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The Effect of Telemedicine-Based Massage Training to Spouses on the Resilience of Pregnant Women during the Coronavirus Pandemic

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ABSTRACT

Background & aim: Pregnancy due to hormonal changes can cause psychological changes such as increased depression, stress, anxiety and decreased resilience, which could be more complicated during coronavirus pandemic. Massage may be beneficial for a number of mental health conditions. The aim of this study was to determine the effect of telemedicine-based massage training to spouses on the resilience of pregnant women during the coronavirus pandemic.

Methods: This randomized clinical trial was performed on 120 pregnant women attending health care centers in Mashhad, Iran by available sampling method in 2021. Spouses of pregnant women in the intervention group received massage training by telemedicine. The intervention group performed the trained items for their pregnant wives three times a week for four weeks. The control group received only routine pregnancy care. Data collection tools included Conor and Davidson resilience questionnaires and DASS-21 questionnaires which were completed in person before, immediately after and 4 days following the intervention. Data were analyzed by SPSS statistical software (version 24) and descriptive and analytical statistical methods.

Results: At the beginning of the study, resilience score did not differ significantly between the two groups (P=0.235). But immediately after and 4 days after the intervention, there were significant changes in resilience scores (P <0.001).

Conclusion: The results of this study showed that teaching telemedicine-based massage to spouses during the coronavirus pandemic can increase the resilience of pregnant women. Since resilience is one of the components of mental health, increasing the resilience of pregnant women improves their mental health.

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Introduction

Coronaviruses (CoV) are a large family of viruses that cause acute respiratory illnesses. The outbreak of the new virus began in December 2019 in Wuhan, China, and spread to most countries of the world, causing the COVID pandemic (1-2). It caused public health concerns and some psychological disorders, including anxiety, fear, depression, avoidant behaviors, irritability, sleep disturbances, and post-traumatic stress disorder (1-4). Pregnant women are more likely to be infected by the COVID-19 disease; due to the physiological changes and decreased functioning of the immune system during pregnancy, pregnant women are completely susceptible to this disease (2, 7). Pregnancy is one of the most important and stressful events in a woman's life and is associated with significant physical and mental changes (8). Mental changes include increased psychosis, phobias, depression, stress,

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and anxiety, as well as decreased resilience (9-12). More attention is often paid to the physical and physiological dimensions of pregnancy than its mental and psychological dimensions (13). As mentioned, resilience decreases in coronavirus pandemics due to home quarantine conditions and special conditions for pregnant women. Resilience is the process and outcome of successfully adapting to difficult or challenging life experiences (14-16). Connor and colleagues define it as a way to measure a person's ability to deal with stressors and factors threatening a person's mental health (15, 16). Young-Wolff et al. (2019) stated that 44% of pregnant women have low resilience (17). Resilience means maintaining calm in stressful situations, having flexibility in the face of obstacles, avoiding erosive strategies, maintaining optimism and positive feelings in times of difficulty, and getting rid of internal obstacles (18). On the other hand, anxiety and stress can reduce resilience. Pregnant women's stress and anxiety about their baby's health and pregnancy-related issues are among the most common mental disorders during pregnancy, and they are even more common during coronavirus disease (2, 9). Sadeghi et al. (2014) concluded that 42.6% of pregnant women have high anxiety (19). According to Moghanibashi-Mansourieh et al. (2020), the general Iranian population is 95% anxious during the coronavirus pandemic (20). Corbett et al. (2020) studied behavioral changes and anxiety in pregnant women during the coronavirus pandemic and reported that 83.3% of pregnant women had high anxiety (21). Therefore, since increasing anxiety during pregnancy has many side effects, such as gestational hypertension, preterm delivery, low birth weight, and fetal distress, it is necessary to reduce anxiety or increase resilience during this period. So far, several studies have been conducted to reduce stress and anxiety during pregnancy (12, 22). Bijari and colleagues (2015) showed in their study that resilience has a significant inverse relationship with anxiety, so resilience decreases with increasing anxiety (23). Massage through the hypothalamus affects the parasympathetic nerve and reduces factors such as heart rate, blood pressure, metabolism, respiration rate, and oxygen consumption, as well as promoting relaxation and pain relief, which results in reduced anxiety. Massage during pregnancy is one of the most important non-pharmacological interventions used to reduce anxiety and stress. In this regard, several studies have shown the effect of massage on reducing anxiety and stress during this period (22, 24, 25). The husbands of pregnant women can best do massage. Therefore, one of the useful solutions is to teach massage to the spouses of pregnant women. Family-centered education is more effective than self-education (26). Men's participation in prenatal care reduces anxiety and increases acceptance of prenatal care (27-29). Numerous studies have emphasized the importance of educating spouses as partners (30). Alhusen et al. (2012) showed that a spouse's support during pregnancy makes this period enjoyable, increases maternal and fetal relationships, and increases the mental health of pregnant women (31). Somers-Smith (1999) showed in their study that men's support for pregnant women during pregnancy reduces anxiety (32). Massage education for spouses can be done in two ways: face-to-face education or distance education (8). Distance education or telemedicine is a very flexible method that can be changed according to the client's conditions, facilities and equipment can be changed according to the required program. Also, distance education reduces costs and gives people quicker access to high-quality services (33-36).

