Original Article

Predicting the Quality of Life in Infertile Women Based on Alexithymia and Spiritual health with The Mediating Role of Loneliness

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Abstract

Background and Aim: Infertility is defined as the absence of pregnancy after one year of adequate and regular intercourse. It is both an individual and social problem that can expose individuals to various psychological and social pressures. The present study was an attempt to predict health-related quality of life in infertile women based on mood and spiritual health and considering the mediating role of feelings of loneliness.

Materials and Methods: The study followed a descriptive (non-experimental) method with correlation and structural equations design. Participants were 348 infertile women in the age range of 18-43 years living in Tehran who referred to the infertility clinics and centers in Tehran during 2020. Research tools included standard questionnaires and scales delving into the quality of life, alexithymia, social and emotional loneliness, and spiritual health of the participants of the study. Data analysis was performed using SmartPLS software.

Results: The intensity of the effect of alexithymia on health-related quality of life mediated by loneliness was 0.0962 and the intensity of the effect of spiritual health on health-related quality of life mediated by loneliness was 0.1602. Results also showed that the role of loneliness was partial mediation in the sense that mood and spiritual health involved both directly and indirectly, through the feeling of loneliness, in health-related quality of life in infertile women.

Conclusion: It can be concluded that alexithymia and spiritual health are the most important predictors of health-related quality of life in women with infertility and the mediating role of loneliness in this relationship signified the importance of this practical concept.

Keywords: Health-related quality of life, Women, Infertility, Alexithymia, Spiritual health, Loneliness

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Introduction

In many cultures, childbearing is considered as a family function and accordingly, infertility is considered as an unpleasant shortcoming. Infertility is one of the causes of chronic stress that can result in many psychological problems. Studies show that about 15% of couples experience infertility stress (1). It is estimated that 1 in 10 couples develop primary or secondary infertility. Infertility causes numerous problems in mental health, public well-being, self-esteem, and marital relationships (2). Studies have shown a significant relationship between quality of life and spiritual health in infertile women are the effect of spiritual health as a factor for coping with problems.

Quality of life is people's perception of their position in life in terms of culture, the value system in which they live, their goals, expectations, standards, and priorities. Therefore, it is a completely subjective matter not visible to others, which is based on people's understanding of different aspects of life (3). Quality of life is a feeling of well-being resulting from satisfaction or dissatisfaction with various aspects of life that are important to the person (4). An important dimension of the quality of life is health-related quality of life, which has sparked several studies on various populations (5).

Another important factor affecting the quality of life of infertile women is their spiritual health (6). Spiritual health is one of the four dimensions of health in humans besides the physical, mental, and social dimensions, which promotes general health, coordinates other dimensions of health, and increases the capacity for adaptation and mental function (7). Spiritual health includes both religious and existential dimensions. Religious health refers to satisfaction resulting from a relationship with a higher power while existential health refers to the effort to understand the meaning and purpose of life (8). Studies suggest that spirituality as a coping strategy can improve the quality of life (9). In a society where people have rich and long-held beliefs, paying attention to spirituality seems to be an easier and more desirable way to take humane and multidimensional care (10).

If fertility is not possible after a period of marriage, the view of the wife, the husband, and even those around the couple will change, resulting in emotional rupture and demotivation of the wife in both the family and society, which can even lead to separation and divorce. Infertile women often keep the problem secret from their family, husband, and friends, hoping to find a way out of the problem, which again forms a vicious cycle of anxiety and emotionality in the family and they may use inefficient and crisis-making solutions (11). That is why these people also experience loneliness. This feeling is not only the result of living alone, but also occurs in the absence of quality social communication (12). Alexithymia is a multifaceted construct consisting of (1) difficulty in identifying emotions and distinguishing between emotions and physical agitation related to emotional arousal, (2) difficulty in describing emotions (3) the power of limited visualization, which is determined by fantasies, and (4) objective cognitive style or extraneous and objective thinking (13). Lacking in emotional capacity that leads to failures in diagnosis, description, and identification of emotions and speech, makes these people have difficulty in self-regulation, recognition, detection, and processing of their emotions. Also, they may have problems in distinguishing internal emotions from their physical emotions (14). The literature on controlling alexithymia mainly suggests interventions for regulations such as implementation of cognitive and emotional regulation skills (15, 16).

Research has shown that the study of various aspects of infertility, regardless of the socio-cultural context in which the infertile person lives, is an incomplete and useless endeavor as socio-cultural context exerts strong influences on the life of infertile people. Cultural context is very important in shaping the experience of infertility. Therefore, planning to empower infertile women should be based on a deep understanding of the consequences of this phenomenon in any society (17).

