

Effect of COVID-19 Self-care Training via Telemedicine on Perceived Stress and Corona Disease Anxiety in Pregnant Women: A Quasi-experimental Study

Motahhare Hashemzahi (MSc)¹, Samira Khayat (PhD)^{2*}, Somayyeh Khazaeian (PhD)²

¹ MSc Student, Department of Midwifery, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran

² Assistant Professor, Pregnancy Health Research Center, Zahedan University of Medical Sciences, Zahedan, Iran

ARTICLE INFO	ABSTRACT
<p><i>Article type:</i> Original article</p> <hr/> <p><i>Article History:</i> Received: 24-Oct-2021 Accepted: 08-Nov-2021</p> <hr/> <p><i>Key words:</i> Self-care COVID-19 Telemedicine Perceived Stress Anxiety Pregnancy</p>	<p>Background & aim: The coronavirus pandemic has increased stress and anxiety among pregnant women and established barriers to in-person care around the world. Accordingly, the purpose of this study was to determine the effect of COVID-19 self-care training via telemedicine on perceived stress and corona disease anxiety in pregnant women.</p> <p>Methods: The present quasi-experimental study was conducted on 100 pregnant women who referred to comprehensive health centers in Zahedan, Iran between June and September 2021. The sample was randomly assigned into two groups of 50 subjects. The intervention group received the educational content via WhatsApp Messenger in six sessions. Data collection tools were Perceived Stress Scale (PSS) and Corona Disease Anxiety Scale (CDAS). The self-administered questionnaires were completed before the intervention and one month after the training program.</p> <p>Results: After the intervention, mean PSS score in the intervention group (25.34±6.63) was significantly reduced compared to the control group (28.42±5.75) (p=0.015). Also, mean CDAS score in the intervention group (13.14±7.29) had a significant decrease compared to the control group (20.54±6.67) (P<0.001).</p> <p>Conclusion: The results of our study confirmed the effectiveness of COVID-19 self-care training via telemedicine in reducing the perceived stress and anxiety of pregnant women during the coronavirus pandemic. Therefore, the use of this method in the care of pregnant women is recommended to mitigate stress and anxiety.</p>

► Please cite this paper as:

Hashemzahi M, Khayat S, Khazaeian S. Effect of COVID-19 Self-care Training via Telemedicine on Perceived Stress and Corona Disease Anxiety in Pregnant Women: A Quasi-experimental Study. Journal of Midwifery and Reproductive Health. 2022; 10(1): 3066-3074. DOI: 10.22038/jmrh.2021.60589.1728

Introduction

Anxiety and stress are among the concerns of pregnant women. Statistics show that the prevalence of pregnancy anxiety is 14-54% in different parts of the world (1). According to a study in Urmia, Iran, 32.5% of pregnant women experienced anxiety and 49.1% of them suffered stress during pregnancy (2). The Coronavirus Disease 2019 (COVID-19) pandemic appears to have increased stress and anxiety in pregnant women worldwide (3). During this pandemic, fear of illness, death, prolongation of quarantine, disease transmission, frustration, fatigue, financial loss, rumors, negative beliefs about

vaccination and stigma have affected mental health of people (4, 5). Adherence to physical distance and quarantine as well as refusal to take part in the community has led to the emergence of mental health problems (6), so that limiting the interaction of people with each other has resulted in enhanced feeling of anxiety, loneliness, hopelessness and even suicide (7). In general, rising fears due to the spread of infection has developed abnormal behaviors in individuals. People suffer from fear, anxiety and distress following continuous warnings of mass media (8). Frequent hearing

* Corresponding author: Samira Khayat, Assistant Professor, Pregnancy Health Research Center, Zahedan University of Medical Sciences, Zahedan, Iran. Tel: 00989151636071; Email: khayatmsc@yahoo.com

about the spread of this disease in the world, including in Iran, is stressful and increases fear and anxiety (9).

Anxiety and stress in pregnancy are associated with a number of complications and consequences such as preeclampsia, depression, increased nausea and vomiting during pregnancy, preterm delivery, low birth weight and low Apgar score (3). If fear, stress and the body's response to them persist in the long run, their effects will be destructive, leading to a weakened immune system and reduced ability of the body to control diseases such as COVID-19 (9). Consequently, relieving stress and anxiety is an important component of maternal care.