Due to the lack of a similar study in this regard, the present study was performed to determine the effect of telemedicine-based massage training for spouses on the resilience of pregnant women during the coronavirus pandemic.

Materials and Methods

This clinical trial was registered under the code of IRCT20170607034378N2 in the Iranian Registry of Clinical Trials. The study was performed in 2021 on 120 pregnant women (60 in the intervention group and 60 in the control group) who met the inclusion criteria. To calculate the sample size, the sample size formula was used to compare two independent sample. The information required for this formula was identified using a pilot study. Based on the formula used, the sample size was

calculated at 59 sample, and finally, 60 sample were considered for each group.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 (s_1^2 + s_2^2)}{d^2} = 59.04$$

$\alpha = 0.05$
$\beta = 0.02$
$s_1^2 = 12.6$
$s_2^2 = 10.6$
$d = 6$

Inclusion criteria consisted of being Iranian and resident of Mashhad, being literate, having access to internet and WhatsApp software, having gestational age of 28 to 34 weeks based on the first day of the last menstrual period or first-trimester ultrasound and singleton pregnancy, experiencing no stressful accidents in the last six months, having no obstetric problems during pregnancy, no medical condition, no history of infertility and using assisted reproduction methods, no history of mental illnesses and having depression, anxiety, and stress scores based on DASS 21 questionnaire less than 10, 14, 17, respectively; also having no smoking (hookah, cigarettes, snuff, drugs) or use of alcohol and psychotropic drugs. absence of skin complication such as skin wound burns or bone complications such as fracture of neck, back or leg.

Exclusion criteria included withdrawal from continuing research and not performing massage exercises for two consecutive periods. This study was approved by the ethics committee of the Islamic Azad University of Mashhad and a written introduction letter was submitted to the health deputy of the province and obtained permission and presented to the head of health centers for sampling. Finally, two health centers in Mashhad were selected by lottery. Then, to prevent the dissemination of data, the lottery was again conducted, and one center was considered as the intervention group and another as the control group. After obtaining permission from the head of the unit, the pregnant women with the gestational age of 28 to 34 weeks were listed, and their contact number was obtained from the head of the unit. Sampling at first was done by convenience methods and then assigning the sample to the intervention and control groups. The researcher formed two virtual groups in WhatsApp software (one for the control group and another for the intervention group). Then, the pregnant women who met the inclusion criteria, after being explained the objectives of the study and the method of conducting the research and signing a written consent to participate in the study, were randomly added to WhatsApp groups. Then the Connor and Davidson Resilience Questionnaire and the DASS-21 Stress, Anxiety, and Depression Questionnaire were completed online by the participants in both groups. The average time to complete the questionnaires was about 25 minutes. The presence of spouses in training sessions was mandatory.