Infertility is a multifaceted issue and causes numerous damages in women, affecting their quality of life. Infertile people are reported to feel isolated and devalued in society (18). On the other hand, mean scores of spiritual health and quality of life in fertile women were found to be higher than those in infertile women (6). Moreover, studies on fertile women have

found a significant correlation between physical health and dimensions of spiritual health on one hand and the quality of life on the other (10). However, no study has been carried out on the quality of life in infertile women as affected by their mood, spiritual health, and loneliness. Therefore, this study was an attempt to find if the health-related quality of life in women with infertility can be predicted by their mood and spiritual health and through the mediating role of loneliness.

Methods

The study followed a descriptive (non-experimental) method based on a correlational research design and structural equations. The statistical population consisted of infertile women living in Tehran in the age range of 18-43 years who referred to infertility centers and clinics in Tehran during 2020. The centers and clinics were sampled based on availability criterion and the willingness of the managers to be a part of the study. The minimum sample size (19) was

250 participants and 348 infertile women consented to be part of the study by completing online questionnaires. The criteria for the participants to be included in the study were (1) minimum education of literacy, (2) having at least 1 and at most 20 years of experience living together with a spouse, (3) primary infertility, (4) no diagnosis of psychiatric ailment or history of severe neurological disease such as psychosis recognized by a physician, and (5) being Iranian. Table 1 presents the demographic features of the participants of the study.

Materials

Measurements
Data collection tools in the study were standard questionnaires including Health-Related Quality of Life Questionnaire (Kidscreen-52), Toronto Alexithymia Scale (TAS-20), Spiritual Health Assessment Scale (SHAS), and Social and Emotional Loneliness Scale for Adults (SELSA-S), which are briefly introduced presently.

Table 1: Demographic features of the participants.

Age	Under 20 year olds	13 women (3.7%)
	21-30 year olds	120 women (34.5%)
	31-41 year olds	182 women (52.3%)
	Above 41 year olds	33 women (9.5%)
Age married	Under 20 years old	95 women (27.5%)
	21-25 years old	91 women (91%)
	26-30 years old	120 women (34.5%)
	31-35 years old	49 women (8.3%)
	Above 36 years old	13 women (3.7%)
Duration of marriage	Less than 2 years	29 women (8.3%)
	3-4 years	73 women (21%)
	5-7 years	93 women (26.7%)
	8-10 years	116 women (33.5%)
	11-12 years	29 women (8.3%)
	16-20 years	2 women (0.6%)
	More than 21 years	6 women (1.7%)
Occupation	Housewives	197 women (56.5%)
	Paid work	151 women (43.4%)
Education	Under high school graduates	47 women (13.5%)
	High school diploma	109 women (31.3%)
	University education	192 women (5.52%)

The Health-Related Quality of Life Questionnaire
It was developed by Weber in 1992 to evaluate health policies and in general to assess the state of health in terms of physical and mental condition. It contains 36 items arranged in 8 subscales each consisting of 2 to 10 items. The eight subscales of the questionnaire are physical function, role disorder due to physical health, role disorder due to emotional health, energy/fatigue, emotional well-being, social functioning, and pain and general health. Also, by merging the subscales, two general subscales are formed under the titles of physical health and mental health. Likert scoring in 5 degrees (completely true to completely false) is used in which a lower score indicates a lower quality of life and vice versa.

Toronto Alexithymia Scale (TAS-20)
It was developed by Bagby, Parker, and Tyler in 1994 to assess a person's ability to express emotions. It is a 20-item instrument and includes three subscales, namely difficulty in identifying emotions, difficulty in describing emotions, and objective thinking. The scoring of the questionnaire is based on a 5-point Likert scale, which is measured and evaluated from completely disagree to completely agree. The internal consistency and Cronbach's alpha coefficient of the instruments were reported as 0.72 and 0.76, respectively[20]. In another study, Cronbach's alpha coefficients for total emotional malaise was calculated as 85% and the values for three subscales of difficulty in identifying emotions, difficulty in describing emotions, and objective thinking were 82% 72%, and 75%, respectively, which suggest good internal consistency of the scale.

The Spiritual Health Scale
It was developed by Gore and Sharma in 2014. It consists of 21 items and 3 subscales of self-growth (7 items), self-fulfillment (7 items), and self-realization (7 items), which are used to assess spiritual health. The scale is arranged as a 5-point Likert scale. The test-retest reliability of this instrument was 0.81% and Cronbach's alpha and internal validity were reported as 0.7 and 0.81, respectively.

