

The Role of Spirituality in the Psychological Well-being of Infertile Women through the Mediation of Emotion Regulation: A Predictive Correlational Study

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ARTICLE INFO	ABSTRACT
<p><i>Article type:</i> Review article</p>	<p>Background & aim: Infertility is recognized as a distressing life event that may threaten the psychological well-being of women facing infertility, affecting their interpersonal relationships and self-confidence. The present study was conducted to investigate the role of spirituality in the psychological well-being of infertile women through the mediation of emotion regulation among infertile women.</p> <p>Methods: In this predictive correlational study, we surveyed 400 infertile women who referred to infertility clinics in Qom and Isfahan in 2021. We used Spirituality Assessment Inventory (SAI) (1996) by Hall et al., Ryff's short form scale of Psychological well-being, and Gross and John's 10 question Emotion Regulation questionnaire. Date reliability and validity were assessed through Cronbach's alpha, composite reliability, AVE index. Discriminated validity was examined using the Fornell and Lurker matrix, Model analysisR2 for explanatory power, Q2 for predictive relevance, and incidence like SRMR and NFI for fit assessment.</p> <p>Results: Both direct and indirect effects of total spirituality on psychological well-being were statistically significant ($p < 0.01$). Likewise, the direct effect of reappraisal strategy on psychological well-being was significant ($p < 0.01$). Also, the suppression strategy demonstrated a significant indirect effect on psychological well-being ($p < 0.01$). The effects of total spirituality, reappraisal strategy and suppression on psychological well-being were also significant ($p < 0.01$).</p> <p>Conclusion: The results showed that spirituality both independently and through mediation of emotional regulation strategies significantly affect the psychological well-being of infertile women. Notably, the suppression strategy of emotion regulation has a negative effect on their psychological well-being. To enhance, the psychological well-being, of infertile women, it is necessary to provide targeted counseling services with a focus on spirituality is recommended.</p>
<p><i>Article History:</i> Received: 29-Aug-2023 Accepted: 26-Dec-2023</p>	
<p><i>Key words:</i> Infertile Women Psychological Well-being Spirituality Emotion Regulation</p>	

► Please cite this paper as:

Safara M, Haghghi H, Heidari A, Saeedi Z, Jafari doudaran P, Tayarani Rad A. A Predictive Correlational Study. Journal of Midwifery and Reproductive Health. 2025; 13(1): 4611-4621. DOI: 10.22038/JMRH.2023.74664.2193

Introduction

Infertility, as one of the painful events in life, can threaten a person's mental health and affect sexual activity, interpersonal communication and self-confidence (1). Infertile people feel

more depressed, helpless, tired, confused, angry, rejected and lonely (2-3).

Almost a quarter of Iranian couples experience primary infertility during their life (4). Also, due to genetic and hormonal problems, use of some drugs, increasing the age of marriage and

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delaying childbearing, improper nutrition and air pollution, infertility trend has been increased (5).

Infertility can be a life crisis with a wide range of social, psychological, physical and financial problems (6-7). Infertility is recognized worldwide and in all cultures as a stressful and critical experience that threatens individual, marital, family and social stability. The World Health Organization has named infertility as a public health problem worldwide (2). In medicine, if a husband and wife of childbearing age do not conceive 12 months after marriage, despite having normal sexual activity without using contraceptive methods, one of the couples are infertile. Infertility is any type of hormone deficiency or disease that causes a woman or a man to not have children. Today, infertility is defined as the absence of pregnancy after one year of unprotected sexual intercourse (without the use of contraceptive methods) (8). The overall average of infertility in Iran is reported to be 13.2%. Also, several studies in Iran have reported the overall frequency of primary infertility in Iran to be 2.5% and secondary infertility to be 2.3% (9).

According to the study by Simionescu et al. (2021), infertility, as one of the crises of marital life, imposes a lot of stress on infertile couples and can threaten their mental health in different ways and cause disruption in the quality of marital life and decrease intimacy and fear of ending marital relationship, helplessness and sometimes clinical manifestations and other mental disorders (10). Previous research have shown that the stressful experience of infertility is associated with a wide range of psychological harms, including reduced levels of self-esteem, increased levels of stress, tension, anxiety, depression, anger, feelings of inferiority, feelings of inefficiency, sexual dysfunction, and marital problems (11-12).