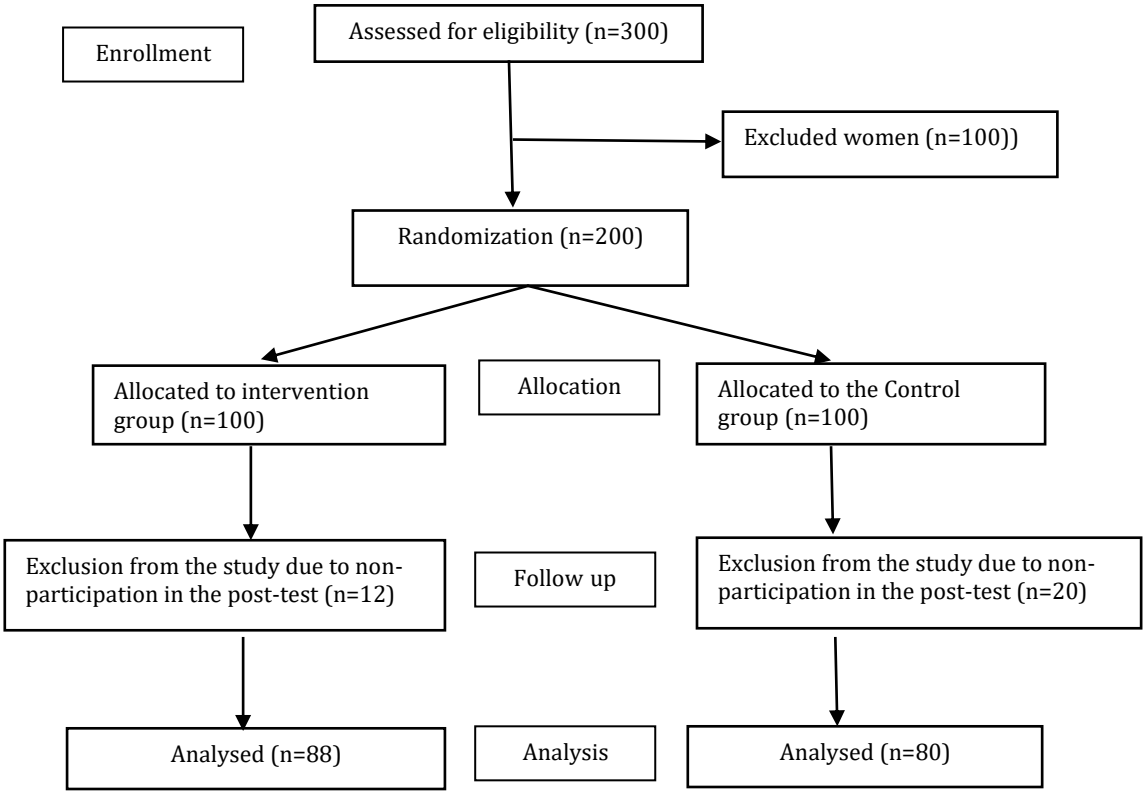
Training sessions were provided in the form of video calls through the software environment for the participants. The content of the sessions was: stating the objectives of the research, discussing psychological changes during pregnancy and the need for a spouse's support during pregnancy, expressing the researcher's expectations from individuals (including cooperation until the end of the research and not informing friends, acquaintances, and other people in cyberspace groups about participating in the research until the end of the study), environmental preparation training before massage, preparation of necessary equipment, massage technique, and questions and answers at the end of the sessions. In the intervention group, massage was taught by the EFFLEURAGE method from the image to the spouses of pregnant women. Participants in the study should perform a back massage (after establishing a calm environment and the correct position of the pregnant woman) for 10 minutes and each limb for 5 minutes (30 minutes in total) (37). The massage technique was performed three times a week (every other day) for up to four weeks (a total of 12 times) at night before going to bed. After 2 weeks from the beginning of the research, the researcher made a telephone call with the participants of the intervention group to follow up on the subjects. Participants in both groups completed the Connor and Davidson Resilience Questionnaire and the DASS-21 anxiety-stress-depression questionnaire immediately after the end of the last massage session and four days (38) after the

end of the last massage session. The control group received only routine pregnancy care. After two weeks from the beginning of the research, the researcher made a telephone call with the participants of the control group to follow up them. Also, to observe the ethical issues, an educational video of massage during pregnancy was given to the control group at the end of the research. The study diagram is shown in Figure 1.

The tools used in this study were the Resilience Questionnaire and the DASS-21 Stress-Anxiety-Depression Questionnaire. The questionnaires were completed in the presence of the researcher and by the participants in the research.

The Resilience Questionnaire consists of 25 items, which are scored on a Likert scale from zero (completely incorrect) to five (completely correct). The questionnaire scores ranged from 0 to 100. Higher scores indicate more resilience. The validity of the questionnaire has been confirmed by Mohammadi (2005) (39).

Figure 1. The CONSORT flow diagram of intervention in the two groups



Cronbach's alpha coefficient of 0.89 confirmed the reliability of the questionnaire in Mohammadi's study (2005) (39). In the present study, the reliability of this questionnaire was confirmed by the internal consistency method with Cronbach's alpha coefficient of 0.85.

