Does telecounseling reduce anxiety and depression during pregnancy? A randomized controlled trial

Emine Koc[1]* , Nazlı Baltaci[2] , Sümeyye Bal[1]

SUMMARY

OBJECTIVE: This study aims to examine the effect of telecounseling in reducing the anxiety and depression experienced by pregnant women.
METHOD: This randomized control trial was conducted on 100 pregnant women (50 in each intervention and control group). The intervention group received telecounseling with regard to the mother and the fetus as needed between 08:00 h and 20:00 h for 6 weeks at home. The control group received only routine care. Anxiety and depression levels were evaluated at the beginning and end of the study using the Hospital Anxiety Depression Scale.
RESULTS: Anxiety and depression levels were found to be lower in the intervention group than in the control group (p<0.001). In the control group, the anxiety score increased from 5.62 to 7.16, and the depression score increased from 4.92 to 5.76 without any intervention (p<0.001).
CONCLUSION: This study shows that telecounseling may have an effect on reducing the level of anxiety and depression of pregnant women.
KEYWORDS: Anxiety. Depression. Pregnancy. Telemedicine.

INTRODUCTION

Pregnancy is a unique process in which physiological, social, and psychological changes occur in a woman's life. During pregnancy, most women experience anxiety and depression, both of which are important global health problems[1-3]. Worldwide, the prevalence of anxiety and depression during pregnancy ranges from 6.0 to 57.0% and 8.5 to 44.4%, respectively; however, these rates are considerably higher in underdeveloped and developing countries[3-7]. If anxiety and/or depression cannot be controlled during pregnancy, many problems such as preterm birth, prenatal infections and diseases, low birth weight, lower Apgar scores at birth, postpartum depression, and later childhood emotional difficulties may be encountered[4,7-9]. Therefore, prevention, early recognition, and controlling anxiety and/or depression during pregnancy help protect the health of the mother and fetus. Midwives and nurses can contribute to the reduction of anxiety and/or depression by fulfilling the roles of care, education, and counseling during pregnancy[7].

In the 21st century, phone-based applications have become an effective method for reducing anxiety and depression[10]. These applications are fast, flexible, and accessible[10-12]. In a systematic review, it was determined that telecounseling was effective in reducing problems such as stress, anxiety, and depression; however, no studies focusing on pregnant women were found[13]. The authors of that study recommended increasing the use of telecounseling with the advances in technology today and studies conducted on this subject[13]. The problem of having enough personnel needed to provide adequate health care in the face-to-face healthcare system can be solved by telecounseling; thus, telecounseling can indirectly help solve labor problems[10]. Concurrently, providing remote counseling has positive aspects such as increasing efficiency by reducing hospital and transportation costs, saving time, and providing access to information at any time[13]. There is no study in Turkey that examines the effect of pregnancy-specific telecounseling on anxiety and depression levels. Therefore, the results of this study will make an important contribution to the literature with data from a developing country. This study was performed to examine the effect of telecounseling provided 24/7 in reducing the anxiety and depression experienced by pregnant women before childbirth.

METHODS

Study design and location

This research was designed as a randomized controlled trial with a parallel group pre-test-post-test design. The study was

conducted in accordance with the CONSORT guidelines. The study is registered on clinicaltrials.gov (ClinicalTrials.gov Identifier: NCT05214846). The study was conducted between January 25, 2021 and January 05, 2022, in the obstetric outpatient clinics of a public hospital in northern Turkey.

Sample size and characteristics

Sample size was determined based on a similar study in the literature[14]. Power analysis was performed with effect size d=0.81, a confidence interval of 0.95 (1-β), 0.05 alpha error rate, 0.95 power, and d=0.87 effect size. Accordingly, the minimum sample size was calculated as 68 participants (34 pregnant women in each group). Considering possible data loss, a total of 100 pregnant women, 50 in each group, were included in the study. Healthy pregnant women aged >18 years who had not been diagnosed with any psychiatric disease, had no mental and communication problems, were in their 3rd trimester (between 28th and 32nd gestational weeks), were nulliparous, and had no fetal anomalies and risky pregnancy were included in the study. Those who did not meet the inclusion criteria were excluded from the study.

Data collection tools

The introductory information form developed by the researchers in line with the relevant literature consists of 20 items[3-5,7,9]. The form contains questions related to the socio-demographic characteristics and obstetric histories of pregnant women.