Psychological well-being refers to people's positive feelings about themselves and their lives, and includes dimensions such as life satisfaction, marital life satisfaction, lack of depression and anxiety, and positive moods and emotions (13-14). One of the important variables which can play a very important role in determining psychological well-being is spiritual beliefs (15). Spiritual beliefs can be

considered as one of the human dimensions that help people's awareness and self-knowledge (16). In fact, this awareness may lead to an experience that is beyond one's own. In addition to these beliefs, spirituality is an awareness of existence and a force beyond the material aspects of life, as well as a deep connection with the universe (17).

One of the other concepts arising through spiritual beliefs in people is finding meaning. Finding meaning is considered as a process of life that provides a sense of connection and connectedness and growth for a person (18). For this reason, it can be said that strengthening religious beliefs in people makes them more capable in facing difficult life conditions (18, 9). Studies have shown that strong spiritual tendencies and positive attitude promote health (20-21). Spiritual beliefs can directly or indirectly affect the psychological well-being of infertile people (22). In its indirect form, these beliefs, by affecting people's skills such as emotional regulation, help them to improve their psychological well-being or moderate painful emotions caused by experiences such as depression and anxiety (23).

Emotional regulation includes a range of conscious and unconscious cognitive and behavioral strategies that are used to reduce, maintain or increase an emotion. Research results have shown that people, when faced with stressful events, use different emotion regulation strategies to modify or adjust their emotional experiences (24). In the cognitive strategies of emotion regulation, cognitions or cognitive processes help people to regulate their emotions and reduce the intensity of unpleasant emotions (25-26). Studies have shown that spirituality can reduce the feeling of loneliness in infertile women, and on the other hand, it increases psychological well-being and perceived social support in these women (27-28).

A study involving 231 women demonstrated that spirituality significantly influences mental health and burnout by mediating emotion regulation strategies. Spirituality affects women's mental well-being both directly and indirectly through its role in emotion regulation (29). Further research indicates that emotion regulation may strengthen spiritual beliefs and

mental health, simultaneously reducing health concerns and psychological distress in women with depression (30). Additionally, a systematic review of 51 studies found that religious and spiritual attitudes support individuals' resilience in disaster contexts. Religious and spiritual orientations thus act as protective factors, fostering adaptive emotion regulation strategies—such as positive reappraisal, self-awareness, and acceptance—which enable individuals to effectively manage challenging situations (31).

According to what has been discussed, it can be said that infertility as a crisis in the marital life of couples can affect the interpersonal relationships as well as the interpersonal experiences of the couple. For this reason, it is necessary to identify the variables that contribute to the psychological well-being of couples in order to help couples face the infertility crisis and improve their psychological well-being. In addition, in the Iranian society, the problem of infidelity for women is associated with more social, cultural and cognitive consequences compared to men (3, 22). For this reason, it is necessary to address the issue of psychological well-being of women who are involved in problems related to infertility and recognize the variables that are directly and indirectly related to it. Therefore, the present study was conducted to investigate the role of spirituality in psychological well-being through the mediation of emotion regulation among women involved in infertility problems.

Materials and Methods

This research used a predictive correlational design that was performed in 2021. In this research, spirituality was considered as an independent variable, psychological well-being variable as a dependent variable, and emotion regulation variable as a mediating variable. The statistical population included all infertile women referring to the infertility centers of Isfahan and Qom provinces. Based on the table of Krejcie and Morgan, 384 sample sizes were estimated. Taking into account the possibility of sample loss, 430 questionnaires were distributed among women who met the inclusion criteria and were willing to cooperate voluntarily. The sampling was done using

convenience sampling. The inclusion criteria were being a female, not having children, not having a psychiatric disorder, and not using psychiatric medications and drugs. Finally, 400 people who completed the questionnaires correctly were considered as the research sample.

Data collection tools included Spirituality Assessment Inventory (SAI) (1996) by Hall et al., and Ryff's scale of Psychological well-being, short form (18-item) and Emotion Regulation Questionnaire by Gross and John (10 questions).

