroom	44.0	14.0	26.0	16.0	2.1400	±	1.15488
Total					1.8004	±	

Table 7b

Avoidance Subscale of the Leibowitz Social Anxiety Scale for Women Conceived After Infertility Treatment

	None or Too Mild	Mild	Moderate	Severe	*M* ± *SD*		
1. Speaking up at a meeting	27.0	32.0	25.0	16.0	2.3000	±	1.03962
2. Acting, performing or giving a talk in front of an audience	27.0	32.0	27.0	14.0	2.2800	±	1.01583
3. Being the center of attention	25.0	33.0	26.0	16.0	2.3300	±	1.02548
4. Trying to pick up someone	28.0	25.0	18.0	29.0	2.4800	±	1.18475
5. Giving a report to a group	43.0	29.0	22.0	6.0	1.9100	±	.94383
6. Entering a room when others are already seated	60.0	33.0	4.0	3.0	1.5000	±	.71774
7. Talking to people in authority	64.0	25.0	8.0	3.0	1.5000	±	.77198
8. Returning goods to a store	57.0	25.0	6.0	12.0	1.7300	±	1.02351
9. Expressing a disagreement or disapproval to people you don't know very well	45.0	33.0	17.0	5.0	1.8200	±	.89194
10. Working while being observed	41.0	40.0	16.0	3.0	1.8100	±	.81271
11. Talking with people you don't know very well	65.0	26.0	6.0	3.0	1.4700	±	.74475
12. Going to a party	73.0	20.0	4.0	3.0	1.3700	±	.70575
13. Looking at people you don't know very well in the eyes	57.0	20.0	14.0	9.0	1.7500	±	1.00880
14. Taking a test	33.0	51.0	10.0	6.0	1.8900	±	.81520
15. Writing while being observed	58.0	30.0	9.0	3.0	1.5700	±	.78180
16. Calling someone you don't know very well	70.0	21.0	7.0	2.0	1.4100	±	.71202
17. Eating in public places	79.0	10.0	9.0	2.0	1.3400	±	.72780
18. Giving a party	70.0	18.0	6.0	6.0	1.4800	±	.85847
19. Participating in small groups	77.0	12.0	6.0	5.0	1.3900	±	.81520
20. Drinking with others in public places	83.0	10.0	2.0	5.0	1.2900	±	.74257
21. Telephoning in public	65.0	22.0	7.0	6.0	1.5400	±	.86946
22. Meeting strangers	58.0	30.0	7.0	5.0	1.5900	±	.82993
23. Resisting a high pressure salesperson	56.0	18.0	17.0	9.0	1.7900	±	1.02784
24. Urinating in a public bathroom	42.0	13.0	32.0	13.0	2.1600	±	1.11663
Total					1.7375	±	

Fertility Quality of Life Scale (FertiQol). The fertility quality of life scores of the women conceived after infertility treatment are shown in the below table 8a, 8b, 8c, 8d, 8e, 8f, 8g, 8h, and 8i. the mean scores are calculated for each item because of the scale's formula. The total mean is given in the below at table 12a and table 12b.

Table 8a

Evaluation Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Very Poor	Poor	Neither Good nor Poor	Good	Very Good	*M* ± *SD*	
A. How would you rate your health?	0.0	2.0	17.0	74.0	7.0	2.8600	± .55085

Table 8b

Satisfaction Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*	
B. Are you satisfied with your quality of life?	4.0	11.0	18.0	54.0	13.0	2.6100	± .98365

Table 8c

Capacity Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Completely	A Great Deal	Moderately	Not Much	Not at All	*M* ± *SD*	
Q1. Are your attention and concentration impaired by thoughts of infertility?	8.0	14.0	31.0	26.0	21.0	2.3800	± 1.19578
Q2. Do you think you cannot move ahead with other life goals and plans because of fertility problems?	6.0	28.0	20.0	27.0	19.0	2.2500	± 1.22578
Q3. Do you feel drained or worn out because of fertility problems?	10.0	18.0	25.0	25.0	22.0	2.3100	± 1.27679
Q4R. Do you feel able to cope with your fertility problems?	2.0	32.0	29.0	21.0	16.0	2.1700	± 1.11060
Total						2.2775	

Table 8d

Satisfaction Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*	
Q5. Are you satisfied with the support you receive from friends with regard to your fertility problems?	0	0	34.0	55.0	11.0	2.7700	± 0.63333
Q6. Are you satisfied with your sexual relationship even though you have fertility problems?	0.0	11.0	22.0	49.0	18.0	2.7400	± 0.88329
Total mean						2.7550	

Table 8e

Frequency Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Always	Very Often	Quite Often	Seldom	Never	*M* ± *SD*	
Q7. Do your fertility problems cause feelings of jealousy and resentment?	4.0	7.0	36.0	20.0	33.0	2.7100	± 1.12182
Q8. Do you experience grief and/or feelings of loss about not being able to have a child (or more children)?	20.0	5.0	45.0	15.0	15.0	2.0000	± 1.27128
Q9. Do you uctuate between hope and despair because of fertility problems?	13.0	20.0	33.0	24.0	10.0	1.9800	± 1.17189
Q10. Are you socially isolated because of fertility problems?	8.0	17.0	17.0	25.0	33.0	2.5800	± 1.31947
Q11R. Are you and your partner affectionate with each other even though you have fertility problems?	64.0	16.0	9.0	3.0	8.0	.7500	± 1.23399
Q12. Do your fertility problems interfere with your day-to-day work or obligations?	2.0	10.0	40.0	12.0	36.0	2.7000	± 1.12367
Q13. Do you feel uncomfortable attending social situations like holidays and celebrations because of your fertility problems?	5.0	11.0	30.0	11.0	43.0	2.7600	± 1.25626
Q14R. Do you feel your family can understand what you are going through?	19.0	15.0	41.0	12.0	13.0	1.8500	± 1.24215
Total mean						2.3686	

Table 8f

Intensity Response Category Items of the Core Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	An Extreme Amount	Very Much	A Moderate Amount	A Little	Not at All	*M* ± *SD*	
Q15R. Have fertility problems strengthened your commitment to your partner?	22.0	24.0	35.0	7.0	12.0	1.6300	± 1.24442
Q16. Do you feel sad and depressed about your fertility problems?	8.0	9.0	36.0	35.0	12.0	2.3400	± 1.06572
Q17. Do your fertility problems make you inferior to people with children?	6.0	7.0	21.0	26.0	40.0	2.8700	± 1.19473
Q18. Are you bothered by fatigue because of fertility problems?	6.0	11.0	28.0	30.0	25.0	2.5700	± 1.15693
Q19. Have fertility problems had a negative impact on your relationship with your partner?	3.0	7.0	15.0	14.0	61.0	3.2300	± 1.12685
Q20. Do you find it difficult to talk to your partner about your feelings related to infertility?	5	3	11	26	55	3.2300	± 1.09041
Q21R. Are you content with your relationship even though you have fertility problems?	51.0	18.0	22.0	3.0	6.0	.9500	± 1.18386
Q22. Do you feel social pressure on you to have (or have more) children?	17.0	2.0	31.0	32.0	18.0	2.3200	± 1.28613
Q23. Do your fertility problems make you angry?	8.0	5.0	34.0	23.0	30.0	2.6200	± 1.19578
Q24. Do you feel pain and physical discomfort because of your fertility problems?	5.0	4.0	26.0	27.0	38.0	2.8900	± 1.11821
Total mean						2.6333	

Table 8g

Frequency Response Category Items of the Treatment Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	Always	Very Often	Quite Often	Seldom	Never	*M* ± *SD*	
T1. Does infertility treatment negatively affect your mood?	4.0	12.0	50.0	23.0	11.0	2.2500	± .94682
T2R. Are the fertility medical services you would like available to you?	26.0	50.0	19.0	4.0	1.0	1.0400	± .83991
Total mean						1.6450	

Table 8h

Intensity Response Category Items of the Treatment Fertility Quality of Life Scale for Women Conceived After Infertility Treatment