Social and Emotional Loneliness Scale for Adults (SELSA-S) developed in 2004 by Di Tummasso, Brannen and Best, consists of 14 items and 3 subscales of Social Loneliness (5 items), Family Loneliness (5 items), and Romantic Loneliness (4 items). The

instrument is arranged as a 5-point Likert scale and Cronbach's alpha reliability for Social Loneliness, Family Loneliness, and Romantic Loneliness were found as 0.78, 0.84, and 0.92, respectively.

Although standard tools with already established reliability and validity were used for data collection, these indexes for the questionnaires and scales were also obtained in the study. The validity of the reliability of the questionnaires and scales were checked by submitting them to 15 experts, who confirmed they were valid for the purpose of the study. The reliability of the questionnaires was also determined using Cronbach's alpha coefficient, which resulted in 0.697, 0.663, 0.934, and 0.962 for quality Health-Related Quality of Life Questionnaire, Toronto Alexithymia Scale, Spiritual Health Assessment Scale, and Social and Emotional Loneliness Scale for Adults, respectively. Both descriptive and inferential analyses were carried out in the study using SPSS and Smart PLS software to analyze the data.

Results

The relationships between research variables as analyzed by Smart PLS software resulted in the final model depicted in Fig. (1). Also, the levels of significance of the relationships between the variables are shown in Figure 2.

Considering the indirect effect of alexithymia on health-related quality of life mediated by loneliness, Figure 1 shows that the path coefficient for the relationship between alexithymia and loneliness was 0.341 (standard error rate based on the software outputs = 0.0411) and for the relationship between loneliness and health-related quality of life the path coefficient was equal to 0.282 (standard error rate based on software outputs equaled 0.0571). Therefore, in the participants of the study, the indirect effect of alexithymia on health-related quality of life through feelings of loneliness was 0.096 as calculated below:

$$B_{indirect} = a \times b \rightarrow 0.341 * 0.282 = 0.0962$$

Since the obtained t-value (see below) was outside the range of +/-1.96, it was confirmed that the indirect effect of alexithymia on health-related quality of life was meaningful through the feeling of loneliness. In other words, alexithymia can improve the quality of

health-related life by increasing the feeling of loneliness. On the other hand, the direct effect of alexithymia on health-related quality of life was also confirmed and this suggests that the role of loneliness was partial mediation in the sense that alexithymia both directly and indirectly (through the feeling of loneliness) affected health-related quality of life.

$$t - value$$
$$= \frac{0.341 * 0.282}{\sqrt{0.341^2 * 0.0411^2 + 0.282^2 * 0.0571^2}}$$
$$\rightarrow t - value = 4.505$$

As shown in Fig. (1), the path coefficient for the relationship between spiritual health and loneliness was 0.568 (standard error rate based on software outputs = 0.0411). Also, the path coefficient for the relationship between loneliness and health-related quality of life was 0.282 (standard error rate based on software outputs = 0.0571). Therefore, as calculated below, the indirect effect of spiritual health on health-related quality of life through feelings of loneliness was calculated as 0.0962.

$$B_{indirect} = a \times b \rightarrow 0.341 * 0.282 = 0.0962$$

The significance of the indirect effect of spiritual health on health-related quality of life mediated by loneliness was examined in the study. Since the t-value, as calculated below, was outside the range +/- 1.96, the indirect effect of spiritual health on health-

related quality of life through the feeling of loneliness was significant, confirming the hypothesis of the study. In other words, spiritual health can improve the health-related quality of life by increasing the feeling of loneliness. Given the direct effect of spiritual health on health-related quality of life, the role of loneliness was partial mediation in the sense that spiritual health both directly and indirectly (through the feeling of loneliness) affected health-related quality of life.

$$t - value$$
$$= \frac{0.568 * 0.282}{\sqrt{0.568^2 * 0.0368^2 + 0.282^2 * 0.0571^2}}$$
$$\rightarrow t - value = 6.0706$$

Cronbach's alpha and composite reliability were used to evaluate the reliability of the measurement model. Also, convergent and divergent validity tests were used to evaluate the validity of the measurement model. Results are shown in Table 2.