In the present study, the reliability of this questionnaire was confirmed by the internal consistency method with a Cronbach's alpha coefficient of 0.85. The DASS-21 Stress-Anxiety-Depression Questionnaire consists of 21 questions. Questions 3, 5, 10, 13, 16, 17, and 21 are related to the depression subscale; questions 2, 4, 7, 9, 15, 19, and 20 to the anxiety subscale; and questions 1, 6, 8, 11, 12, 14, and 18 to the stress subscale. The questions are answered in 4 options. The range of responses varies from "never = 0" to "always = 3." Scores 6-8, 4-5, and 5-6 are mild depression, anxiety, and stress, respectively, and scores greater than 10, 14, and 17 are very severe depression, anxiety, and stress, respectively. The validity of the questionnaire has been confirmed by Mollahadi and colleagues (2010) (40). Jalal Marvi et al. (2018) confirmed the reliability of this questionnaire with a Cronbach's alpha of 0.92 (8). In the present study, the reliability of this questionnaire was confirmed by the internal consistency method with a Cronbach's alpha coefficient of 0.89.

Data were analyzed by SPSS (version 24) and independent t-test, Chi-square test, and Mann-Whitney test.

Results

A total of 120 pregnant women (60 in each group) were included in the study, but data analysis was performed on 115 (57 in the intervention group and 58 in the control group). The results showed that all demographic characteristics of the intervention and control groups were homogeneous at the beginning of the study, and there was no statistically significant difference between the two groups (Table 1).

Table 1. Demographic characteristics of subjects in two groups

Variable	control group Mean±SD	Intervention group Mean± SD	Independent t-test result
Mother's age (years)	24.96±4.22	25.22±4.57	P=0.750 T=0.320
Spouse age (years)	27.7±4.21	28.38±4.43	P=0.402 T=0.842
Gestational age (weeks)	30.18±1.83	29.88±4.08	P=0.603 T=0.52
Gravida	2.15±1.05	2.07±0.97	P=656 T=0.447
Number of children	0.86±0.82	0.78±0.79	P=0.632 T=0.482
Body Mass Index	22.86±3.28	23.1±2.89	P=646 T=0.461
Number of prenatal care	2.34±0.61	2.43±0.59	P=0.499 T=0.678

Independent t-test showed no statistically significant difference between the two groups in terms of resilience, stress, anxiety, and depression scores before the intervention, but immediately after the intervention and 4 days after the intervention, a statistically significant difference was observed between the two groups. Friedman's intragroup test showed that intragroup changes in resilience, stress, anxiety and depression scores were significant in both groups, but intragroup changes in depression scores in the intervention group were not statistically significant (Table 2).

Table 2. The resilience, stress, anxiety, and depression scores at the beginning of the study, immediately and four days after the intervention in the intervention and control groups

Variable	control group	Intervention group	Independent t-test result
	Mean± S.D	Mean± S.D	
Resilience			
before intervention	68.06±11.72	66.28±11.48	P=0.410 T=0.826
after intervention	64.43±11.19	72.28±11.62	P=0.001 T=3.641
4 days after intervention	63.22±10.94	70.89±11.26	P=0.001 T=3.704
Friedman Intragroup Test	P=0.001 Chi=42.203	P=0.001 Chi=21.330	
Stress			
before intervention	5.58±4.28	5.42±14.4	P=0.834 T=0.290
after intervention	6.93±3.52	4.68±4.43	P=0.003 T=-3.010
4 days after intervention	6.91±3.62	4.91±4.90	P=0.011 T=-2.592
Friedman Intragroup Test	P=0.001 Chi=19.181	P=0.020 Chi=7.801	
Anxiety			
before intervention	3.01±2.85	3.24±2.74	P=0.663 T=0.437
after intervention	4.81±2.43	2.01±2.23	P=0.001 T=-6.414
4 days after intervention	4.93±2.58	1.84±2.11	P=0.001 T=-7.007
Friedman Intragroup Test	P=0.001 Chi=70.527	P=0.001 Chi=59.58	
Depression			
before intervention	1.43±1.75	1.70±1.56	P=0.386 T=0.871
after intervention	1.65±1.91	1.57±1.58	P=0.817 T=-0.233
4 days after intervention	1.68±1.72	1.66±1.46	P=0.939 T=-0.077
Friedman Intragroup Test	P=0.030 Chi=7.000	P=0.465 Chi=1.524	