	An Extreme Amount	Very Much	A Moderate Amount	A Little	Not at All	*M* ± *SD*
T3. How complicated is dealing with the procedure and/ or administration of medication for your infertility treatment(s)?	3.0	10.0	26.0	32.0	29.0	2.7400 ± 1.07891
T4. Are you bothered by the effect of treatment on your daily or work- related activities?	2.0	11.0	28.0	28.0	31.0	2.7500 ± 1.07661
T5R. Do you feel the fertility staff understand what you are going through?	2.0	13.0	38.0	32.0	15.0	2.4500 ± .96792
T6. Are you bothered by the physical side effects of fertility medications and treatment?	8.0	12.0	39.0	29.0	12.0	2.2500 ± 1.07661
Total mean						2.5475

Table 8i

Satisfaction Response Category Items of the Treatment Fertility Quality of Life Scale for Women Conceived After3 Infertility Treatment

	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	*M* ± *SD*
T7. Are you satisfied with the quality of services available to you to address your emotional needs?	4.0	10.0	55.0	30.0	1.0	2.1400 ± .76568
T8. How would you rate the surgery and/or medical treatment(s) you have received?	0.0	2.0	17.0	55.0	26.0	3.0500 ± .71598
T9. How would you rate the quality of information you received about medication, surgery and/or medical treatment?	4.0	4.0	15.0	53.0	24.0	2.8900 ± .95235
T10. Are you satisfied with your interactions with fertility medical staff?	0	4.0	13.0	45.0	38.0	3.1700 ± .80472
Total mean						2.8125

Healthy Lifestyle Behaviors Scale II. The healthy lifestyle behavior scale scores for women conceived after infertility treatment are shown in the below table 9a, 9b, 9c, 9d, 9e, and 9f. As seen from the tables, most of the women conceived after infertility treatment answered mental development items around "3" scoring which means most those women have frequent level of healthy mental development during this process (M=2.87) (Table 9a); the most chosen answer for physical activity was the "2" which means those women have occasionally level of physical activity (M=1.93) (Table 9b); for health responsibility; most of those women answered "2" meaning that those women getting their health responsibility at occasional level (M=2.41) (Table 9c). According to the interpersonal relations scores, women undergoing infertility treatment are frequent level ("3") of interpersonal relations (M=2.86) (Table 9d). Nutrition is around "2" which means occasional significance of nutrition during this process (M=2.28) (Table 9e). Stress management is also around "2" the meaning of occasional level stress managing in their life (M=2.4) (Table 9f).

Table 9a

Mental Development Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
6	Feel I am growing and changing in positive ways	2.0	42.0	43.0	13.0	2.6700	± .72551
12	Believe that my life has purpose	10.0	18.0	34.0	38.0	3.0000	± .98473
18	Look forward to the future	2.0	27.0	36.0	35.0	3.0400	± .83991
24	Feel content and at peace with myself	0	34.0	44.0	22.0	2.8800	± .74237
30	Work toward long-term goals in my life	0	39.0	42.0	19.0	2.8000	± .73855
36	Find each day interesting and challenging	15.0	61.0	18.0	6.0	2.1500	± .74366
42	Am aware of what is important to me in life.	8.0	13.0	45.0	34.0	3.0500	± .89188
48	Feel connected with some force greater than myself	7.0	8.0	28.0	57.0	3.3500	± .90314
52	Expose myself to new experiences and challenges	8.0	23.0	38.0	31.0	2.9200	± .92856
	Total					2.8733	±

Table 9b

Physical Activity Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
4	Follow a planned exercise program	33.0	46.0	17.0	4.0	1.9200	± .81253

10	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber	29.0	43.0	15.0	13.0	2.1200	±	.97732
16	Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	26.0	44.0	22.0	8.0	2.1200	±	.89081
22	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	35.0	45.0	16.0	4.0	1.8900	±	.81520
28	Do stretching exercises at least 3 times per week.	50.0	39.0	9.0	2.0	1.6300	±	.73382
34	Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walk	19.0	39.0	29.0	13.0	2.3600	±	.93765
40	Check my pulse rate when exercising	47.0	31.0	12.0	10.0	1.8500	±	.98857
46	Reach my target heart rate when exercising	56.0	36.0	6.0	2.0	1.5400	±	.70238
	Total					1.9288	±	

Table 9c

Health responsibility Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	M ± SD		
3	Report any unusual signs or symptoms to a physician or other health professional.	4.0	36.0	38.0	22.0	2.7800	±	.83581
9	Read or watch TV programs about improving health.	15.0	44.0	32.0	9.0	2.3500	±	.84537
15	Question health professionals in order to understand their instructions.	3.0	30.0	55.0	12.0	2.7600	±	.69805
21	Get a second opinion when I question my health care provider's advice.	16.0	52.0	24.0	8.0	2.2400	±	.81798
27	Discuss my health concerns with health professionals	6.0	25.0	47.0	22.0	2.8500	±	.83333
33	Inspect my body at least monthly for physical changes/danger signs.	22.0	50.0	19.0	9.0	2.1500	±	.86894
39	Ask for information from health professionals about how to take good care of myself.	20.0	47.0	25.0	8.0	2.2100	±	.85629
45	Attend educational programs on personal health care.	46.0	41.0	9.0	4.0	1.7100	±	.79512
51	Seek guidance or counseling when necessary	12.0	33.0	32.0	23.0	2.6600	±	.96630
	TOTAL					2.4122	±	

Table 9d

Interpersonal Relations Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
1	Discuss my problems and concerns with people close to me	10.0	39.0	30.0	21.0	2.6200	± .92965
7	Praise other people easily for their achievements.	4.0	38.0	33.0	25.0	2.7900	± .86801
13	Maintain meaningful and fulfilling relationships with others	2.0	22.0	47.0	29.0	3.0300	± .77140
19	Spend time with close friends	4.0	23.0	42.0	31.0	3.0000	± .84087
25	Find it easy to show concern, love and warmth to others.	2.0	21.0	47.0	30.0	3.0500	± .77035
31	Touch and am touched by people I care about.	0	10.0	50.0	40.0	3.3000	± .64354
37	Find ways to meet my needs for intimacy.	7.0	57.0	19.0	17.0	2.4600	± .85776
43	Get support from a network of caring people.	7.0	50.0	26.0	17.0	2.5300	± .85818
49	Settle conflicts with others through discussion and compromise.	7.0	27.0	30.0	36.0	2.9500	± .95743
	TOTAL					2.8589	±

Table 9e

Nutrition Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
2	Choose a diet low in fat, saturated fat, and cholesterol	11.0	59.0	16.0	14.0	2.3300	± .85345
8	Limit use of sugars and food containing sugar (sweets).	16.0	65.0	7.0	12.0	2.1500	± .83333
14	Eat 6-11 servings of bread, cereal, rice and pasta each day	40.0	45.0	7.0	8.0	1.8300	± .87681
20	Eat 2-4 servings of fruit each day	21.0	48.0	23.0	8.0	2.1800	± .85729
26	Eat 3-5 servings of vegetables each day	14.0	66.0	18.0	2.0	2.0800	± .63054
32	Eat 2-3 servings of milk, yogurt or cheese each day	15.0	38.0	32.0	15.0	2.4700	± .92611
38	Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	12.0	58.0	24.0	6.0	2.2400	± .74019
44	Read labels to identify nutrients, fats, and sodium content in packaged food.	31.0	40.0	11.0	18.0	2.1600	± 1.06097
50	Eat breakfast	13.0	16.0	25.0	46.0	3.0400	± 1.07233
	Total					2.2756	±

Table 9f

Stress Management Subscale of the Healthy Lifestyle Behavior II Scale for Women Undergoing Infertility Treatment

		Never	Occasionally	Frequent	Regular	*M* ± *SD*	
5	Get enough sleep	4.0	36.0	38.0	22.0	2.7800	± .83581

11	Take some time for relaxation each day	9.0	42.0	37.0	12.0	2.5200	±	.82241
17	Accept those things in my life which I can not change.	5.0	47.0	34.0	14.0	2.5700	±	.79462
23	Concentrate on pleasant thoughts at bedtime	11.0	41.0	34.0	14.0	2.5100	±	.87033
29	Use specific methods to control my stress	20.0	46.0	28.0	6.0	2.2000	±	.82878
35	Balance time between work and play	7.0	41.0	39.0	13.0	2.5800	±	.80629
41	Practice relaxation or meditation for 15-20 minutes daily.	38.0	36.0	23.0	3.0	1.9100	±	.85393
47	Pace myself to prevent tiredness.	19.0	57.0	16.0	8.0	2.1300	±	.81222
	Total					2.4000	±	

Research Questions and Hypothesis Testing

Three research questions addressed the difference on social anxiety, quality of life, and healthy life style behaviors of women undergoing infertility treatment as compared to women who conceived after infertility treatment. The first question compared the social anxiety differences on anxiety and avoidance levels of women undergoing infertility treatment and women who conceived after infertility treatment. The second question aimed to understand the fertility related quality of life effect on women undergoing infertility treatment and women who conceived after infertility treatment. The third question aimed to determine the healthy life style behavior differences on health responsibility, physical activity, nutrition, mental development, interpersonal relationships and stress management levels of women undergoing infertility treatment and women who conceived after infertility treatment.