Stress and anxiety can be relieved by using a number of strategies such as cognitive-behavioral and non-cognitive techniques (10). Studies have documented that self-care education contributes to the reduction of perceived stress (11) and decreases anxiety (12).

A study during the early stages of COVID-19 outbreaks in China found that up-to-date, accurate health information and specific precautions were related with lower levels of stress and anxiety (13). Taking measures to promote self-care potentially reduces negative psychological consequences (14, 15).

Face-to-face visits to health centers have decreased during COVID-19 pandemic. A study in Sistan and Baluchestan Province during COVID-19 epidemic showed that 81.64% of pregnant women refused to receive health services due to fear of COVID-19 infection and had poor self-care (16). Therefore, self-care education programs based on virtual social networks instead of direct education can be effective in this regard (17).

The latest operational guidelines from World Health Organization (WHO) support the use of existing technologies and digital operating systems for self-care programs (18). People can easily receive the required educational information without leaving home or spending money and time (19, 20). During COVID-19 epidemic, online education received more attention both in Iran and in many different countries (19).

Due to the stipulations of quarantine, midwifery care can be organized virtually by maintaining proper supervision in other

appointments in order to decrease the risk of infection as well as frequent visits of pregnant mothers during COVID-19 epidemic. Also, integrated midwifery care can be associated with more benefits for pregnant women (21, 22).

The benefits of telemedicine services are as follows: facilitating and accelerating specialist access to provide counseling services, reducing the burden on clients and facilitating the management of coronavirus crisis, improving reasonable access to services and care, especially in disadvantaged areas. Gaining access to health services in a wider geographical area, as well as helping to complete the electronic health record cycle, controlling chronic diseases, managing resources in the transportation sector can reduce health care costs, save time and speed up consultations. Increasing the speed of service delivery, reducing and eliminating costs and the possibility of round-the-clock access can also be mentioned as the advantages of telemedicine. Simplicity, availability and affordability are among the most important benefits of telemedicine systems (23).

As a new method for education, telemedicine training can be a solution to instruct pregnant women during COVID-19 pandemic (24). Scientific, credible and reliable sources of information are needed to help mothers find answers to their questions, to familiarize with, manage and follow up risk symptoms, and to reduce their own stress and anxiety. However, the literature review revealed that no studies have been conducted on the impact of self-care training via telemedicine on perceived stress and corona disease anxiety in pregnant women. Therefore, the researchers of this study aimed to investigate the effect of telemedicine Covid 19 self-care education on perceived stress and corona disease anxiety of pregnant women referred to health centers in Zahedan.

Materials and Methods

The present quasi-experimental study, which was two-group pretest-posttest design, was conducted on 100 pregnant women referring to comprehensive health centers in Zahedan, Iran between June and September 2021. Sample size was determined based on the following formula:
$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times [(S_1^2 + S_2^2)]}{(\bar{X}_1 - \bar{X}_2)^2}$$

Considering 80% power and 95% confidence interval the sample size was calculated according to the variables in study published by Aksoy Derya (2020), in which ($Z_{1-\frac{\alpha}{2}} = 1.96$, $S_1 = 4.90$, $\bar{X}_1 = 24.25$, $Z_{1-\beta} = 1.64$, $S_2 = 8.48$ and $\bar{X}_2 = 30.04$) (25). The sample size was calculated 37 subjects in each group. For further confidence and to enhance the accuracy, sample size was considered 50 subjects in each group. For sampling, at first the city was divided into four geographical parts, then the list of comprehensive health centers in each region was prepared. The names of the centers were written on a piece of paper, and two health centers were selected in each region via drawing lots. The first selected center in each area was considered for the intervention group and the second center for the control group. Finally, four centers were randomly assigned to the intervention group, and four centers to the control group.

Inclusion criteria were age range of 18-49 years, first pregnancy, literacy, gestational age of 20-28 weeks based on the first day of the last menstrual period or ultrasound of the first trimester of pregnancy, no history of underlying disease, lack of psychiatric illness, addiction, hospitalization in psychiatric ward or use of psychiatric drugs, no experience of major stressful recent events, no history of pregnancy complications, having a mobile phone or PC and the ability to use them for Internet access, obtaining a minimum CDAS and PSS score of 17 and 21.8, and not having a history of COVID-19. Exclusion criteria were as follows: occurrence of any pregnancy-related complications during the study, COVID-19 infection during the study, unwillingness to continue participating in the study, not receiving a telemedicine training session, incidence of major stressful events during the study (serious disease of spouse and child, death of a loved one, accident, severe family dispute, divorce, immigration and financial bankruptcy, diagnosis of a family member with an incurable or life-threatening illness).