Discussion

According to the results of the present study, there were significant differences between the control and intervention groups after the intervention, and resilience scores increased in the intervention group. Also, in the intervention group, the mean scores of stress and anxiety immediately after the intervention and 4 days after the intervention had a significant decrease compared to before the intervention, but the depression scores did not change significantly between the two groups. In this regard, the results of Adib-Hajbaghery et al. (2012) showed that full-body massage therapy, both by the nurse and by the patient, reduces the obvious anxiety of patients admitted to the CCU. In other words, they reported that full-body massage therapy, regardless of who does it, can be effective in reducing anxiety (41). Also, the results of the study by Kamarzarrin et al. (2012) showed that yoga exercises have a significant effect on increasing resilience and promoting women's general health. They also stated that yoga, by promoting resilience in women, increases problem-solving skills and social competence, and helps women have a clearer

view of the future (41). Pourasghar et al. (2017) reported in their study that therapeutic hypnosis significantly increases resilience (42). Mirzaee et al. (2010) also indicated that reflexology reduces the level of anxiety during childbirth (43). Massage reduces pain and anxiety, according to Akköz evik et al. (2020) (38). The results of Bazrafshan et al.'s (2010) study showed that massage is an effective nursing intervention to reduce the level of anxiety in nulliparous pregnant women (22). Massage of cancer patients undergoing chemotherapy was also investigated by Robison et al. (2017) (44) and massage of the back in leukemia patients was investigated by Miladinia et al. (2011) (45). n addition, the results of a study by Castro-Sánchez and colleagues (2011) performed on patients with fibromyalgia showed a significant difference in sleep quality between the two groups after massage (46). Ejindu (2007) reported that facial and foot massage induces sleep and thus improves sleep quality in healthy individuals (47). Ejindu (2007) reported that facial and foot massage induces sleep and thus improves sleep quality in healthy individuals (47). Also, Tsay et al. (2003), in a study performed on patients with chronic renal failure, reported that massage therapy improved sleep quality and also improved patients' quality of life (48). Field et al. (2007) showed that sleep disorders were significantly reduced in the intervention group at the end of the study (49). Also, in another study, Jane et al. (2011) reported that massage therapy reduces pain, improves sleep quality, and improves mood and relaxation in patients with metastatic bone pain (50). Moreover, Braun et al. (2012) showed that massage therapy reduces pain, anxiety, and muscle spasms and increases the feeling of relaxation and satisfaction in patients undergoing heart surgery (51).

Contrary to the results of the present study, Nerbass et al. (2010) showed that the quality of sleep in the massage therapy group was much better than the control group, but this difference was not statistically significant (52). In addition, the results of a meta-analysis by Pan and colleagues showed that breast cancer patients who regularly used massage had significantly fewer symptoms of anger and fatigue; however, no significant differences were observed in the massage therapy group in terms of depression, anxiety, pain, lymphedema of the upper extremities, cortisol level and quality of life (43). Krohn et al. (2009) performed a study on patients with breast cancer and reported that the level of stress and mood did not show a significant difference after massage therapy (54). Also, Albert and colleagues reported no significant difference between the two groups in terms of pain after massage therapy in patients undergoing heart surgery (55). Moreover, Valiani et al. (2018) showed that foot reflexology massage in the third and fourth stages of labor had no significant effect on labor pain (56). This discrepancy in the studies can be attributed to the type of massage method used, the nature of the pain, and the study population. In this regard, the results of the study by Rapaport et al. (2018) showed that massage therapy is effective for mental health and improves mental health disorders (57). Since resilience can guarantee and promote mental health, the results are justifiable (58-60). The effect of massage has also been confirmed in various studies (61-62).

According to the results of other studies and the present study, massage therapy can be recommended as an effective measure to promote health. In addition, pregnant mothers who need more emotional support may lose this support due to limitations imposed by the COVID-19 virus and reduced contact with their relatives. Thus, interventions without endangering the health of the mother and fetus and without the need for frequent visits by pregnant women and their families to medical centers can increase the resilience of pregnant women. As a result, the mental health of pregnant women, who are an important part of society, is improved. As stated in all studies, most intervention methods, including training and reflexology, can improve the physical and mental health of participants.

One of the strengths of the present study was the participation of spouses in the interventions. Also, important variables related to the mental health of pregnant women, especially in the current situation in Iran and the world, were not examined. However, the lack of similar studies makes it difficult to generalize the results. For this purpose, it is recommended that more

studies be performed on people of different cultures and different gestational ages, as well as in the postpartum period.

Conclusion

The results of the present study showed that telemedicine-based massage training for spouses during the coronavirus pandemic can increase resilience and reduce anxiety and stress in pregnant women. Since resilience, anxiety, and stress are components of mental health, increasing resilience and reducing anxiety and stress in pregnant women lead to improvement and promotion of the mental health of pregnant women.

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Conflicts of interest

The authors declared no conflicts of interest.

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