Normally Distributed Tests

In the study, normality tests were applied to determine which method would be appropriate during the testing of hypotheses. In this study, if the sub-dimension scores and total scores obtained from the scales showed normal distribution, the t-test would be preferred for both groups; if not normally distributed, the Mann-Whitney-U test would be used. Normal distribution tests were carried out with Kolmogorov-Smirnov, and Shapiro-Wilk tests in SPSS program. (H_0: normal distribution is provided; H_1: normal distribution is not provided).

Table 10

Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ANXIETY	.154	200	.000	.900	200	.000
AVOIDANCE	.165	200	.000	.887	200	.000
TOTAL LSPS	.139	200	.000	.899	200	.000
EMOTIONAL	.145	200	.000	.961	200	.000
MINDBODY	.119	200	.000	.966	200	.000
RELATIONAL	.226	200	.000	.874	200	.000
SOCIAL	.117	200	.000	.952	200	.000
TOTAL FQ_24	.098	200	.000	.954	200	.000
ENVIRONMENT	.131	200	.000	.918	200	.000
TOLERANCE	.107	200	.000	.973	200	.001
TOTAL FQ_10	.093	200	.000	.951	200	.000
MENTAL DEVELOPMENT	.064	200	.034	.985	200	.028
NUTRITION	.090	200	.000	.975	200	.001
PHYSICAL ACTIVITY	.114	200	.000	.969	200	.000
HEALTH RESPONSIBILITY	.065	200	.039	.979	200	.004
INTERPERSONAL REL.	.077	200	.006	.987	200	.037
STRESS MANAGEMENT	.062	200	.035	.985	200	.029
TOTAL HLBS	.051	200	.000	.988	200	.006

As can be seen from the Table 10, the results of the normality tests showed that there is a significant difference of results (p <0.05) which means H_1 hypothesis was confirmed that distribution of data in this study was not in normally. In this case, non-parametric methods will be used.

Testing Between Group Differences

There are two different groups of women: those undergoing infertility treatment and those who conceived after infertility treatment. The main hypothesis is that these two groups differ significantly in terms of social anxiety, fertility quality of life, and healthy lifestyle behavior. In the first part, research question and hypothesis related with the Liebowitz Social Anxiety Scale consisting anxiety and avoidance subscales; in the second part, the Fertility Quality of Life Scale consisting the subscales (mind-body, relational, social, environment, and tolerance), and the third part, healthy lifestyle behaviors with the subscales (mental development, nutrition, physical activity, health responsibility, interpersonal relations, and stress management) were evaluated and statistical results are distributed with table 11, 12a, 12b, and 13.

Leibowitz Social Anxiety Scale Scores. Research Question #1: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score?

$H1_0$: Women undergoing infertility treatment will not have higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score.

$H1_a$: Women undergoing infertility treatment will have a higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score.

The null hypothesis predicted that women undergoing infertility treatment will not have higher social anxiety than women who conceived after infertility treatment on each of the social anxiety subscales and the overall social anxiety score. Contrary, the alternative hypothesis predicted that women undergoing infertility treatment will have higher levels of anxiety and avoidance and

total social anxiety than women who conceived after infertility treatment as measured by the subcategories and overall of the Leibowitz Social Anxiety Scale. The results of the Mann-Whitney U Test for Leibowitz Social Anxiety Scale with subscales indicated that there is a significant difference on Liebowitz Social Anxiety Scale total score and subscale scores ($p<0.05$). When the mean rank values were determined in order to determine which groups differed, higher scores were obtained for those women undergoing infertility treatment which means null hypothesis is rejected and the alternative hypothesis (1a) is confirmed that women undergoing infertility treatment have a higher social anxiety than women who conceived after infertility treatment. This result can be interpreted as women undergoing infertility treatment are having more anxiety and tendency of avoidance. Values for the Mann-Whitney U Test for the Leibowitz Social Anxiety Scale are presented in Table 11.

Table 11

Social Anxiety Scale Mann-Whitney U Test Results

	GROUP	N	mean	St deviation	Mean Rank	Mann-Whitney U	p
ANXIETY	UIT	100	1.9898	.61543	**110.63**		
	CAIT	100	1.8004	.55634	90.37	3987.0	0.01*
	Total	200					
AVOIDANCE	UIT	100	1.9292	.62574	**109.97**		
	CAIT	100	1.7375	.56972	91.04	4053.2	0.02*
	Total	200					
TOTAL SOCIAL PHOBIA	UIT	100	1.9595	.59912	**111.00**		
	CAIT	100	1.7690	.55213	90.01	3950.5	0.01*
	Total	200					

*significant at level 0.05

Fertility Quality of Life Scale Scores. Research Question #2: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score?

$H2_0$: Women undergoing infertility treatment will not have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score.

$H2_a$: Women undergoing infertility treatment will have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score.

The null hypothesis predicted that women undergoing infertility treatment will not have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score. The alternative hypothesis predicted that women undergoing infertility treatment would have lower quality of life than women who conceived after infertility treatment on each of the fertility quality of life subscales and the overall quality of life score. The results of the Mann-Whitney U Test for the Fertility Quality of Life Scale with subscales indicated that there is no significant difference on fertility quality of life total score and four subscale scores (p>0.05) . The results indicated that the null hypothesis is confirmed and alternative hypothesis is rejected. Results indicate that there is no difference between the two groups' fertility quality of life. Values for the Mann-Whitney U Test for the Fertility Quality of Life Scale are presented in Table 12a.

Table 12a

FQ24 Scale Mann-Whitney U Test Results

	GROUP	N	*M*	St deviation	*M* Rank	Mann-Whitney U	p
EMOTIONAL	UIT	100	54.7083	18.25029	98.38		
	CAIT	100	56.1667	18.89077	102.63	4787.5	0.602
	Total	200					
MIND BODY	UIT	100	62.8750	23.28648	100.99		
	CAIT	100	62.9167	23.36476	100.01	4951.0	0.905
	Total	200					
RELATIONAL	UIT	100	51.1667	9.89352	99.55		
	CAIT	100	52.2083	13.76784	101.46	4904.5	0.811
	Total	200					
SOCIAL	UIT	100	62.5000	18.07983	102.09		
	CAIT	100	63.2084	14.67538	98.91	4841.0	0.696
	Total	200					
Total FQ_24	UIT	100	57.8125	14.23992	98.47		
	CAIT	100	58.6250	14.31646	102.54	4796.5	0.619
	Total	200					

For the treatment module of the Fertility Quality of Life Scale, statistical results were similar to the other part of the FertiQol scale that there is no significant difference on treatment

environment and treatment tolerance subscales and in total score of the treatment module. Values for the Mann-Whitney U Test for the Fertility Quality of Life Scale Optional Treatment Model are presented in Table 12b.