Data collection tools included demographic information form, Corona Disease Anxiety Scale (CDAS), and Cohen's Perceived Stress Scale

(PSS). CDAS was meant to assess anxiety caused by the outbreak of coronavirus. This tool has been developed and validated in Iran by Alipour et al. (2019). The final version of this tool has 18 items and 2 components (physical and psychological factors). The items 1 to 9 measure psychological symptoms and the items 10 to 18 determine physical symptoms. The instrument is scored on a 4-point Likert scale (never=0, sometimes=1, often=2 and always=3); therefore, the maximum and minimum scores in this questionnaire are between 0 and 54. High scores of this questionnaire indicate a higher level of anxiety in individuals, so that 0-16 scores show no anxiety or mild anxiety, 17-29 moderate anxiety, and 30-54 severe anxiety (26). In the present study, the reliability of this tool was obtained by calculating Cronbach's alpha of 0.892. The 14-item Perceived Stress Scale (PSS-14) was developed by Cohen et al. (1983), which is scored based on a 5-point Likert scale with minimum and maximum scores of 0 and 56, respectively, where a higher score indicates more perceived stress. The content validity of this questionnaire has been confirmed, and the reliability with Cronbach's alpha for each of the PSS subscales and total scores is between 0.84 and 0.86 (27). The cut-off point of this scale for identifying people with perceived stress is 21.8 (28). In the present study, the reliability of the scale was obtained by calculating Cronbach's alpha of 0.844.

This study was approved by the ethics committee of Zahedan University of Medical Sciences (code: IR.ZUMS.REC.1399.515). All subjects participated voluntarily in sampling and then signed a written informed consent form after receiving information and explanation regarding the objectives of the study. Demographic information form, CDAS and PSS were completed as a self-administered pretest at the center. Those with perceived stress and moderate to severe anxiety were selected as the sample. The name and contact number of the subject were inquired to coordinate the meetings. The researcher's phone number was also provided to the samples to answer any possible questions.

Table 1. Educational content of self-care training via telemedicine

Sessions	Educational content	Educational objectives
1	Introduction to COVID-19	Familiarity with the history of origin and discovery of coronavirus, with the nature and structure of the virus, with the symptoms of COVID-19 infection, with diagnostic tests for COVID-19, with its treatment
2	Familiarity with coronavirus transmission routes and preventing its spread	Familiarity with the ways of virus transmission, with defective thinking about the coronavirus, with personal protective equipment and how to use them and with hygiene tips when arriving at home, and education on removing masks and gloves and cleaning surfaces
3	Teaching ways to prevent and self-care against Coronavirus in communities and organizations	Familiarity with social distancing, prevention of virus transmission in public places and accommodation centers (such as hotels and guesthouses), understanding self-care when visiting health centers and offices, familiarity of mothers with emergency numbers and contacts
4	Learning about the effects of Coronavirus on pregnancy	A review of COVID-19 symptoms in pregnancy, familiarity with the effects of COVID-19 on the fetus and pregnancy, knowing the health measures of mothers with suspected COVID-19, self-care training in case of presence of an infected person at home
5	Familiarity with childbirth care	Knowing how to choose a hospital, familiarity with and management of risk symptoms, understanding management of true labor signs, acquaintance with the principles of hospital prevention
6	Familiarity with postpartum care and breastfeeding principles during the emergence of COVID-19 symptoms	Familiarity with and management of maternal and neonatal risk symptoms, understanding the principles of breastfeeding during the appearance of COVID-19 symptoms, familiarity with ways to reduce mother-to-child viral transmission, recognizing the principles of COVID-19 prevention for mother and baby in postpartum care, summing up the contents