Hospital anxiety depression scale (HADS): HADS was developed by Zigmond and Snaith in 1983 to determine the risk group by scanning for anxiety and depression in those with physical illness[15]. HADS is a self-assessment scale used for screening purposes but not for diagnosis. The scale can also be used to screen for anxiety and depression in the general healthy population and pregnant women[16]. The scale consists of 14 items, seven of which measure anxiety, and the other seven measure depression symptoms. A 4-item Likert scale with a scoring system between 0 and 3 is used. The minimum score obtained from the scale is 0, and the maximum score is 21[15]. Turkish validity and reliability study of HADS was conducted by Aydemir et al.[17]. Cronbach's alpha reliability coefficient of the scale was 0.8525 for the anxiety dimension and 0.7784 for the depression dimension. In this study, Cronbach's alpha reliability coefficient was 0.714 for the anxiety sub-dimension and 0.770 for the depression sub-dimension.

Randomization

Randomization was performed by the researchers with the Quickcalcs graph pad (http://www.graphpad.com/quickcalcs/, date: 18.01.2021).

Collection of data

After the consent of all pregnant women was obtained, and randomization was performed, the sociodemographic and obstetric characteristics and anxiety depression levels were determined via the pre-test. Routine care in both groups continued without any interference during the study period.

Control group: This group only received routine care in the hospital. Six weeks after the pre-test (introductory information form, HADS), participants were contacted telephonically, and the post-test (HADS) was applied.

Intervention group: The day after the pre-test, participants were contacted telephonically and encouraged to ask all questions. The intervention group received telecounseling between 08:00 h and 20:00 h for 6 weeks at home. Counseling included topics related to the mother and the fetus. In cases that required treatment or care for problems that could not be solved by phone, participants were directed to the obstetric outpatient clinic to continue the process. In total, 265 interviews were conducted with 50 pregnant women. Average time for phone calls was 13 min. Post-test was applied to the intervention group when telecounseling was terminated after 6 weeks.

Evaluation of data

To test the relationship between the categorical variables, we applied chi-square-based hypothesis tests. For nominal variables, we used chi-square independence tests and Fisher's exact tests. We carried out independent-samples t-test to compare the anxiety and depression scores between the intervention and control groups. Also, we implemented a paired-samples t-test to compare the pre-post anxiety and depression scores for each intervention and control group.

Ethics

Ethical permission (31.12.2020, decision no. 2020/737, B.30.2.ODM.0.20.08/868) was obtained from a University Clinical Research Ethics Committee, and necessary permissions were also obtained. HADS scale permission was obtained.

RESULTS

Table 1 shows that the groups are sociodemographically similar, and there is no significant difference between the groups. Participants' age, age during marriage, educational status, employment status, level of income, health insurance and family type, and smoking use are similar (p>0.05).

Table 2 shows that the groups are obstetrically similar, and there is no significant difference between the groups. Participants' gestational week, number of pregnancies, abortions, prenatal

educational status, education place, and pregnancy planning status are similar (p>0.05). All the participants (n=100) had wanted pregnancy.

Table 3 shows the comparison of the HADS scores between and within groups. Examination of inter-group differences revealed the presence of a significant difference between the anxiety pre-test scores of the intervention and control groups (p<0.001). However, no significant difference was found between the depression pre-test scores (p=0.169). Post-test anxiety and depression scores were significantly different between the intervention and the control groups (p<0.001). Accordingly, anxiety and depression levels were lower in the intervention group than in the control group.

Examination of intra-group differences revealed that the anxiety score of the intervention group before telecounseling was 7.62, while it was decreased to 5.26 after counseling (p<0.001). Similarly, although the depression score of the intervention group was 5.50 before telecounseling, it decreased to 3.52 after counseling (p<0.001). Accordingly, it was determined that the anxiety level increased by 2.36 points (p<0.001) and the depression level decreased by 1.98 points (p<0.001). In the control group, the anxiety score increased from 5.62 to 7.16 without any intervention (p<0.001). Similarly, the depression score increased from 4.92 to 5.76 without any intervention (p<0.001). Accordingly, it was determined that the anxiety level increased by 1.54 points (p<0.001) and the depression level increased by 0.84 points, but there was no significant difference (p>0.05).