Table 12b

FQ10 Scale Mann-Whitney U Test Results

	GROUP	N	mean	St deviation	Mean Rank	Mann-Whitney U	p
ENVIRONMENT	UIT	100	55.5834	9.77123	93.94		
	CAIT	100	57.6666	9.85159	107.07	4343.5	0.104
	Total	200					
TOLERANCE	UIT	100	40.2500	13.31146	98.27		
	CAIT	100	41.6249	12.58377	102.74	4776.5	0.583
	Total	200					
Total FQ10	UIT	100	47.9167	9.15553	94.66		
	CAIT	100	49.6459	8.99640	106.34	4416.0	0.152
	Total	200					

Healthy Lifestyle Behaviors Scale. Research Question #3: Is there a difference between women undergoing infertility treatment and women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score?

$H3_0$: Women undergoing infertility treatment will not have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score.

$H3_a$: Women undergoing infertility treatment will have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score.

The null hypothesis predicted that women undergoing infertility treatment will not have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score. The alternative hypothesis predicted that women undergoing infertility treatment will have lower healthy lifestyle behaviors than women who conceived after infertility treatment on each of the healthy life behavior style subscales and the overall healthy lifestyle behaviors score. The results of the Mann-Whitney U Test for the Healthy Lifestyle Behaviors Scale with six subscales indicated

that there is a significant difference on healthy lifestyle behaviors total score and nutrition subscale score between two groups ($p<0.05$). The mean rank values were evaluated and results indicate that women undergoing infertility treatment have higher scores on nutrition than women who conceived after infertility treatment. The other subscales and total score's statistical results did not show statistically significant results. The results indicated that the null hypothesis is confirmed that women undergoing infertility treatment don't have lower healthy lifestyle behaviors than women conceived after infertility treatment on mental development, physical activity, health responsibility, interpersonal relations, and stress management; whereas the null hypothesis is not confirmed and opposite of the first hypothesis on one subscale that women undergoing infertility treatment have higher nutrition than women conceived after infertility treatment. Values for the Mann-Whitney U Test for the Healthy Lifestyle Behaviors Scale are presented in Table 13.

Table 13

Healthy Lifestyle Behaviors Scale Mann-Whitney U Test Results

	GROUP	N	*M*	St deviation	*M* Rank	Mann-Whitney U	p
MENTAL DEVELOPMENT	UIT	100	2.9412	.49828	102.54		
	CAIT	100	2.8734	.51588	98.46	4796.0	0.617
	Total	200					
NUTRITION	UIT	100	2.4467	.48801	112.11		
	CAIT	100	2.2755	.37319	88.90	3839.5	0.004*
	Total	200					
PHYSICAL ACTIVITY	**UIT**	**100**	2.0750	.63614	**107.59**		
	CAIT	100	1.9288	.55484	93.42	4291.5	0.083
	Total	200					
HEALTH RESPONSBILITY	UIT	100	2.4845	.54761	102.97		
	CAIT	100	2.4109	.47937	98.04	4753.5	0.546
	Total	200					
INTERPERSONAL RELATIONS	UIT	100	2.8745	.47500	100.04		
	CAIT	100	2.8614	.51466	100.97	4953.5	0.909
	Total	200					
STRESS MANAGEMENT	UIT	100	2.4500	.46906	102.83		
	CAIT	100	2.4000	.46872	98.18	4767.5	0.569
	Total	200					
Total HLBS	UIT	100	2.5453	.42841	105.45		
	CAIT	100	2.4583	.38208	95.56	4505.5	0.227
	Total	200					

*significant at level 0.05

Summary

The purpose of the current study was to quantitatively determine whether social anxiety, quality of life, and healthy life style behaviors of women undergoing infertility treatment are different as compared to women who conceived after infertility treatment. For the statistical analyses of the study, The Mann Whitney-U was performed to examine the difference of two levels of one independent variable (undergoing infertility treatment and conceived after infertility treatment) and three dependent variables (social anxiety, quality of life, and healthy lifestyle behaviors).

The statistical analysis of the study data supported hypothesis 1; but not confirmed hypothesis 2, and partly confirmed hypothesis 3 in opposite way. Women undergoing infertility treatment have higher level of social anxiety, feeling more anxious and using avoidance more than women conceived after infertility treatment. There is no difference on quality of life level related with fertility issues on both groups. And there is no difference on healthy lifestyle behaviors rather

than higher nutrition on women undergoing infertility treatment. To summarize these results; it can be said that women undergoing infertility treatment have more serious level of social anxiety and avoidance from environment and have more knowledge about nutrition.

The following chapter summarizes the study and presents conclusion about the findings. Also, Chapter 5 will address the social change implications of these findings, the limitations of this study, and future recommendations for continued research in this area.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative study was to examine social anxiety, quality of life, and healthy lifestyle behaviors of women undergoing infertility treatment compared to women who conceived after infertility treatment. The data were analyzed using a Mann-Whitney U test rather than MANOVA because the data were not normally distributed. Participants included 100 women undergoing infertility treatment and 100 women who had conceived after infertility treatment. Previous studies indicated the negative psychological effect of infertility treatment on women, men, and couples and the differences with women who conceived without fertility treatment (Açmaz et al., 2013; Altıntop & Kesgin, 2018; Ataman & Arslan, 2010; Çavuşoğlu, 2015; Dejin-Karlsson & Ostergren, 2004; Demirci et al., 2016; Dilbaz et al., 2012; Dural et al., 2016; Karabulut et al., 2013; Karlidere et al., 2008; Kuş, 2008; Sezgin & Hocaoglu, 2014; Sharma et al., 2013; Ugur, 2014; Yağmur & Oltuluoğlu, 2011). No study could be found in the literature comparing Turkish women undergoing infertility treatment and women who conceived after infertility treatment on the social anxiety, quality of life, and healthy lifestyle behaviors by using validated and reliable measures. The current study was the first to address these variables with women undergoing infertility treatment and women who conceived after infertility treatment in Turkey. Previous studies mostly related on fertility quality of life and healthy lifestyle behaviors on women undergoing infertility treatment, but not social anxiety. This study was the first to include these three variables on women undergoing infertility treatment and women conceived after infertility treatment in Turkey.

Results

Mann-Whitney U tests were conducted to evaluate three dependent variables (social anxiety, quality of life, and healthy lifestyle behaviors) on two levels of an independent variable (women undergoing infertility treatment and women who conceived after infertility treatment). Results indicated a significant difference in social anxiety with women undergoing infertility treatment having higher social anxiety, avoidance, and anxiety than women who conceived after infertility treatment. However, no statistically significant differences between the two groups' fertility quality

of life scores were found. With regard to healthy lifestyle behaviors, a significant difference on healthy lifestyle behaviors total score and nutrition subscale score was found; however, no statistically significant difference was found on mental development, physical activity, health responsibility, interpersonal relations, or stress management scores. The women undergoing infertility treatment were found to have a significantly higher level of nutrition healthy lifestyle behaviors than women who conceived after infertility treatment. Overall, women undergoing infertility treatment were found to have higher levels of social anxiety and avoidance and more knowledge about nutrition than women who conceived after infertility treatment.

Interpretation of the Findings

The current study was based on the social support and stress buffering theory and the health promotion model as the conceptual framework. According to the social support and stress buffering theory (Cobb, 1976), women with infertility issues need to have a supportive social relationship to overcome negatively affected sense of self-worth, thinking ability, and coping skills and to experience a positive pregnancy outcome with healthy psychological well-being (Berger et al., 2013; Jahromi & Ramezanll, 2014; Martins et al., 2013; Pedro, 2015). The health promotion model suggests that to change a behavior or action, there must be a motivational need coming from an individual character; sociocultural, biological, and psychological factors; and experiences or visually seen changes (Pender et al., 2002). According to the health promotion model, fear or threats will not work to change actions, habits, or behaviors (Harrison, 1997; Pender, 2000). To change a behavior, an individual has to have a motivated expectancy from the result of the changed behavior, and has to see the gain to change the behavior. According to health promotion model, seeing the outcome can occur by expectancy or learning from someone else. In the current study, the health promotion model suggested that women who have infertility issues might change their healthy lifestyle behaviors to get infertility treatment based on their motivational need to get pregnant.