The procedure of teaching via telemedicine approach in this study was such that in addition to routine pregnancy care, the educational content was sent individually to the intervention group every other day in six sessions for two weeks through WhatsApp messengers as shown in Table 1. Educational content included familiarity with COVID-19, understanding the ways and prevention of disease transmission in communities and organizations, acquaintance with the effect of coronavirus on pregnancy, teaching ways to prevent and self-care against the virus in pregnancy, knowing the principles of care and prevention during childbirth, after childbirth and during breastfeeding. The educational content was prepared in the form of audio PowerPoints and then turned into a video format and the subjects were notified before sending the content to them. At each training session, the day after sending the content, the researcher followed up through the same messenger. To ensure that the educational videos were watched, follow-up was performed again before sending the next file; in case of non-

participation, the sample would be excluded from the study. The follow-up was also done through the same program every week. Questions and answers were also possible through the same messenger or telephone call with the researcher. The subjects could receive answers to any questions or concerns from the researcher. Finally, the individual was asked to complete the online CDAS and PSS questionnaires one month after the intervention. The control group received only routine prenatal care and the subjects were only asked to re-complete the online questionnaires one month after completing the baseline questionnaires. Finally, in order to appreciate the control group for their participation, training files were sent to them via messenger and the necessary instructions were provided.

Data were analyzed using Chi-square, independent t-test, paired t-test, Wilcoxon and Mann-Whitney tests via SPSS 21 software, and $P < 0.05$ was considered as significant. Shapiro-Wilk test was also performed to evaluate the normal distribution of data.

Results

In this study, 100 pregnant women participated in two groups of 50 subjects. Findings of this study revealed that the two groups were statistically insignificant and homogeneous in terms of demographic

characteristics, including educational level and occupational status of mother, education level and occupational status of spouse, adequacy of monthly family income and type of pregnancy (Table 2).

Table 2. Demographic characteristics of research units in the intervention and control groups

Variables	Intervention group Frequency (%)	Control group Frequency (%)	Chi-square test results, P-value
Educational level of women			
Primary school	19 (38)	15 (30)	0.674
High school	14 (28)	17 (34)	
Academic	17 (34)	18 (36)	
Educational level of spouse			
Primary school	12 (28)	15 (30)	0.317
High school	19 (38)	12 (24)	
Academic	19 (38)	23 (46)	
Occupational status of women			
Employee	3 (6)	9 (18)	0.065
Housekeeper	47 (94)	41 (82)	
Occupational status of spouse			
Employee	48 (96)	46 (92)	0.400
Housekeeper	2 (4)	4 (8)	
Adequacy of monthly family income from the point of view of a pregnant woman			
Inadequate	10 (20)	11 (22)	0.682
Fairly adequate	23 (46)	26 (52)	
Adequate	17 (34)	13 (26)	
Type of pregnancy			
Intended	45 (90)	43 (86)	0.538
Unintended	5 (10)	7 (14)	

The mean age of women was 23.40 ± 3.96 in the intervention group and 24.68 ± 3.92 in the control group, and the mean age of spouse was 28.02 ± 5.38 in the intervention group and 28.96 ± 3.97 in the control group. The mean gestational age was 23.52 ± 2.90 in the intervention group and 23.58 ± 2.67 in the control group. The results of independent t-test indicated no significant difference between the two groups in terms of mean age of women, age of spouse and gestational age ($P=0.940$, $P=0.226$ and $p=0.216$, respectively).

Mean CDAS score of mothers in the intervention and control groups was 22.90 ± 6.64 and 21 ± 4.02 before the intervention and 13.14 ± 7.29 and 20.54 ± 6.67 after the intervention, respectively. The results of Mann-Whitney test indicated that the mean CDAS score in the intervention and control groups was

statistically significant after training ($P < 0.001$), while this difference was not significant before training in the two groups ($p=0.424$). In addition, the results of Wilcoxon test showed that the mean CDAS score in the intervention group was statistically significant both before and after training ($p < 0.001$), while this difference was not significant in the control group ($p = 0.128$) (Table 3).

Due to the non-normal distribution of data before the intervention, Mann-Whitney test was used for statistical analysis, and considering the normal distribution of data after the intervention, independent t-test was used for statistical analysis. The mean PSS score of mothers in the intervention and control groups was 28.58 ± 5.33 and 27.10 ± 5.69 before the intervention and 25.34 ± 6.63 and 28.42 ± 5.75 after it, respectively.