Given that the obtained values of R^2 for feeling lonely (0.827) and health-related quality of life (0.704) are average, it can be argued that the structural fit of the model by R^2 is moderate. All the fitting indicators used in the study suggest that the model has a good fit. Therefore, it is concluded that the research model has a high capacity to measure the main research variables. Because of the standard nature of the model, the research findings are reliable.
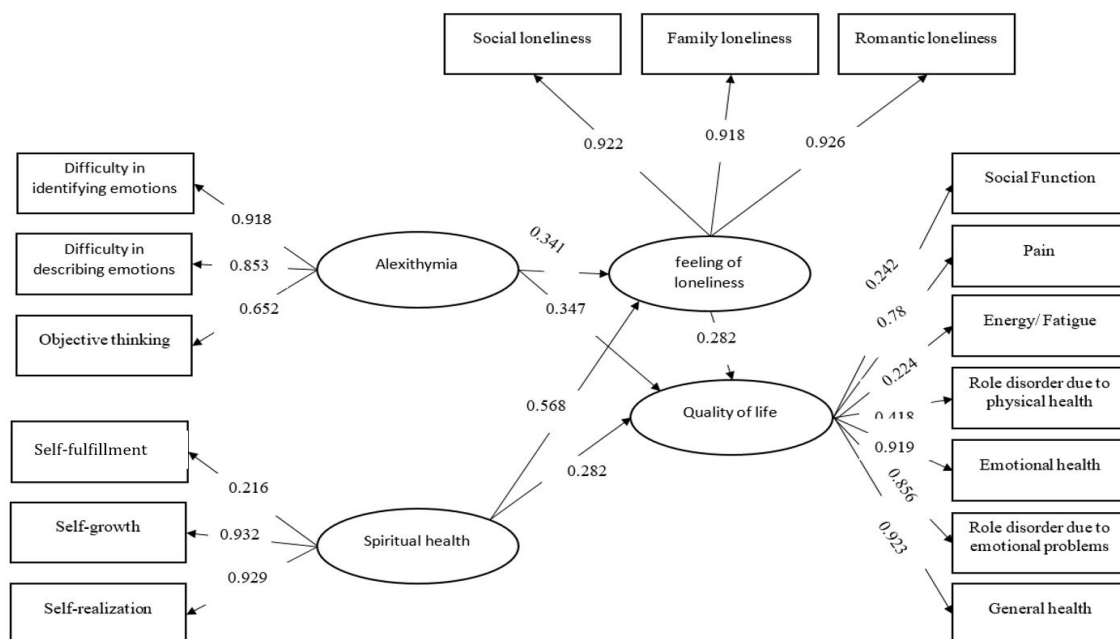

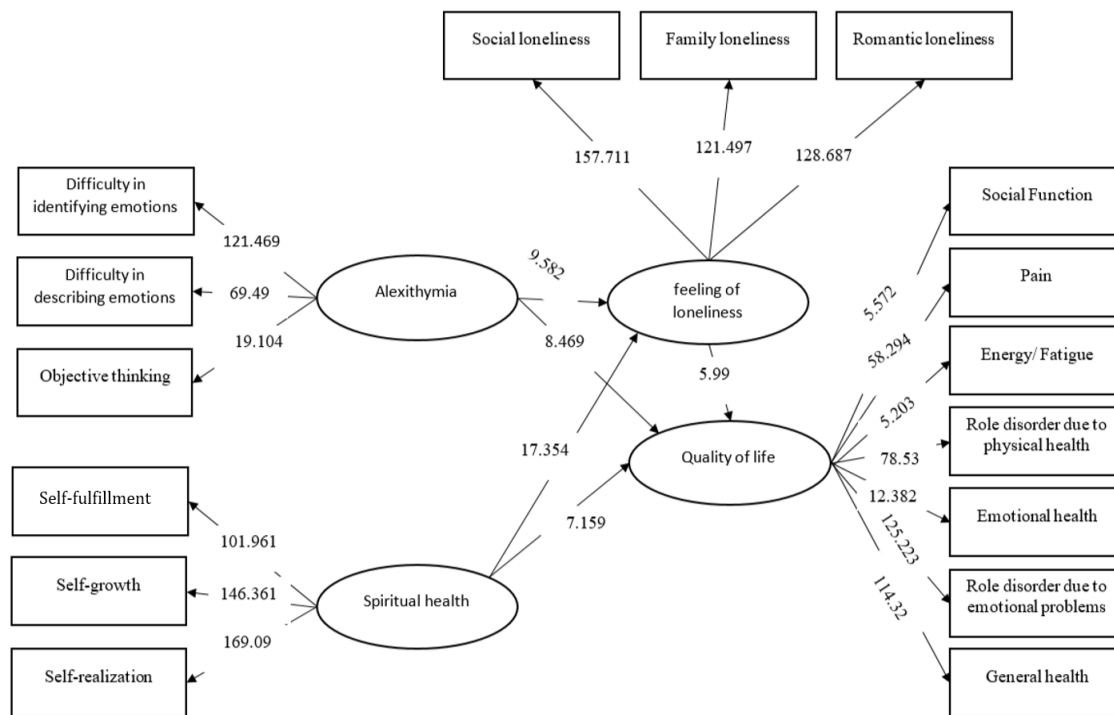**Figure 1.** The final structural model in the standard estimation mode.