The current study addressed the difference in social anxiety, quality of life, and healthy lifestyle behaviors between women undergoing infertility treatment and women who conceived after infertility treatment. All cultures have specific meaning for being infertile and its effect on women. In Turkish culture, women who have infertility issues have a heightened likelihood of experiencing violence, threats of divorce, or their husbands marrying another woman while remaining married (Ozturk, 2016; Topdemir Kocyigit, 2012). This might explain why the women undergoing infertility treatment in the current study had higher social anxiety, avoidance, and fear levels compared to women who had conceived after infertility treatment. The results of this study are consistent with Yılmaz and Oskay's (2017) research, which indicated that infertile Turkish women use active avoidance, active confronting, and passive avoidance coping methods. Also, Gokler et al. (2014) found high levels of loneliness in women with infertility issues, which might be explained using self-imposed isolation coping strategies of infertile Turkish women. Also, from the fertility-related quality of life scale's social items, women undergoing infertility treatment and women who conceived after infertility treatment both showed medium-level effects from social interactions such as social inclusion, expectation, stigma, and support because of infertility issues (see Enache & Matei, 2016). These results reflect the importance of examining the social impact and social obstacles faced by women struggling with infertility in Turkish culture.

Some studies showed that women who have infertility issues have higher anxiety levels than women who become pregnant without infertility treatment (Albayrak & Günay, 2009). Also, Karlıdere et al. (2008) showed that women undergoing infertility treatment have higher anxiety and depression levels than women who conceived after infertility treatment. In a study on the diverse anxiety levels of different groups, Gülseren et al. (2006) found a decrease in the levels of anxiety and depression among women who conceived after infertility treatment. This might be one of the reason of the result of the current study that women who conceive after infertility treatment have lower levels of anxiety than women who are undergoing infertility treatment.

In the literature about the quality of life of women undergoing infertility treatment and conceiving after infertility treatment, Romano et al. (2012) found that women with inferility issues and who concieved after infertility issues do not have any difference on their ocping strategy or anxiety levels; they both have the similar coing and anxiety issues. Also, other studies indicated the low quality of life of women having infertility issues compared to women who became pregnant without infertility treatment (Ashraf, Ali, & Azadeh, 2014; Çavuşoğlu, 2015; Huppelschoten et al., 2013; Kızılkaya Beji & Kaya, 2017; Zeren, 2016). In addition, Çavuşoğlu (2015) showed that women who conceived after infertility treatment displayed low quality of life compared to women who became pregnant without infertility treatment. In the current study, results showed no significant difference in fertility-related quality of life scales between women undergoing infertility treatment and women who conceived after infertility treatment. Çavuşoğlu also found that because of the long-term effects of being infertile, it is understandable to have low quality of life even after getting pregnant.

While it is common knowledge that for everyone the best thing for health is to have a healthy lifestyle, However, having healthy lifestyle behaviors is more even more important for women who want to have a baby or are in pregnancy process (Coşkun, 2012; Dereli Yılmaz & Kızılkaya Beji, 2010). Kaya et al., (2016) stated that healthy lifestyle behaviors have a great impact on the fertilization system and getting pregnant. Unfortunately, if women have more poor food choices, consume tobacco and/or alcohol, engage in no exercise, and are socially isolated from the environment; the effectiveness of infertility treatment or naturally pregnancy decreases (Demir & Kızılkaya Beji, 2016; Kaya et al., 2016). In this study, I used a scale which has six dimensions of healthy lifestyle behaviors: nutrition, self-fulfillment, interpersonal relationships, stress management, physical activity, and health responsibilities.

Results of this study showed that both women undergoing infertility treatment and women who conceived after infertility treatment had similar levels of healthy lifestyle behaviors. Another finding is that women undergoing infertility treatment had higher nutritional healthy lifestyle

behaviors than women who conceived after infertility treatment. This can be interpreted as it is a necessity to educate both women undergoing infertility treatment and conceived after infertility treatment about the healthy lifestyle behaviors and their effect on treatment process, pregnancy, and baby during pregnancy and after pregnancy. Education might include the six dimensions of healthy lifestyle behaviors nutrition, self-fulfillment, interpersonal relationships, stress management, physical activity, and health responsibilities. Also, an educator can give the Healthy Lifestyle Behaviors Scale at the beginning and end of the education to help those women to see their changed knowledge and behaviors.

In conclusion, it can be said from this study's results that women undergoing infertility treatment and women who conceived after infertility treatment have similar levels of social anxiety, avoidance, quality of life, and healthy lifestyle behaviors. Therefore, it can be summarized that conceived infertility treatment does not cause significant levels of change on women's anxiety, quality of life, and healthy lifestyle behaviors. Even after successful infertility treatment, women still have anxiety, fear, low quality of life, and healthy lifestyle behaviors. The only differences are on having higher level of social anxiety and avoidance and higher knowledge of nutritive healthy lifestyle behaviors during infertility treatment.

Limitations of the Study

There were some limitations that might negatively impact the current study. First , all measurements were self-reported which leads to the possibility that participants may not answer honestly, provide exaggerated answers, or just provide an answer without reading specific items (Pannucci & Wilkins, 2010). Second, uncompleted survey packages were all excluded from the study to provide the balance of the answers from all. Third, even though survey packages had no identifiable names, personal information was taken, therefore, there might still be subject to socially desirability which may impact on participants answers. Another limitation might be the close-ended, circled, or Likert type scales question types. It would be interesting to have additional open-ended questions to better understand participants responses and increase awareness of specific

sociocultural effects about being in fertility treatment. As Bernard (2011) says, although a quantitative study provides statistical data on the infertility treatment process of the women, it still provides limited information and a few encouragements to have change without an experimental design.

Recommendations

The findings suggest that even being in the infertility treatment process or conceiving after treatment doesn't have a significant change on anxiety and fear at social environment, fertility-related quality of life, and healthy lifestyle behaviors. The only difference found was that women undergoing infertility treatment have higher social anxiety and fear and nutritive healthy lifestyle behaviors than women who conceived after infertility treatment. Therefore, it is recommended that future studies can be done to help those women to be aware of the emotional, psychological, and physical changes during infertility treatment and pregnancy. Also, future studies can examine the ways to help and support those women to overcome these two processes (infertility treatment and pregnancy) in more healthy ways and increase the quality of life and healthy lifestyle behaviors.

Mental health professionals and nurses might develop training programs, workshops, or education about getting support from the social environment and to develop effective coping strategies to increase encouragement and adaptation to treatment and the pregnancy process. Also, they might include necessity and emergency information during infertility treatment and pregnancy to help them to understand when to tolerate when to call doctors or go to the hospital. The other significant part of the programs might be helping women to define and overcome social and cultural meanings, beliefs, norms, and expectations of being infertile and pregnant specific to Turkish culture.

According to the Greil et al., (2010), the difference between developing and developed countries is the accepted approach to the voluntary childlessness which takes out the social pressure of developing countries to have a baby. Voluntarily childless women had less perceived social pressure and fewer levels of psychological difficulties than involuntarily childless women (Calhoun

& Selby, 1980). Undergoing infertility treatment has negative psychological impacts on couples' life. Also, several studies showed that couples have decreased psychological well-being, increased anxiety, depression, low quality of life, marital relationship and sexual problems (Kızılkaya Beji, & Kaya, 2017; Luk & Loke, 2015; Güleç et al., 2011). With the increased age, education level of a spouse, duration of the marriage, having a child and being pregnant before, duration and number of infertility treatment are factors increase negative psychological impacts on couple's life (Atay, 2017). Also, it is known that infertility-related stress has a more negative impact on marital satisfaction than emotional stress (Gana & Jakubowska, 2014). This may be caused by the personal, social, and cultural meanings of being infertile. In order to overcome social anxiety and get rid of negative social contributions of infertility, education programs can be helpful with including society specific religious beliefs and grounded traditions (Rouchou, 2013).

Qualitative research could be designed to provide an in-depth examination of the cultural meanings and blockages about being infertile and getting pregnant with infertility treatment from the perspectives of women undergoing infertility treatment and conceived after infertility treatment. This kind of study might provide more comprehensive evidence as to why those women undergoing infertility treatment had higher social anxiety and avoidance than those women who conceived after infertility treatment. In addition, pre and post-experimental design research could also be conducted wherein the women undergoing infertility treatment and conceived after infertility treatment could get a training about identifying and changing sociocultural meaning of infertility, healthy coping strategies to overcome social anxiety and avoidance, ways to have a high fertility related quality of life, and healthy lifestyle behaviors.