Spirituality Assessment Inventory (SAI): This tool has been used by Hall et al. (1996) to investigate the effect of spiritual orientation. This questionnaire consists of two main dimensions of the quality of relationship with God and awareness of God and six subscales of awareness, true acceptance, despair, magnification, instability and effectiveness control. This scale is a 47-question self-report tool that the subject should express his agreement or disagreement with each of the statements on a 5-point Likert scale. The scores of each scale are added together algebraically and their score is obtained. This questionnaire does not have a reverse score. Examining the reliability of this scale with the homogeneity method showed that the Cronbach's alpha coefficient of the subscales of awareness, true acceptance, disappointment, magnification, and instability and impression management were 0.95, 0.83, 0.90, 0.73, 0.84 and 0.77, respectively (32). Also, in this study, Cronbach's alpha coefficient of the subscales of awareness, true acceptance, disappointment, magnification, and instability and impression management were obtained 0.95, 0.83, 0.90, 0.73, 0.84, and 0.77, respectively.

Ryff's scale of Psychological well-being (short form of 18 questions): The short form of the 18-question psychological well-being scale was designed by Ryff (1989) and was revised in 2002. This scale includes six subscales of autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The sum of the scores of these six subscales forms the total psychological well-being score. Each question is rated on a 6-point Likert scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*), with a

higher score indicating better psychological well-being. Questions 3, 5, 9, 10, 13, 16 and 17 are rated reversely. In Iran, Khanjani et al. (33) calculated the internal consistency of this scale using Cronbach's alpha in six subscales of self-acceptance, environmental mastery, positive relationship with others, purpose in life, personal growth, and autonomy as 0.75, 0.76, 0.75, 0.70, 0.72 and 0.73, respectively and 0.71 for the total scale. In this study also, Cronbach's alpha coefficients for the subscales of self-acceptance, environmental mastery, positive relationship with others, purpose in life, personal growth, and autonomy were calculated as 0.51, 0.76, 0.75, 0.72, 0.73 and 0.72, respectively and 0.74 for the total scale.

Emotion Regulation Questionnaire (10 questions): The scale was compiled by Gross and John (34) in order to measure emotion regulation strategies. This questionnaire consists of two subscales of reappraisal with six statements and suppression with four statements. Each statement is rated on a seven-point Likert scale from strongly disagree (with a score of 1) to strongly agree (with a score of 7). In the study of Gross and John (2012), the internal consistency coefficient for reappraisal was 0.79 and for suppression was 0.73. In Iran, Hoseini (35) reported an alpha coefficient of 0.79 for reappraisal and 0.75 for suppression. In the present study also, the Cronbach's alpha for reappraisal was 0.77 and for suppression was 0.72.

The subjects participating in the research were asked to read the questions carefully and choose the desired answers according to their characteristics and do not leave a question unanswered as much as possible. Data was collected individually and in person

The collected data were analyzed using SPSS-24 and Smart PLS.3 software. At the descriptive level, indicators such as frequency, percentage, mean, and standard deviation were used, and at the inferential level, Cronbach's alpha, composite reliability, Average variance index (AVE), Fornell and Lurker matrix, R2, Q2, SRMR, and NFI were used. $P < 0.05$ was considered statistically significant.

Results

The findings of the study showed that the mean age of the participants was 33.39 ± 8.44 years

and their mean infertility duration was 7.29 ± 5.66 years. The demographic characteristics and Descriptive indicators of the research participants have been shown in Table 1 and 2.

Table 1. Frequency and percentage of demographic variables of the research participants

Variable	Frequency (%)
Age (years)	
20-25	60 (15)
26-30	155 (39)
31-35	109 (27)
36-40	61 (15)
41-45	15 (4)
Total	400 (100)
Education level	
High school	53 (13)
Diploma	126 (31)
Associate degree	60 (15)
Bachelor's degree	132 (33)
Master's degree	26 (7)
PhD	3 (1)
Total	400 (100)
Infertility duration (years)	
1-5	220 (55)
6-10	129 (32)
11-15	41 (10)
16-20	10 (3)
Total	400 (100)

Table 3 shows the effects of direct, indirect and total coefficients of the whole model designed in this study. The direct effect of spirituality on psychological well-being with a value of 0.24 and $p < 0.01$ was significant, similarly, the indirect effect of spirituality on psychological well-being with a value of 0.31 and $p < 0.01$ was significant.