Table 3. Mean score of Corona Disease Anxiety Scale in pregnancy before and after educational intervention in intervention and control groups

Groups	Intervention group	Control group	Differences in	Mann-Whitney test
Time	Mean±SD	Mean±SD	Mean±SD	results
Before intervention	22.90±6.64	21±4.02	1.90±1.09	P=0.424 z=-0.799
After intervention	13.14±7.29	20.54±6.67	-7.40±1.39	P=0.000 z=-4.916
Wilcoxon test	p=0.000 z=-5.660	P=0.128 z=-1.523		

The results of independent t-test showed that mean PSS score before the intervention was not statistically significant between the two groups (p=0.183) but the mean PSS score was statistically significant between the two groups after intervention (p=0.015). In addition, the

results of paired t-test showed a significant difference in mean PSS score in the intervention group both before and after the intervention (p = 0.005), while this difference was not significant in the control group (p = 0.096) (Table 4).

Table 4. Mean score of Perceived Stress Scale in pregnancy before and after educational intervention in intervention and control groups

Groups	Intervention group	Control group	Differences in	Test results
	Mean±SD	Mean±SD	Mean±SD	
Before intervention	28.58±5.33	27.10±5.69	1.48±1.10	P=0.091* z=-1.691
After intervention	25.34±6.63	28.42±5.75	-3.08±1.24	P=0.015** t=2.479
Paired t-test	p=0.005 t=2.972	P=0.096 t=-1.696		

*Mann-Whitney U Test ** Independent-Samples T Test

Discussion

The findings showed that telemedicine Covid 19 self-care training significantly reduced perceived stress and corona disease anxiety in pregnant women. The literature review revealed that no research has been conducted so far on the effectiveness of telemedicine self-care training on perceived stress and corona disease anxiety of pregnant women.

Ganjali (2017) investigated the effect of distance education on anxiety and stress of pregnant women toward delivery method in nulliparous mothers, and reported a significant difference in the mean post-test scores of anxiety and stress between the experimental and control groups (29). Aksoy Derya et al. (2020) found the tele-education offered to pregnant women can alleviate anxiety, fear of childbirth, and worries of bearing a physically or mentally handicapped child (25). Study of Shabani Minaabad (2019) showed that distance learning package for prevention of COVID-19

disease was effective in reducing corona disease anxiety and phobia of coronavirus disease among language learners (30). All the results of the above studies are consistent with the present study. These researches examined the effect of pregnancy self-care education on prenatal distress, pregnancy-related anxiety, fear of abnormal birth, stress and anxiety about childbirth, health literacy and self-care in diabetic women, but none of them studied self-care in COVID-19 and its effect on corona disease stress and anxiety.

To the best of our knowledge, no studies were found to be inconsistent with the findings of the present study. However, Sharifzadeh et al. (2020) examined the effectiveness of COVID-19-related self-care e-learning on life expectancy of pregnant mothers, and concluded that COVID-19 self-care e-education alone did not increase life expectancy in pregnant mothers (31). The results of this study were inconsistent with the present findings probably due to differences in the study population and the variable under study.

The results of various researches indicate the effectiveness of distance education, especially in the field of mental health services (32). Studies have documented that mothers need to increase their knowledge of pregnancy and COVID-19 to better understand risks and be more aware of their behavior (33). During the COVID-19 epidemic, distance education has decreased waiting times and service availability, thereby increasing the satisfaction of health care recipients (34). According to previous reports, women's self-care education and social support during pregnancy increase knowledge, improve self-care and reduce their perceived stress. In the present study, self-care training for pregnant women enabled them to experience less perceived anxiety and stress via rising awareness about coronavirus and reducing their false beliefs. Familiarity of pregnant mothers with reliable sources of information helped them manage their fears and anxieties by taking care of themselves through receiving answers to their questions and following the educational-health methods that have been proved effective in preventing the spread and infection of coronavirus. Communicating with trusted people through social media and talking about their concerns and feelings are helpful in this regard.

Limitations of this study were the use of self-administered method to complete the questionnaires and self-reporting in the telemedicine training group to ensure participation in the training. In this respect, the researcher tried to reduce the impact of this issue by following up when sending the content.

Conclusion

The results of our study confirmed the efficacy of the telemedicine Covid 19 self-care training program in reducing the perceived stress and anxiety of pregnant women during the coronavirus pandemic. Therefore, the use of this method is recommended in the care of pregnant women to alleviate stress and anxiety. Maybe it is the time to make changes to routine care and to take advantage of the opportunity of increasing community access to electronics in order to improve health services. It is suggested that studies be conducted on the effectiveness of telemedicine training on physical, mental and

social health of women in post-partum and post-abortion period.