Figure 2. The final structural model in the significant mode.

Table 2: Reliability and validity indexes of the model.

Variable	Cronbach's alpha	Composite reliability (Delvin-Goldstein p)	Convergent validity	Variable status
Feeling lonely	0.924	0.952	0.868	Acceptable
Mental health	0.917	0.947	0.857	Acceptable
Quality of life	0.714	0.717	0.479	Acceptable
Alexithymia	0.723	0.655	0.665	Acceptable

GOF criterion is related to the general part of structural equation models. This means that by this criterion, the researcher can control the fit of the general part after examining the fit of the measurement part and the structural part of the general research model. Values of 0.01, 0.25 and 0.35 indicate weak, medium and strong overall fit, respectively. The GOF value in the present research model was obtained as follows:

$$GOF = \sqrt{Communality * \underline{R^2}} = 0.416$$

The obtained GOF of 0.416 suggests an excellent overall fit level of the model.

Discussion

The aim of this study was to investigate and predict health-related quality of life in women with infertility based on alexithymia and spiritual health with respect to the mediating role of feelings of loneliness.

Findings of the study suggest that a fair part of variabilities in health-related quality of life of the infertile women are attributed to alexithymia and spiritual health as mediated by their feelings of loneliness and all these variables have a significant impact on the health-related quality of life of women who experience infertility.

Studies by other researchers have shown the negative impact of infertility on the quality of life of infertile

women (21-22) which is consistent with the findings of present study. Literature on the psycho-emotional impacts of infertility has also associated the condition with low self-esteem and poor marital quality (23), infertility stress (24), feelings of hopelessness in women (25), anxiety and dissatisfaction with life (26), and low sexual function (27). Since infertility is an individual and social problem that can expose people to various levels of psychological and social pressures, it may cause chronic stress and psycho-emotional disorders. For many people, infertility is a major critical and psychological stressor that can cause emotional stress and a range of negative psychological reactions including depression, anxiety, worry, anger, shame, jealousy, loneliness, despair, low self-esteem, emotional imbalance, and sexual dysfunction (28). Adverse social conditions, such as the stigma of inability to conceive and looking unhealthy, isolate infertile people and distance them from the others. They also degrade people's self-esteem and make them unable to cope effectively with infertility stress; therefore, it increases the risk of depression in infertile people. People who are labeled infertile consider themselves different from the others and gradually distance themselves from them. This distance from others, which may be due to the avoidance of recalling their infertility, may lead to their isolation and withdrawal, and these individuals experience a feeling of loneliness that eventually may result in depression and impairment of their quality of life. In times of stress, the need for affection and being loved is pronounced to establish friendship-exchange relations; but, when individuals feel lonely and are socially isolated, their mental health is endangered. Therefore, the quality of life can be considered as one of the signs of measuring health. Quality of life is a state of complete physical, mental, and social well-being, and people who feel highly lonely also have low self-esteem as they experience physical and emotional distress due to infertility. Besides, infertile women are not sure of their capabilities and are vulnerable in emotional and romantic tumults, assuming an introverted personality in interpersonal behaviors, (e.g., embarrassment, shame, anxiety, lack of courage, low risk, etc.) all of which contribute to a low quality of life.

A significant relationship was found in the study between spiritual health and health-related quality of life, which is consistent with the findings of other researchers (29). This suggests that spiritual life an important factor affecting the quality of life of people. Spiritual health is one of the four dimensions of health in humans, along with the physical, mental, and social dimensions which promote general health. This construct includes both religious and existential dimensions. The former refers to the satisfaction resulting from a relationship with a superior power and the latter is concerned with understanding the meaning and purpose of life (5). The search for meaning in life can be considered as an effective way to cope with adversities of life. Even in very frustrating and difficult situations, man can create meaning for himself and according to previous studies, without spiritual health, other biological, psychological, and social dimensions cannot function properly or reach their maximum capacity and therefore, the highest level of quality of life cannot be achieved. Since a disorder in spiritual health can lead to many mental disorders such as depression, hopelessness, and loneliness, paying attention to spirituality, religion, relationship with God, and ultimately spiritual health is a very effective measure to prevent and treat many disorders. In a society where people have rich and long-held beliefs, paying attention to meaning seems to be a more effective and easier way for multidimensional and humanistic care.