Implications

The study's findings have added to the limited scientific knowledge about the social anxiety and avoidance, fertility-related quality of life, and healthy lifestyle behaviors of the women undergoing infertility treatment and women conceived after infertility treatment. The study's findings suggest that women undergoing infertility treatment have higher social anxiety and

avoidance than women who conceived after infertility treatment. Also,the finding indicate that there is no difference in fertility-related quality of life between the two groups which means both have need to develop factors related to quality of life. The only difference in healthy lifestyle behavior is that women undergoing infertility treatment have a higher level of nutritive healthy lifestyle behaviors than women who conceived after infertility treatment. Actually, some of that information has supported the findings from other studies and some are new, especially with the Turkish population. Findings regarding the social anxiety and avoidance level of women undergoing infertility treatment provide enhanced knowledge of psychosocial effects on infertility diagnosis and treatment which might be future research topic to develop psychoeducational programs or workshops to aware and overcome psychosocial effects of infertility diagnosis. This might be significant to overcome because women with high social anxiety and avoidance might have difficulty to develop the quality of life and healthy lifestyle behaviors. Healthy lifestyle behaviors include nutrition, self-fulfillment, interpersonal relationships, stress management, physical activity, and health responsibilities; but without going out or assertive for personal needs, women might have difficulty to go to shopping, calling friends, daily sports, overcoming distorted thoughts, or having a healthy relationship with the social environment. Without these essential healthy lifestyle behaviors, those women might have difficulty to develop high quality of life. In addition, one of the current study's findings was that women undergoing infertility treatment have higher nutritive healthy lifestyle behaviors than women conceived after infertility treatment. There might be a misunderstanding or lack of knowledge that might lead women not to consider about nutritive behaviors after getting pregnancy which is a risk factor and harm for babies and pregnant mothers. So this finding might be considered by reproductive health care team too to inform even the conceived mothers about the significance of the nutrition during the pregnancy process.

Another long term positive social change effect might be about the increase on the getting pregnant after infertility treatment and having a birth of healthy babies after getting trained about the psychosocial effects and overcoming ways, ways to increase fertility related quality of life and

healthy lifestyle behaviors during infertility treatment and pregnancy. The results of this study provide information for gynecologists, reproductive health care providers, psychologists, sociologists, and dietitians about the psychosocial status and necessities in those women's daily life to be aware, change, or follow. Lastly, with the advanced knowledge and promoted cultural awareness after this study, professionals might consider more culturally sensitive screening, and programs to better educate women on social, mental, and physical healthy fertility process.

Conclusion

Due to the increasing ratio of women who have difficulty getting pregnant, this study attempted to clarify and add knowledge to the science about the social anxiety, fertility-related quality of life, and healthy lifestyle behaviors of the Turkish women undergoing infertility treatment and women who conceived after infertility treatment. Through the use of a nonexperimental quantitative comparative research design, women undergoing infertility treatment and women conceived after infertility treatment completed the survey package including demographic questionnaire, Liebowitz Social Anxiety Scale, Fertility Quality of Life Questionnaire, and Healthy Lifestyle Behavior Scales. The social support and stress buffering theory served as the current study's theoretical foundation and the health promotion model served as the conceptual framework. Using Mann-Whitney U tests, results showed that women undergoing infertility treatment have a higher level of social anxiety and avoidance than women conceived after infertility treatment; no significant difference in fertility quality of life on both women undergoing infertility treatment and conceived after infertility treatment; women undergoing infertility treatment have higher healthy lifestyle behaviors on nutrition than women conceived after infertility treatment. Findings about the high level of social anxiety and avoidance of women undergoing infertility treatment was consistent with Yılmaz and Oskay (2017) and Gokler et al., (2014) that infertile Turkish women use active-avoidance, active-confronting, and passive avoidance coping methods, using self-imposed isolation coping strategies which might be the reason for having a high level of loneliness. The current study enhanced knowledge about specific situations of feeling social anxiety and avoidance which might

help other researchers to work on specific situations to help those women overcome anxiety and avoidance. Finding the non-different level of fertility quality of life was consistent with Çavuşoğlu (2015) conclusion that getting pregnant after infertility treatment is not sufficient to overcome infertility related quality of life issues. The other significant finding of a high level of a healthy lifestyle on nutrition during infertility treatment is a unique finding because there is no study in the literature that shows a difference on healthy lifestyle behaviors between women undergoing infertility treatment and women who conceived after infertility treatment.

This research study filled a gap in the existing literature by examining social anxiety, quality of life, and healthy lifestyle behaviors of women with infertility with women who conceived after infertility treatment. It is a unique study because of investigating infertility related social anxiety, quality of life, and lifestyle behaviors of infertile women, comparing those scores with women who conceived after infertility treatment using social anxiety, fertility specific scale of quality of life, and healthy lifestyle behaviors surveys. There was also no study in the literature about the social anxiety of women undergoing infertility treatment and women who conceived after infertility treatment and also compared with the quality of life, and healthy lifestyle behaviors levels. Continued research in this area is needed because it may provide enhanced knowledge of the psychosocial obstacles and needs of women undergoing infertility treatment and conceived after infertility treatment. Also, preparing studies to see the effect of short term and long-term impact of psychoeducational programs on those women about the psychosocial obstacles and needs during and after infertility treatment may lead to better health care and fertility treatment outcome for the women undergoing infertility treatment and conceived after infertility treatment.

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Appendix A: Letter to the Fertility Clinics

My name is Esra Savaş and I am a Doctoral student in Clinical Psychology at Walden University. I am writing to ask your help in recruiting participants for a research study that I am conducting related to infertility and infertility treatment. The purpose of this study is to gain a greater understanding of infertility and treatment on social anxiety, quality of life, and healthy lifestyle behaviors in women undergoing infertility treatment and women conceived after infertility treatment. I am conducting this study as a dissertation for my Doctoral degree at Walden University.

I am interested in recruiting women who:

1. Are under infertility treatment or conceived after infertility treatment
2. Married
3. Understands spoken and written Turkish
4. Are 18 years of age or older

I would like to recruit women who meet the criteria above and who are willing to participate in a research study. Participants will be asked to complete three surveys and a demographic questıonnaıre. In total, these surveys should take about 30 minutes to complete. The confidentiality of the participants will be protected throughout the study. I would like to put a box next to the secretary and I will give the survey package to the accepted patients and after completing they can put the package into the box.

I am enclosing a copy of the recruitment flyer for this study. I would like to speak wıth you about thıs research when you are avaılable. Please feel free to contact with me, Esra Savaş at … or at ….

Sincerely,

Esra Savaş

Doctorate Candidate in Clinical Psychology Walden University

Appendix B: Participation Flyer

YOU ARE İNVITED

If you are receiving infertility treatment or got pregnant after infertility treatment

At least 18 years of age

Married

Understand spoken and written Turkish

Research will take 30 minutes to complete

All personal information is confidential

If you meet the qualifications and like to participate this study please contact me at … or email …

"Would you be willing to participate in a research study examining the social, quality of life, and life style behaviors during and after infertility treatment? If you choose to take part in the study, you will be asked to sign a consent form and to complete a study packet containing three surveys and one demographic form. The questionnaires ask about your feelings and your experiences during infertility process. The questionnaire packet should take approximately 30 minutes to complete. The questionnaire packet is assigned with a number without personal specific information and your responses will not be given to your physician or anyone else. Your participation is voluntary and will not affect your medical treatment if you refuse."

Appendix C: Informed Consent

Since the consent form is part of the IRB application and contains identifying information, I removed consent form from the dissertation. (https://academicguides.waldenu.edu/formandstyle/intro/confidentiality).