Acknowledgements

This study was supported by Zahedan University of Medical Sciences, Zahedan, Iran. The authors appreciate the research and health assistance of Zahedan University of Medical Sciences. We thank the management and staff of Comprehensive health centers as well as the subjects for their participation. The paper is taken from MSc Thesis of Motahhare Hashemzahi graduated from Zahedan University of Medical Sciences, Zahedan, Iran.

Conflicts of interest

Authors declared no conflicts of interest.

References

1. Madhavanprabhakaran GK, D'Souza MS, Nairy KS. Prevalence of pregnancy anxiety and associated factors. *International Journal of Africa Nursing Sciences*. 2015; 3: 1-7.
2. Zareipour M, Sadeghianifar A, Amirzehni J, Parsnezhad M, Ayuoghi Rahnama V. Exploring of depression, anxiety and stress in pregnant women referred to health centers of Urmia. *Rahavard Salamat Journal*. 2018; 3(2): 19-30.
3. Fakari FR, Simbar M. Coronavirus pandemic and worries during pregnancy; a letter to editor. *Archives of academic emergency medicine*. 2020; 8(1): e21-e.
4. Mogos MF, August EM, Salinas-Miranda AA, Sultan DH, Salihu HM. A systematic review of quality of life measures in pregnant and postpartum mothers. *Applied research in quality of life*. 2013; 8(2): 219-250.
5. Benke C, Autenrieth LK, Asselmann E, Pané-Farré CA. Lockdown, quarantine measures, and social distancing: Associations with depression, anxiety and distress at the beginning of the COVID-19 pandemic among adults from Germany. *Psychiatry Research*. 2020; 293: 113462.
6. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The lancet*. 2020; 395(10227): 912-920.
7. Lobie TA, Tesfaye D, Abrham A. A narrative synthesis on COVID-19 risks and concerns in developing countries: The case of Ethiopia. *Journal of Public Health and Epidemiology*. 2020; 12(2): 86-97.
8. Nosratabadi M, Sarabi N, Masoudiyekta L. A Case Report of Vaginal Delivery at Home due to Fear of Covid-19. *Iranian journal of psychiatry*. 2020;