Alexithymia is a multifaceted construct characterized by lack of emotional capacity, self-regulation, recognition, revelation, emotion processing. The construct was found to be a significant variable in the regression model of the study, confirming the findings of other researcher (6-10-30-31). A possible explanation for the effect of alexithymia on the quality of life of infertile participants of the study is that the more they try to suppress their emotion, the more they increase their physiological reactivity and experience negative emotion, and instead decrease the experience of positive emotion. Suppression of emotion can also have costly consequences such as feelings of unreality, and people who try to suppress unwanted thoughts experience a reflection of these thoughts to a greater extent than when these unwanted thoughts were expressed.

Findings of the present study revealed an indirect effect

of alexithymia on health-related quality of life through feeling lonely was also significant, (i.e., alexithymia could decrease health-related quality of life by increasing the feeling of loneliness). It is worth noting that the direct effect of alexithymia on health-related quality of life has also been confirmed and the role of the feeling of loneliness was partial mediation in the sense that alexithymia both directly and indirectly (through loneliness) affected the health-related quality of life in infertile people. Studies on infertile women show that infertile they suffer from more severe mental disorders and have more stress than their fertile counterparts (21) and negative reactions such as sadness, anxiety, depression, fear, hostility, isolations, mourning, feeling of sexual and personal inadequacy, threat to self-esteem, and confused sexual activity are seen more in infertile women, which is consistent with the findings of the present study. It was reported that inability to understand one's own feelings and emotions and those of the others, as well as a lack of verbal inability to regulate these emotions and feelings, (i.e., inability to verbally evaluate and express one's emotions reduce the quality of life) (32) and these can directly make people feel lonely or pay more attention to themselves and fear to communicate with the others lest they are ridiculed (33). Emotional distress was found to predict interpersonal problems and social interactions, and that infertile people have a restraining attitude in their social situations, and this inhibition prevents social interactions, leading to isolation and loneliness (34). Infertile women may feel embarrassed, and this eventually could intensify their feeling of loneliness[35] also consistent with our study. Another finding of the study was the role of loneliness as it was found that spiritual health could increase the quality of health-related life by decreasing the feeling of loneliness. It seems that infertile women who suffer from loneliness cannot have an intimate, reliable and empathetic relationship with their partner or husband. People who are vulnerable to loneliness have insufficient social skills and are therefore marginalized. Loneliness was reported as a threat to the quality of life that affects physical and mental health and life satisfaction and is inversely related to spiritual health (36).

Improving quality of life affects a person's level of health, mental status, level of independence, social relationships and other dimensions (37). One of the factors that affect women's quality of life is their fertility status (38). This may be due to the fact that infertility occurs in the family context and has a great impact on family relationships, especially marital relationships. Therefore, the quality of family relations, especially the support received from the spouse, has a significant impact on the mental health of the infertile women (39). On the other hand, lack of family support puts a lot of stress on the infertile women and can have psychological consequences such as feelings of loneliness and make them extremely vulnerable to stress. Family support through not leaving the infertile women alone and understanding their psychological circumstance makes it easier for these people to deal with the problem and accept the situation. This acceptance and understanding by the family reduce negative thoughts and tendencies for isolation and preference to be alone.

Conclusion

Overall, based on the findings of the study, it can be concluded that alexithymia and spiritual health are the most important predictors of health-related quality of life in women with infertility and the mediating role of loneliness in this relationship signified the importance of this practical concept. There were some limitations to the study which need to be considered before making any generalizations about its outcome. The statistical population of the study consisted of infertile women in Tehran and cannot be generalized to other cities. The large number of questions in the questionnaires led to the prolongation of its execution time, which may have negatively affected the accuracy of the participants' answers. Replication of the study with larger sample size and on the general population will help generalize the findings. Finally, special care with psychological counseling is recommended to help couples with infertility, particularly those who experience low quality of life, loneliness, or alexithymia, to cope with this experience.

Acknowledgment

who participated in this study. This article is taken from the doctoral dissertation with research code 18120705971009 and ethics code IR.IAU.QOM.REC.1398.031.

Conflict of Interest

The authors declare that they have no conflict of interest.

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