DISCUSSION

According to the results of the study, anxiety and depression levels were found to be lower in the intervention group than in the control group (p<0.001). In the intervention group, the anxiety score decreased from 7.62 points to 5.26 points after telecounseling (p<0.001). Similarly, the depression score

Table 1. Sociodemographic characteristics between the groups.

Variable	Intervention group (n=50)	Control group (n=50)	p-value
Age (years)	25.50±3.86	25.46±4.72	0.963[IT]
Marriage age	24.10±3.78	24.14±6.70	0.971[IT]
Educational status			
Primary and secondary school	9 (18)	22 (44)	
High school	28 (56)	13 (26)	0.154[L]
University	13 (26)	15 (30)	
Employment status			
Employed	37 (74)	40 (80)	
Unemployed	8 (16)	5 (10)	0.667[c]
On leave	5 (10)	5 (10)	
Level of income			
Income lower than expense	20 (40)	9 (18)	
Income equal to expense	24 (48)	39 (78)	0.222[L]
Income higher than expense	6 (12)	2 (4)	
Health insurance			
Present	44 (88)	48 (96)	0.142[F]
Absent	6 (12)	2 (4)	
Family type			
Nuclear	44 (88)	43 (76)	0.88[c]
Extended	6 (12)	7 (14)	
Smoking use			
Present	4 (8)	3 (6)	1.000[F]
Absent	46 (92)	47 (94)	

Categorical variables are presented as n (%) and continuous variables as mean (SD). [IT]Independent-samples t-test; [c]Chi-square test; [F]Fisher's exact test; [L]Linear-by-linear association test.

decreased from 5.50 to 3.52 (p<0.001). This result showed that telecounseling is an effective method of reducing the level of anxiety and depression in pregnant women. Furthermore, a randomized controlled trial showed that post-traumatic stress disorder, depression, and anxiety symptoms of women experiencing traumatic childbirth after birth decreased within 72 h, and in some cases, extended up to 4–6 weeks in the intervention group that received midwife-led brief counseling; however, no immediate change was observed in the control group and anxiety, depression, and stress levels started to decrease after 3 months[18]. In a descriptive study conducted on pregnant women who did not have access to regular antenatal services, approximately 96.43% of pregnant women felt that telemedicine alleviated depression, anxiety, and stress during pregnancy. Concurrently, it was stated that the participants immediately agreed to be contacted telephonically[19]. In this study, it was observed that the participants immediately accepted to participate in the study and recommended it to their relatives.

Prenatal anxiety and depression lead to many complications in the mother and the child. Furthermore, children of mothers who experience high stress during pregnancy are more likely to have cognitive and behavioral problems and are at a higher risk for mental health problems in the future[5,20,21]. The results of this study suggest that telecounseling can be an important practice to prevent these complications, especially in countries with low economic status. In fact, the anxiety level increased from 5.62 to 7.16 points (p<0.001) and the depression level increased from 4.92 to 5.76 in the control group without any intervention; however, the difference was not significant (p>0.05). Despite the absence of intervention in the control group, the significant increase in anxiety in the 6-week period between the pre-test and the post-test may be attributable to the progression of pregnancy and approaching childbirth. The anxieties related to the approaching birth and the neonate, limitation of movement, and other physical symptoms that increase with the progression of the pregnancy reportedly decrease the quality of life and increase the anxiety levels by affecting pregnant women mentally[22]. In such circumstances, having the right information from reliable specialists at any given time relaxes the expecting mothers and keeps them informed about the birth process while reducing their anxiety. According to the results of a meta-analysis, anxiety and depression were more common in nulliparous pregnancies and in low- and middle-income

Table 3. Comparison of the Hospital Anxiety Depression Scale scores between and within groups.

Anxiety	Intervention group (n=50)	Control group (n=50)	Between groups p-value
Pre-test	7.62 (3.16)	5.62 (2.64)	<0.001[IT]
Post-test	5,26 (2.65)	7.16 (2.88)	<0.001[IT]
Within group p-value	<0.001[PST]	<0.001[PST]	
Difference	-2.36 (2.30)	1.54 (2.17)	
Depression			
Pre-test	5.50 (3.13)	4.92 (2.89)	0.169[IT]
Post-test	3.52 (2.85)	5.76 (2.78)	<0.001[IT]
Within group p-value	<0.001[PST]	0.08[PST]	
Difference	-1.98 (2.09)	0.84 (2.40)	

[IT]Independent-samples t-test; [PST]Paired-samples t-test.