The direct effect of reappraisal on psychological well-being with a value of 0.59 and $p < 0.01$ was significant, while its indirect effect was not significant. Also, the direct effect of suppression on psychological well-being was not significant; while its indirect effect on psychological well-being with a value of -0.25 and $p < 0.01$ was significant. On the other hand, the direct effects of spirituality on reappraisal and suppression with a value of 0.47 and -0.12, respectively and $p < 0.01$ were found significant

(Figure 1,2,3). Table 5 shows that the variable of spirituality has a significant effect on psychological well-being. This effect is negative through suppression.

Table 2. Descriptive statistics indicators of the research variables

Variables	Skewness	Kurtosis	Mean	Standard deviation
Spirituality	-0.57	0.32	186.85	28.56
Reappraisal	-1.21	2.33	14.14	3.24
Suppression	0.32	-0.13	15.19	5.84
Psychological well-being	0.77	1.96	69.76	11.12

Table 3. Coefficients of direct, indirect and total effects of research variables towards psychological well-being

Independent	Dependent	Direct effect	Indirect effect	Total effect
Spirituality	Psychological well-being	0.24**	0.31**	0.55**
Reappraisal	Psychological well-being	0.59**	0.04	0.64**
Suppression	Psychological well-being	-0.09	-0.25**	0.09
Spirituality	Reappraisal	0.47***		0.74**
Spirituality	Suppression	-0.12**		-0.37**

P<0.01 **

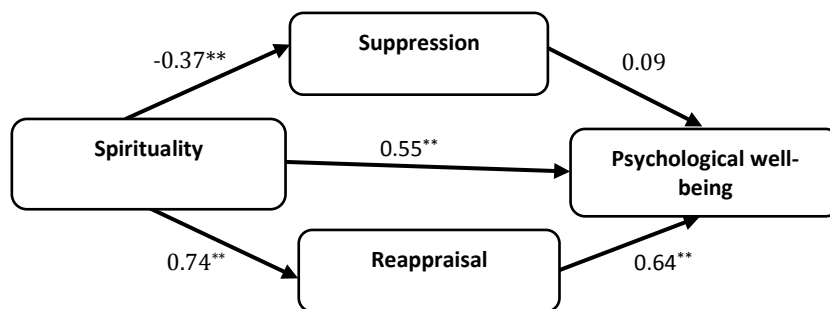


Figure 1. Total effects of independent and mediators on psychological well-being

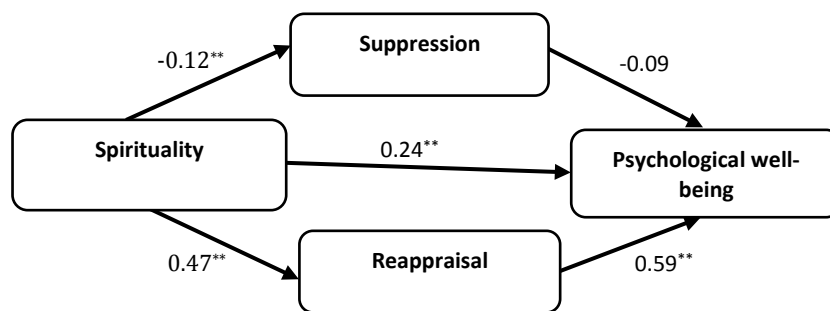


Figure 2. Direct effects of independent and mediators on psychological well-being

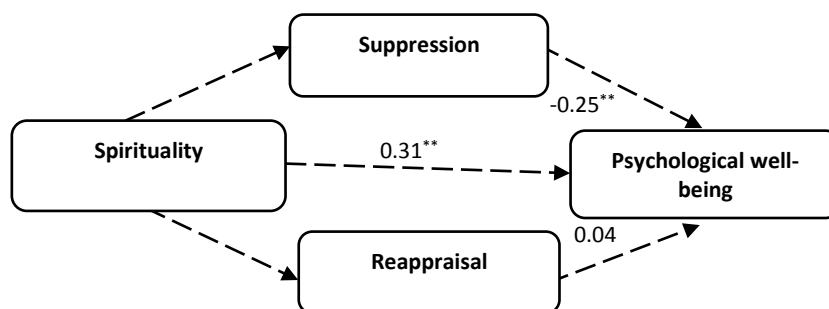


Figure 3. Indirect effects of independent (spirituality) on psychological well-being

Table 4 shows the AVE, composite reliability and Cronbach's alpha indices to determine the convergent validity of the research model. As shown in Table 4, all AVE index values were greater than 0.5. Also, all values of composite

reliability coefficients and Cronbach's alpha were greater than 0.70. Therefore, all the values of AVE, composite reliability and Cronbach's alpha indices were in a favorable range; so, it can be said that the research model had good convergent validity.