- 15(4): 366.
9. Allahtavakoli M. Coping with stress of COVID_19 epidemic. *Journal of Jiroft University of Medical Sciences*. 2020; 7(1): 253-254.
 10. Khodayarifard M, Asayesh MH. Psychological coping strategies and techniques to deal with stress & anxiety around coronavirus (COVID-19). *Rooyesh-e-Ravanshenasi Journal (RRJ)*. 2020; 9(8): 1-18.
 11. Khadivzadeh T, Azhari S, Esmaily H, Akhlaghi F, Sardar MA. Effects of self-care education on perceived stress in women with gestational diabetes under insulin treatment. *Evidence Based Care*. 2015; 5(3): 7-18.
 12. Jamshidzahe Dejanje M, Kiani F, Tabatabaei SM, Tasbandi M. Effect of Orem's Self-Care Model Training Program on Anxiety of Women with Breast Cancer: A Clinical Trial Study. *Medical-Surgical Nursing Journal*. 2018; 7(2): e80605.
 13. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International journal of environmental research and public health*. 2020; 17(5): 1729.
 14. Liang H, Acharya G. Novel corona virus disease (COVID-19) in pregnancy: What clinical recommendations to follow. *Acta Obstetrica et Gynecologica Scandinavica*. 2020; 99(4): 439-442.
 15. Soleiman EY, Majlessi F, Rahimi FA. Measurement of the Constructs of Health Belief Model Related to Self-care during Pregnancy in Women Referred to South Tehran Health Network. *Community Health*. 2015; 1(2): 89-98.
 16. Masjoudi M, Aslani A, Khazaeian S, Fathnezhad-Kazemi A. Explaining the experience of prenatal care and investigating the association between psychological factors with self-care in pregnant women during COVID-19 pandemic: a mixed method study protocol. *Reproductive health*. 2020; 17(1): 1-7.
 17. Amini A, Peyman A, Hatami M. Effect of Self-Care Education Based on Virtual Networks on Quality of Life in HIV-Positive Patients. *Journal of Education and Community Health*. 2020; 7(3): 203-211.
 18. Organization WH. Maintaining essential health services: operational guidance for the COVID-19 context: interim guidance, 1 June 2020: World Health Organization; 2020. Available from: <https://apps.who.int/iris/handle/10665/332240>
 19. Daryazadeh S. Necessity of E-learning application and its effectiveness in self-patients' care. *Razi Journal of Medical Sciences*. 2016; 23(149): 9-17.
 20. García-Lizana F, Muñoz-Mayorga I. Telemedicine for depression: a systematic review. *Perspectives in psychiatric care*. 2010; 46(2): 119-126.
 21. Zork NM, Aubey J, Yates H, editors. Conversion and optimization of telehealth in obstetric care during the COVID-19 pandemic. *Seminars in Perinatology*; 2020: Elsevier. 2020; 44(6): 151300.
 22. Krenitsky NM, Spiegelman J, Sutton D, Syeda S, Moroz L, editors. Primed for a pandemic: Implementation of telehealth outpatient monitoring for women with mild COVID-19. *Seminars in Perinatology*; 2020: Elsevier. 2020; 44(7): 151285.
 23. Wu H, Sun W, Huang X, Yu S, Wang H, Bi X, et al. Online antenatal care during the COVID-19 pandemic: opportunities and challenges. *Journal of medical Internet research*. 2020; 22(7): e19916.
 24. Cho Y, Lee S, Islam S, Kim S. Theories applied to m-Health interventions for behavior change in low-and middle-income countries: a systematic review. *Telemedicine journal and e-health*. 2018; 24 (10): 727-741. doi: 10.1089/tmj.2017.0249.
 25. Derya YA, Altiparmak S, Emine A, GÖkbulut N, Yilmaz AN. Pregnancy and birth planning during COVID-19: the effects of tele-education offered to pregnant women on prenatal distress and pregnancy-related anxiety. *Midwifery*. 2021; 92: 102877. doi: 10.1016/j.midw.2020.102877.
 26. Alipour A, Ghadami A, Alipour Z, Abdollahzadeh H. Preliminary validation of the Corona Disease Anxiety Scale (CDAS) in the Iranian sample. *Quarterly Journal of Health Psychology*. 2020; 8(32): 163-175.
 27. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of health and social behavior*. 1983; 24(4): 385-396.
 28. Hasan Zadeh LifShagard M, Tarkhan M, Taghi Zadeh ME. Effectiveness of stress inoculation training on perceived stress in pregnant women with infertility. *Journal of Holistic Nursing And Midwifery*. 2013; 23(2): 27-34.
 29. Ganjali F. The effect of distance education on mothers' anxiety and stress about delivery method in nulliparous mothers. 1 International and 3rd National Conference on Management and Humanistic Science Research Tehran. 2017: 1-18. <https://www.sid.ir/fa/seminar/ViewPaper.aspx?ID=91826>
 30. Shabani MM. The Effectiveness of Distance Learning Package Prevention of Covid-19 Disease (Virus SARS-CoV-2) on Reducing phobia and Anxiety of Covid 19 Disease)(Corona-Novin Virus 2019) in Virtual English Language Learners-Pilot Study Malahat Shabani minaabad IASP. *Journal of Iranian Society Anaesthesiology and Intensive Care*. 2020; 2(108): 58-68.
 31. Sharifzadeh M, Davarinia Motlagh Quchan A,

- Mohamadzadeh Tabrizi Z, Navi Nezhad M. The effectiveness of self-care virtual education related to Covid 19 disease on life expectancy of pregnant mothers. *Iranian Journal of War and Public Health*. 2020; 12(4): 207-212.
32. Zhou X, Snoswell CL, Harding LE, Bambling M, Edirippulige S, Bai X, et al. The role of telehealth in reducing the mental health burden from COVID-19. *Telemedicine and e-Health*. 2020; 26(4): 377-379.
33. Rezaei F, Masaeli Z, Atighechian G. Information Needs of Pregnant Women in the COVID-19 Pandemic from Experts' Point of View: A Qualitative Study. *International Journal of Community Based Nursing and Midwifery*. 2021; 9(2): 139-151.
34. Poitras M-E. Chronic disease patients' experience with telehealth interventions and self-care strategies during the first wave of the COVID-19 pandemic. 2021: 1-25.