Table 2. Obstetric outcomes between the groups.

Variable	Intervention group (n=50)	Control group (n=50)	p-value
Gestational week	32.34±2.17	32.32±2.14	0.963[IT]
Number of pregnancies	1.16±0.865	1.1±0.505	0.673[IT]
Number of abortions	0.16±0.865	0.6±0.313	0. 444[IT]
Participation in educational status			
Attended	22 (44)	19 (38)	0.542[c]
Did not attend	28 (56)	31 (76)	
Where she studied			
Health care personnel	4 (8)	5 (10)	0.621[F]
Internet	15 (30)	9 (18)	
Family/relative	4 (8)	4 (8)	
Pregnancy type			
Planned	47 (94)	48 (96)	1.000[F]
Not planned	3 (6)	2 (4)	

Categorical variables are presented as n (%) and continuous variables as mean (SD). [IT]Independent-samples t-test; [c]Chi-square test; [F]Fisher's exact test.

countries[4]. Therefore, telecounseling, which is a cost-effective method, can be recommended to address these issues.

CONCLUSION

The results of this study showed that telecounseling was effective in reducing the level of anxiety and depression in pregnant women. Furthermore, it was found that when no intervention was made, depression and anxiety levels of pregnant women increased as pregnancy progressed. When taking these results into account, telecounseling by health care professionals may be a viable cost-effective method, especially in low-income countries, places where access to health care is difficult.

Limitations

Owing to its single-centered nature, the results cannot be generalized to all healthy pregnant women.

ETHICS

Ethical permission was obtained from Ondokuz Mayıs University Clinical Research Ethics Committee (31.12.2020, decision no. 2020/737, B.30.2.ODM.0.20.08/868), and necessary permissions were obtained from the institution where the study was conducted.

AUTHORS' CONTRIBUTIONS

EK: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology , Project administration, Resources, Software, Validation, Visualization Writing – original draft, Writing – review & editing. **NB:** Conceptualization, Funding acquisition, Investigation, Methodology, Resources, Software, Validation, Writing – review & editing. **SB:** Data curation, Funding acquisition, Investigation, Resources, Software, Validation, Writing – review & editing.

REFERENCES

1. González-Mesa E, Kabukcuoglu K, Körükcü O, Blasco M, Ibrahim N, Cazorla-Granados O, et al. Correlates for state and trait anxiety in a multicultural sample of Turkish and Spanish women at first trimester of pregnancy. J Affect Disord. 2019;249:1-7. https://doi.org/10.1016/j.jad.2019.01.036

2. Ghaffar R, Iqbal Q, Khalid A, Saleem F, Hassali MA, Baloch NS, et al. Frequency and predictors of anxiety and depression among pregnant women attending tertiary healthcare institutes of Quetta City, Pakistan. BMC Womens Health. 2017;17(1):51. https://doi.org/10.1186/s12905-017-0411-1

3. Ma X, Wang Y, Hu H, Tao XG, Zhang Y, Shi H. The impact of resilience on prenatal anxiety and depression among pregnant women in Shanghai. J Affect Disord. 2019;250:57-64. https://doi.org/10.1016/j.jad.2019.02.058

4. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. Br J Psychiatry. 2017;210(5):315-23. https://doi.org/10.1192/bjp.bp.116.187179

5. Lebel C, MacKinnon A, Bagshawe M, Tomfohr-Madsen L, Giesbrecht G. Elevated depression and anxiety symptoms among pregnant individuals during the COVID-19 pandemic. J Affect Disord. 2020;277:5-13. https://doi.org/10.1016/j.jad.2020.07.126

6. Corbett GA, Milne SJ, Hehir MP, Lindow SW, O'connell MP. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. Eur J Obstet Gynecol Reprod Biol. 2020;249:96-7. https://doi.org/10.1016/j.ejogrb.2020.04.022

7. Domínguez-Solís E, Lima-Serrano M, Lima-Rodríguez JS. Non-pharmacological interventions to reduce anxiety in pregnancy, labour and postpartum: a systematic review. Midwifery. 2021;102:103126. https://doi.org/10.1016/j.midw.2021.103126