Table 4. The values of AVE, composite reliability and Cronbach's alpha to determine convergent validity

Variable	AVE (>0.5)	Composite reliability (>0.6)	Cronbach's alpha (>0.7)
Psychological well-being	0.85	0.90	0.82
Spirituality	0.88	0.92	0.92
Reappraisal	0.62	0.84	0.81
Suppression	0.59	0.82	0.79

Table 5 shows the Fornell and Lurker matrix to determine the validity of the research model. The values in the diameter of the matrix are

larger than the other values in the same row. When such conditions are established in Fornell and Lurker's matrix, it indicates the desired divergent Validity of the research model.

Table 5. Fornell and Lurker matrix to examine divergent validity

Variable	1	2	3	4
Reappraisal	0.72			
Suppression	-0.60	0.78		
Psychological well-being	-0.76	-0.58	0.81	
Spirituality	0.47	-0.37	0.55	0.84

The results of Table 6 shows the fit indices of the research model. R2 values were calculated between 0.14 and 0.63, which are in the moderate range. According to experts, the

optimal value of Q2 between 0.02 and 0.10 indicates weak predictive power, between 0.11 and 0.25 moderate, and above 0.25 indicates strong predictive power (36).

Table 6. Fit indices of the research model

Variable	R ²	Q ²	SRMR	NFI
Spirituality		0.57	0.06	0.89
Psychological well-being	0.63	0.50		
Reappraisal	0.42	0.41		
Suppression	0.14	0.30		

As shown in the above table, Q2 values are in the moderate to strong range. The desired value of SRMR index is less than 0.08 (37) and the value obtained in the study is 0.06. Therefore, it can be said that the fit of the research model is in an acceptable range. The NFI index is one of the other indices that if it is greater than 0.80, it indicates the optimal fit of the model (38). In the current research model, NFI=0.89, which is in the optimal range and indicates the optimal fit of the model.

Discussion

The aim of this study was to investigate the role of spirituality in the psychological well-being by mediating role of emotion regulation among infertile women. The results showed that the designed model in which spirituality directly or through mediation of emotion regulation methods, reappraisal and suppression was predictive of the psychological well-being of infertile women. The results showed that the research model has good divergent and convergent validity. Also, the fit indices of the model showed that all the indices are in the desired range. In general, it can be said that spirituality could predict the psychological well-being of infertile women both by itself and through the mediation variable.

This finding of the study is consistent with the findings of Abbasi and Rezazadeh (2012). In their study, it was found that infertile women suffer a lot of stress and distress in cognitive, emotional and behavioral fields (3). Kalani (2023) also showed in a review study that Iranian women who are involved in the phenomenon of infertility have tension and conflict in different psychological and social fields (39). These challenges had affected their marital sexual performance and hope of fertility. Also, Salehi (2019) showed that spiritual beliefs focused on religion can play an important role in predicting mental security and distress tolerance (27).

The experience of infertility is a bitter and difficult phenomenon in which a person endures a lot of stress. In this research also, it was found that spirituality can affect the psychological well-being of infertile women through emotional regulation mechanisms. This finding is consistent with the finding of Golbar Yazdi (2012). They showed that teaching

psychological well-being to infertile women is effective in reducing their stress and distress (14).

Spirituality can strengthen stress coping mechanisms in people. First, spirituality can help people deal with stress effectively by creating a sense of purpose. Second, spirituality reduces the feeling of loneliness in people by creating the feeling that a person has a connection with the other world and causes a valuable sense of peace during difficult experiences (40). Third, people with spirituality stop controlling, because people feel that they belong to a bigger world and realize that they are not responsible for everything that happens in life (41). Fourth, having spiritual tendencies can expand people's support network (27). A person can be connected with religious places and communities and develop the support networks of his family and friends. Fifth, spirituality can lead people to a healthier life. People who consider themselves spiritual are better able to manage their stress in difficult situations. In general, it can be said that spirituality affects people's psychological responses to phenomena through its influence on the cultural, social and religious context of people (42).