Appendix D: Demographic Form

1. Your age: (1)18-25 (2)26-35 (3)36-45
2. Education level: 1- Literate 2- Primary School 3- High school 4- University/Master Degree
3. Marital Status:1- Married 2- Single 3- Widowed 4- Divorced
4. Total years of your marriage:…..
5. Who are you living at home with: (1) Core family (2) Husband's family (3) My family

6. Working Status: 1-Not working 2- Never worked 3-Working 4-Searching job

7. Economical Status: 1- Low (Income is lower than outcome)
2- Medium (Income is equal to outcome)
3-Good (Income is more than outcome)
4-Very good (Income is too much more than outcome)

8. how frequently do you attend religious services? 1- never 2- few 3- do requirements 4- often 5- too often

9. Pregnancy Number?..... Birth Number.....

10. Did you ever experience baby loss during pregnancy? (1)Evet (2)Hayır

11. If yes, how many times..... 12. If yes, the reason.....

13. Do you have any physical or chronic disease?
1- No 2- yes 14. If yes, what is it?……

15. How do you evaluate your social support system?: 1- Not sufficient 2-Sufficient
Below items are for women undergoing infertility treatment process (16, 17, and 18. items)

16. How long do you want to have a children?

(1) Less than 1 year (2) 1-2 years (3) 3-5 years (4) 6-10 years (5) 11 years and more

17. How many years have you been getting infertility treatment?

(1) Less than 1 year (2) 1-2 years (3) 3-5 years (4) 6-10 years (5) 11 years and more

18. What is the reason of infertility problem? 1. Women related 2. Men Related 3. Women and men related 4. Not reasonable infertility

Below items are for women conceieved after infertility treatemnt (16a, 17a,18a, and 19a items)
16(a). How long did you want to have a children?

(1) Less than 1 year (2) 1-2 years (3) 3-5 years (4) 6-10 years (5) 11 years and more

17(a). After how many infertility treatment conceived as pregnant?

(1)1 (2)1-3 (3)3-5 (4)6-10 (5)11 and more

18(a)What is the reason of infertility problem?

1. Women related 2. Men Related 3. Women and men related 4. Not reasonable infertility

Appendix E: Liebowitz Social Anxiety Scale

Liebowitz Social Anxiety Scale Liebowitz MR. Social Phobia. Mod Probl Pharmacopsychiatry 1987;22:141-173

Pt Name:		Pt ID #:
Date:	Clinic #:	Assessment point:

Fear or Anxiety:
0 = None
1 = Mild
2 = Moderate
3 = Severe

Avoidance:
0 = Never (0%)
1 = Occasionally (1—33%)
2 = Often (33—67%)
3 = Usually (67—100%)

	Fear or Anxiety	Avoidance	
1. Telephoning in public. (P)			1.
2. Participating in small groups. (P)			2.
3. Eating in public places. (P)			3.
4. Drinking with others in public places. (P)			4.
5. Talking to people in authority. (S)			5.
6. Acting, performing or giving a talk in front of an audience. (P)			6.
7. Going to a party. (S)			7.
8. Working while being observed. (P)			8.
9. Writing while being observed. (P)			9.
10. Calling someone you don't know very well. (S)			10.
11. Talking with people you don't know very well. (S)			11.
12. Meeting strangers. (S)			12.
13. Urinating in a public bathroom. (P)			13.
14. Entering a room when others are already seated. (P)			14.
15. Being the center of attention. (S)			*15.*
16. Speaking up at a meeting. (P)			16.
17. Taking a test. (P)			17.
18. Expressing a disagreement or disapproval to people you don't know very well. (S)			18.
19. Looking at people you don't know very well in the eyes. (S)			19.
20. Giving a report to a group. (P)			20.
21. Trying to pick up someone. (P)			21.
22. Returning goods to a store. (S)			22.
23. Giving a party. (S)			23.
24. Resisting a high pressure salesperson. (S)			24.

Appendix F: Fertility Quality of Life Scale

FertiQoL International

Fertility Quality of Life Questionnaire (2008)

For each question, kindly check (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 (*) only if you have a partner.

	For each question, check the response that is closest to your current thoughts and feelings	Very Poor	Poor	Neither Good nor Poor	Good	Very Good
A	How would you rate your health?	☐	☐	☐	☐	☐
	For each question, check the response that is closest to your current thoughts and feelings	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied
B	Are you satisfied with your quality of life?	☐	☐	☐	☐	☐
	For each question, check the response that is closest to your current thoughts and feelings	Completely	A Great Deal	Moderately	Not Much	Not At All
Q1	Are your attention and concentration impaired by thoughts of infertility?	☐	☐	☐	☐	☐
Q2	Do you think you cannot move ahead with other life goals and plans because of fertility problems?	☐	☐	☐	☐	☐
Q3	Do you feel drained or worn out because of fertility problems?	☐	☐	☐	☐	☐
Q4	Do you feel able to cope with your fertility problems?	☐	☐	☐	☐	☐
	For each question, check the response that is closest to your current thoughts and feelings	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied
Q5	Are you satisfied with the support you receive from friends with regard to your fertility problems?	☐	☐	☐	☐	☐
*Q6	Are you satisfied with your sexual relationship even though you have fertility problems?	☐	☐	☐	☐	☐
	For each question, check the response that is closest to your current thoughts and feelings	Always	Very Often	Quite Often	Seldom	Never
Q7	Do your fertility problems cause feelings of jealousy and resentment?	☐	☐	☐	☐	☐
Q8	Do you experience grief and/or feelings of loss about not being able to have a child (or more children)?	☐	☐	☐	☐	☐
Q9	Do you fluctuate between hope and despair because of fertility problems?	☐	☐	☐	☐	☐
Q10	Are you socially isolated because of fertility problems?	☐	☐	☐	☐	☐
*Q11	Are you and your partner affectionate with each other even though you have fertility problems?	☐	☐	☐	☐	☐
Q12	Do your fertility problems interfere with your day-to-day work or obligations?	☐	☐	☐	☐	☐
Q13	Do you feel uncomfortable attending social situations like holidays and celebrations because of your fertility problems?	☐	☐	☐	☐	☐
Q14	Do you feel your family can understand what you are going through?	☐	☐	☐	☐	☐
	For each question, check the response that is closest to your current thoughts and feelings	An Extreme Amount	Very Much	A Moderate Amount	A Little	Not At All
*Q15	Have fertility problems strengthened your commitment to your partner?	☐	☐	☐	☐	☐
Q16	Do you feel sad and depressed about your fertility problems?	☐	☐	☐	☐	☐
Q17	Do your fertility problems make you inferior to people with children?	☐	☐	☐	☐	☐
Q18	Are you bothered by fatigue because of fertility problems?	☐	☐	☐	☐	☐
*Q19	Have fertility problems had a negative impact on your relationship with your partner?	☐	☐	☐	☐	☐
*Q20	Do you find it difficult to talk to your partner about your feelings related to infertility?	☐	☐	☐	☐	☐
*Q21	Are you content with your relationship even though you have fertility problems?	☐	☐	☐	☐	☐
Q22	Do you feel social pressure on you to have (or have more) children?	☐	☐	☐	☐	☐
Q23	Do your fertility problems make you angry?	☐	☐	☐	☐	☐
Q24	Do you feel pain and physical discomfort because of your fertility problems?	☐	☐	☐	☐	☐

Appendix G: Healthy Lifestyle Behaviors Scale-II

LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, **S** for sometimes, **O** for often, or **R** for routinely

		NEVER	SOMETIMES	OFTEN	ROUTINELY
1.	Discuss my problems and concerns with people close to me.	N	S	O	R
2.	Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
3.	Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
4.	Follow a planned exercise program.	N	S	O	R
5.	Get enough sleep.	N	S	O	R
6.	Feel I am growing and changing in positive ways.	**N**	S	O	R
7.	Praise other people easily for their achievements.	N	S	O	R
8.	Limit use of sugars and food containing sugar (sweets).	N	S	O	R
9.	Read or watch TV programs about improving health.	N	S	O	R
10.	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O	R
11.	Take some time for relaxation each day.	N	S	O	R
12.	Believe that my life has purpose.	N	S	O	R
13.	Maintain meaningful and fulfilling relationships with others.	N	S	O	R
14.	Eat 6-11 servings of bread, cereal, rice and pasta each day.	N	S	O	R
15.	Question health professionals in order to understand their instructions.	N	S	O	R
16.	Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	N	S	O	R
17.	Accept those things in my life which I can not change.	N	S	O	R
18.	Look forward to the future.	N	S	O	R
19.	Spend time with close friends.	N	S	O	R
20.	Eat 2-4 servings of fruit each day.	N	S	O	R
21.	Get a second opinion when I question my health care provider's advice.	N	S	O	R
22.	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	N	S	O	R
23.	Concentrate on pleasant thoughts at bedtime.	N	S	O	R
24.	Feel content and at peace with myself.	N	S	O	R
25.	Find it easy to show concern, love and warmth to others.	N	S	O	R