8. Loughnan SA, Sie A, Hobbs MJ, Joubert AE, Smith J, Haskelberg H, et al. A randomized controlled trial of 'MUMentum Pregnancy': internet-delivered cognitive behavioral therapy program for antenatal anxiety and depression. J Affect Disord. 2019;243:381-90. https://doi.org/10.1016/j.jad.2018.09.057

9. Grigoriadis S, Graves L, Peer M, Mamisashvili L, Tomlinson G, Vigod SN, et al. Maternal anxiety during pregnancy and the association with adverse perinatal outcomes: systematic review and meta-analysis. J Clin Psychiatry. 2018;79(5):17r12011. https://doi.org/10.4088/JCP.17r12011

10. Walker SB, Rossi DM, Sander TM. Women's successful transition to motherhood during the early postnatal period: a qualitative systematic review of postnatal and midwifery home care literature. Midwifery. 2019;79:102552. https://doi.org/10.1016/j.midw.2019.102552

11. Bikmoradi A, Masmouei B, Ghomeisi M, Roshanaei G, Masiello I. Impact of telephone counseling on the quality of life of patients discharged after coronary artery bypass grafts. Patient Educ Couns. 2017;100(12):2290-6. https://doi.org/10.1016/j.pec.2017.06.010

12. Sharmila V, Babu TA, Balakrishnan P. Optimizing telemedicine for providing obstetric and reproductive health care services during COVID-19 pandemic. Int J Community Med Public Health 2020;7:3278-83. https://doi.org/10.18203/2394-6040.ijcmph20203414

13. Özdemir EA, Örsal Ö. Investigation of the effect of tele-nursing practice in nursing thesis in turkey: a systematic review. Turkiye Klinikleri J Nurs Sci. 2020;12(4):607-15. https://doi.org/10.5336/nurses.2020-73609

14. Heller HM, Hoogendoorn AW, Honig A, Broekman BFP, Straten A. The Effectiveness of a guided internet-based tool for the treatment of depression and anxiety in pregnancy (MamaKits Online): randomized controlled trial. J Med Internet Res. 2020;22(3):e15172. https://doi.org/10.2196/15172

15. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-70. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

16. Luna D, Castañeda-Hernández DV, Guadarrama-Arteaga AL, Figuerola-Escoto RP, García-Arista A, Ixtla-Pérez MB, et. al. Psychometric properties of the hospital anxiety and depression scale in mexican pregnant women. Salud mental. 2020;43(3):137-46. https://doi.org/10.17711/sm.0185-3325.2020.019

17. Aydemir Ö, Güvenir T, Küey L, Kültür S. Reliability and validity of the turkish version of hospital anxiety and depression scale. Turkish J Psychiatry. 1997;8:280-7.

18. Asadzadeh L, Jafari E, Kharaghani R, Taremian F. Effectiveness of midwife-led brief counseling intervention on post-traumatic stress disorder, depression, and anxiety symptoms of women experiencing a traumatic childbirth: a randomized controlled trial. BMC Pregnancy Childbirth. 2020;20(1):142. https://doi.org/10.1186/s12884-020-2826-1

19. Acriche NM, Uyheng GI. Depression, anxiety, and stress levels in pregnant women who do not have access to regular antenatal services due to existing COVID-19 community quarantine measures and their perception on telemedicine. Philipp J Obstet Gynecol 2021;45(3):87-96. https://doi.org/10.4103/pjog.pjog_22_21

20. Qu F, Wu Y, Zhu YH, Barry J, Ding T, Baio G, et al. The association between psychological stress and miscarriage: a systematic review and meta-analysis. Sci Rep. 2017;7(1):1731. https://doi.org/10.1038/s41598-017-01792-3

21. MacKinnon N, Kingsbury M, Mahedy L, Evans J, Colman I. The association between prenatal stress and externalizing symptoms in childhood: evidence from the avon longitudinal study of parents and children. Biol Psychiatry. 2018;83(2):100-08. https://doi.org/10.1016/j.biopsych.2017.07.010

22. Kaya Zaman F, Özkan N, Toprak D. Depression and anxiety in pregnancy. Konuralp Med J. 2018;10(1):20-5. https://doi.org/10.18521/ktd.311793