The findings of the research showed that emotion regulation strategies, including reappraisal directly and suppression indirectly affect the psychological well-being of infertile women. Reappraisal is a positive emotion regulation strategy (43-44). In this strategy, a person has the necessary cognitive skills to respond to emotional situations, through which a person is aware of their cognitive, psychological and physiological antecedents before engaging with emotions, and by using the skill of self-awareness interpret and evaluate the situation and emotional experiences (45). Therefore, his responses may be aimed at adjusting or changing the environment or emotions. In contrast, people who use the strategy of emotional suppression try to suppress or prevent their emotional states. In other cases, emotional suppression may respond to the situation with emotional behaviors without evaluation and interpretation (46). In fact, in this strategy, the person first gives the answer to the situation, and continues

to be involved with its emotional responses (43-42).

The results of the present study showed that the suppression strategy to regulate emotions had a negative effect on the psychological well-being of women. Its main cause is people's inability to cognitively process emotional information and regulate emotions. In such a situation, people have difficulty in identifying emotions, describing emotions and objective thinking (46). Difficulty in identifying emotions in people with emotional dyslexia is that these people cannot distinguish between their emotions and recognize them (47). These people experience intense emotions inside themselves such as sadness, fear, shame, anger, hatred and happiness, but in their reactions, they are unable to express these emotions and describe them and the factors which caused them. The experience of emotions in such people is vague, inseparable and undifferentiated (26).

Another important point that should be mentioned in this regard is that in Iranian society, due to the dominance of Islamic culture, the spiritual tendencies of the citizens are mostly religious (48). From this point of view, it can be said that religion helps people's psychological well-being. People who benefit from religious teachings in their lives when faced with painful and stressful experiences in life, they consider these issues to be divine test (49). These people have a spiritual relationship with God, and instead of suppressing their emotions, they interpret them in the form of a spiritual relationship with God. In addition, religious people by performing religious acts such as prayer, fasting and supplication get rid of negative and painful emotions (50).

One of the limitations of the current research is the lack of identification of religious and non-religious spiritual tendencies of people. Religious and non-religious spiritual tendencies of people can affect their psychological well-being in different ways. Focusing on the individual dimension of psychological well-being was one of the other limitations of this research. Because infertility not only affects the individual but also the marital life of both couples and their families. Not considering the support network that the research participants

had was the other limitation of this study. The support network of people also influence the psychological well-being of people during infertility.

A key strength of this study is its demonstration that spiritual tendencies, both independently and through the mediation of emotion regulation strategies, can enhance the psychological well-being of individuals facing infertility challenges. Furthermore, this research contributes valuable insights to the field by emphasizing the crucial role of emotion regulation strategies in directly improving the psychological well-being of individuals experiencing infertility difficulties.

Conclusion

Overall, the findings of this study suggest that spiritual attitudes can directly and indirectly improve the psychological well-being of couples facing infertility challenges through the use of emotion regulation strategies. It is important to note that the appraisal strategy of emotion regulation has a positive impact on psychological well-being. According to the findings of the research, infertile women and couples should be given the necessary training in the field of emotion regulation strategies in the form of educational workshops, clips and booklets in order to improve their psychological well-being. It is also suggested that counseling based on spiritual approaches be offered to infertile women and their husbands in order to improve their psychological well-being.

Declarations

Acknowledgements

The authors would like to express their sincere gratitude to the participants of this research, as well as the staff at the infertility centers of Isfahan province (specifically, the Esfahan infertility center and Shariati hospital infertility center) and Qom province (specifically, the Jihad University infertility center and Khairin Salamat hospital infertility center).

Conflicts of interest

Authors declared no conflicts of interest.

Funding

It was funded by the Vice President of Research of Qom University of Medical Science.

Ethical approval

The research adhered to essential ethical principles, including voluntary participation, strict confidentiality of participants' information, and the acquisition of informed consent from both the subjects and their spouses.

This research obtained ethical approval from the Research Ethics Committee at Qom University of Medical Sciences (IR.MUQ.REC.1399.236).

Authors' contributions

SK designed the study and led the research team. SD conducted the data collection and performed the statistical analysis. FK contributed to the literature review and manuscript writing. MH provided critical revisions and ensured the integrity of the data. All authors reviewed and approved the final version of the manuscript.

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