	NEVER	SOMETIMES	OFTEN	ROUTINELY
26. Eat 3-5 servings of vegetables each day.	N	S	O	R
27. Discuss my health concerns with health professionals.	N	S	O	R
28. Do stretching exercises at least 3 times per week.	N	S	O	R
29. Use specific methods to control my stress.	N	S	O	R
30. Work toward long-term goals in my life.	N	S	O	R
31. Touch and am touched by people I care about.	N	S	O	R
32. Eat 2-3 servings of milk, yogurt or cheese each day.	N	S	O	R
33. Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O	R
35. Balance time between work and play.	N	S	O	R
36. Find each day interesting and challenging.	N	S	O	R
37. Find ways to meet my needs for intimacy.	N	S	O	R
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O	R
39. Ask for information from health professionals about how to take good care of myself.	N	S	O	R
40. Check my pulse rate when exercising.	N	S	O	R
41. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O	R
42. Am aware of what is important to me in life.	N	S	O	R
43. Get support from a network of caring people.	N	S	O	R
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45. Attend educational programs on personal health care.	N	S	O	R
46. Reach my target heart rate when exercising.	N	S	O	R
47. Pace myself to prevent tiredness.	N	S	O	R
48. Feel connected with some force greater than myself.	N	S	O	R
49. Settle conflicts with others through discussion and compromise.	N	S	O	R
50. Eat breakfast.	N	S	O	R
51. Seek guidance or counseling when necessary.	N	S	O	R
52. Expose myself to new experiences and challenges.	N	S	O	R

Appendix H: Public Permission to Use and Download The FertiQol Survey

Download FertiQoL

Before downloading any FertiQoL PDF's please read the following terms and conditions of use.

1. You must use FertiQoL as it is without making any changes to the items, order of items, instructions or response scales. PLEASE DO NOT DO YOUR OWN TRANSLATION. We have a translation procedure in place. If you detect an error or a problem, or want a translation into another language or to give us some feedback then email us at fertiqol@cardiff.ac.uk.

2. FertiQoL is free to use but you must acknowledge the sponsors in any publication. Please cite either of the following two publications if you intend to use FertiQoL:

Boivin, J, Takefman, J, Braverman, A. (2011). Development and preliminary validation of the Fertility Quality of Life (FertiQoL) tool. *Human Reproduction, 26*(8), 2084–2091. [pdf]

Boivin, Takefman & Braverman. (2011) The Fertility Quality of Life (FertiQoL) tool: development and general psychometric properties.*Fertility and Sterility, 96*, 409-15. [pdf]

3. Please do not distribute FertiQoL to other researchers or clinicians for their use. Please ask them to visit this website.

4. If you are doing research then at the end of your project we would be grateful if you could send us the sample size for your project, and means and standard deviations for each FertiQoL subscale for our monitoring purposes via email at fertiqol@cardiff.ac.uk.

Languages available

Click on the language to access the required FertiQoL pdf

Appendix I: Thank You Letter

Thank you for attending my study. If you want to get the results, you can send me an email (pskesrasavas@gmail.com).

There is a list of psychological support resources above. If you ever feel you need psychological support, you can get contact with those professionals.

Again I would like to thank you for your support with participating my study

Esra Savaş, M.A.

PhD Candidate

pskesrasavas@gmail.com

Appendix J: List of Psychological Support Resources

İstanbul Metropolitan Municipality Psychological Counseling Ministration/ 153

Gaziosmanpaşa Municipality- Family Counseling Center +90 212 581 87 87

Beşiktaş Municipality- Family Counseling Center 444 44 55

Ümraniye Municipality- Psychological Counseling Center 0216 443 5600

Avcılar Municipality- Psychological Counseling Center 444 6 989 – 3706

Küçükçekmece Municipality- Family and Psychological Counseling Center: 0212 411 08 39

Bağcılar Municipality- Psychological Counseling Center 0(212) 410 06 00

Üsküdar Municipality- Psychological Counseling Center 444 0 875

Maltepe Municipality- Psychological Counseling Center 0216 458 99 99

Esenler Municipality- Psychological Counseling Center 444 00 73

Fatih Municipality- Psychological Counseling Center 0212 521 53 53

Arnavutköy Municipality- Psychological Counseling Center 0 212 681 05 91

Beylikdüzü Municipality- Psychological Counseling Center 444 0 939

Pendik Municipality- Psychological Counseling Center 444 81 80

Ataşehir Municipality- Psychological Counseling Center (0216) 570 50 00

Kadıköy Municipality- Psychological Counseling Center (0216) 363 43 81

Çekmeköy Municipality- Psychological Counseling Center 0542 272 50 04

Zeytinburnu Municipality- Psychological Counseling Center 444 19 84

Eyüp Sultan Municipality- Psychological Counseling Center 0212 615 11 90

Bayrampaşa Municipality- Psychological Counseling Center 0(212) 467 19 00

Beykoz Municipality- Psychological Counseling Center 444 66 61 (8225-8262)

Beyoğlu Municipality- Psychological Counseling Center 0 212 238 11 44

Büyükçekmece Municipality- Psychological Counseling Center 0212 863 30 42

Kartal Municipality- Psychological Counseling Center (0216) 280 64 06

Sancaktepe Municipality- Psychological Counseling Center 622 33 33

Silivri Municipality- Psychological Counseling Center 444 20 47

Sultangazi Municipality- Psychological Counseling Center 444 23 32

Tuzla Municipality- Psychological Counseling Center 0216 395 98 18

Esenyurt Municipality- Psychological Counseling Center 444 0 411

Kağıthane Municipality- Psychological Counseling Center 444 23 00

Sarıyer Municipality- Psychological Counseling Center (212) 299 81 59

Sultanbeyli Municipality- Psychological Counseling Center 0216 564 13 00

Appendix K: Permission to Using Healthy Lifestyle Beahviors Scale-II

Zuhal Bahar <zbahar@ku.edu.tr> şunları yazdı (14 Mar 2018 10:44):

In english: (Dear SavasKaplan, you can use the scale in your studies, good luck, best loves,)

2018-03-14 3:38 GMT+03:00 Klinik Psikolog Esra <esrasavaskaplan@gmail.com>:

In English: I am Esra Savas, writing my dissertation at Walden University clinical psychology program. My dissertation is also including infertile women's healthy lifestyle behaviors. If you give permission, I would like to use the scale that you and your friends worked on valid and reliability measurement of the Healthy Lifestyle Behaviors Scale-II. I will wait to see your permission mail before I start to use it.

Thank you from now for having time for me.

Yours sincerly,

Appendix L: Permission to Using Liebowitz Social Anxiety Scale

Tülin Gençöz <tgencoz@metu.edu.tr> şunları yazdı (22 Mar 2018 22:01):

Hello, you can use the scale in your scientific studies. I attached the scale and article to the e-mail. Good luck

-----Original Message-----

From: Klinik Psikolog Esra <esrasavaskaplan@gmail.com>

Sent: Wednesday, March 21, 2018 5:20 AM

To: tgencoz@metu.edu.tr

Subject: Liebowitz Sosyal Kaygı Ölçeği

Hello Dr Tulin Gencoz,

I am Esra Savas, writing my dissertation at Walden University clinical psychology program. My dissertation is also including infertile women's healthy lifestyle behaviors. If you give permission, I would like to use the scale that you and your friends worked on valid and reliability measurement of the Liebowitz Social Anxiety Scale. I will wait to see your permission mail before I start to use it.

Thank you from now for having time for me.

Yours sincerly,

<LIEBOWITZ SOCIAL ANXIETY SCALE.pdf><Liebowitz Social Anxiety Scale.docx>