JOURNAL OF
CONTEMPORARY MEDICINE

DOI: 10.16899/jcm.824405
J Contemp Med 2021;11(3):346-351

Orjinal Araştırma / Original Article

Anxiety And Depression Levels In Individuals With Twin Pregnancy

İkiz Gebeliği Olan Bireylerde Anksiyete ve Depresyon Düzeyleri

Eda Ferahkaya[1], Melike Geyik Bayman[2]

[1]University of Health Sciences, Konya Training and Research Hospital, Department of Psychiatry, Konya, Turkey
[2] University of Health Sciences, Konya Training and Research Hospital, Department of Obstetrics and Gynecology, Konya, Turkey

Abstract

Objective: The aim of this study was to compare the anxiety and depression levels of women with twin pregnancies and women with singleton pregnancy without using assisted reproduction technique.

Material and Method: Thirty-six women with twin pregnancies and between 30-34 weeks of gestation were included in the study. Thirty-five women with single pregnancy were included as a control group. Sociodemographic data form and the Hospital Anxiety Depression Scale (HADS) were applied to both groups by evaluating them by the psychiatrist. The sociodemographic characteristics and HADS scores of women with twin and singleton pregnancy were compared.

Results: When women with twin pregnancies were compared with women with single pregnancies, no significant difference was found between the two groups in terms of age, educational status, employment status, economic status and miscarriage, while gravida and number of children were significantly different between the two groups. When the HADS scale scores were evaluated, it was found to be that the levels of anxiety and depression were significantly higher in twin pregnancies.

Conclusions: Based on the present clinical results, it was found that the levels of anxiety and depression are higher in women with spontaneous twin pregnancy compared to single pregnancy.

Keywords: Twin pregnancy, anxiety, depression

Öz

Amaç: Bu çalışmada yardımcı üreme tekniği kullanılmadan ikiz gebeliği olan kadınlar ile tekil gebeliği olan kadınların anksiyete ve depresyon düzeylerinin karşılaştırılması amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya gebeliğin 30-34. Haftaları arasında 36 ikiz hasta ve kontrol grubu olarak 35 tekil gebeliği olan kadın dahil edilmiştir. Her iki grup ile psikiyatrist tarafından değerlendirmeleri yapılarak sosyodemografik veri formu ve Hastane Anksiyete Depresyon Ölçeği (HADS) uygulanmıştır. İkiz ve tekil gebeliği olan kadınların sosyodemografik özellikleri ve HADS skorları karşılaştırılmıştır.

Bulgular: İkiz gebeliği olan kadınlar tekil gebeliği olan kadınlar ile karşılaştırıldığında yaş,eğitim durumu, çalışma durumu, ekonomik durum ve düşük öyküsü iki grup arasında anlamlı bir farklılık saptanmazken, gravida ve çocuk sayısı iki grup arasında anlamlı olarak farklıdır. HADS ölçek skorları değerlendirildiğinde ikiz gebeleri olanlarda anksiyete ve depresyon düzeyleri anlamlı olarak yüksek saptanmıştır.

Sonuç: Mevcut klinik bulgular ile spontan ikiz gebeliği olan kadınlarda anksiyete ve depresyon düzeylerinin tekil gebeliğe oranla daha yüksek olduğunu saptanmıştır. Anahtar kelimeler: ikiz gebelik, anksiyete, depresyon

Anahtar Kelimeler: İkiz gebelik, anksiyete, depresyon

Corresponding *(İletişim)*: Eda Ferahkaya, University of Health Sciences, Konya Training and Research Hospital, Department of Psychiatry, Konya, Turkey
E-mail *(E-posta)*: dredaferahkaya@gmail.com
Received *(Geliş Tarihi)*: 11.11.2020 **Accepted *(Kabul Tarihi)*:** 22.03.2021

INTRODUCTION

Incidence of mental disorders and their clinical manifestations vary by gender. Presence of periods like menarche, menstruation, pregnancy and menopause in a woman's life during which significant alterations in gonadal hormones that have several effects on central nervous system, particularly on neurotransmitter functions, occur is thought to be among the factors increasing vulnerability to psychiatric disorders.[1] The period in women when mental disorders are the most common is the reproductive period between 18-45 years of age. Psychiatric disorders may not only occur for the first time during pregnancy or postpartum period, but also clinical presentation of a pre-existing disorder may differ. The most common psychiatric disorders observed during this period are depression and anxiety disorders.[2]

Several physiological, psychological and social changes occur during pregnancy and process of delivery in women. If an expectant mother fails to appropriately cope with the problems that arise as a result of these alterations, many problems may be encountered during pregnancy, delivery and postpartum period.[3] Symptoms of depression and anxiety, as well as somatic complaints are thought to result from physical and hormonal changes of pregnancy, making the diagnostic process challenging. Rate of depression during pregnancy varies between 7 to 20%,[4] whereas rate of anxiety disorders are observed to be 9-30%.[5,6] Prenatal depression and anxiety are an important risk factor for postpartum depression.[7] Due to mental disorders, worsening quality of life and reduced functionality of a mother and domestic conflicts adversely affects physical and mental development of the fetus and mother-child relationship.[8]

Although there are studies on psychiatric disorders in reproductive women, there is a limited number of specific studies related to multiple pregnancy and perinatal psychiatric disorders. Although psychological effects of multiple pregnancies and deliveries have been studied, sample of majority of the studies is small and of descriptive type. Most of the studies conducted are studies for multiple pregnancies with assisted reproductive techniques (ART).[9]

Twin pregnancies account for approximately 1-2% of all pregnancies.[10] Due to several factors such as increased demands for care of more than one infant, sleep deprivation, more common sleep disruption, higher financial load, more severe social isolation and higher risk of neonatal and obstetric risks during prenatal period, risk of perinatal depression, anxiety and other psychiatric disorders may be higher, compared to parents of singleton infants.[11] Very little is known about incidence of depression and anxiety disorders in multiple pregnancies. Rates of clinically significant anxiety and depressive symptoms have not been appropriately compared between women with singleton and multiple pregnancy.[12] In a previous study, rate of depression during final trimester of pregnancy in mothers who had a multiple pregnancy and at least one child was 30%, whereas this rate was determined to be 6% in women with first and singleton pregnancy.[13] During perinatal period, depression or anxiety disorders may affect more than 25% of women who give multiple births.[14]

In this study, comparison of levels of anxiety and depression in individuals with twin pregnancy without ART with individuals with singleton pregnancy was aimed. To date, no study related to levels of anxiety and depression in those with twin- and singleton pregnancy without ART has been conducted.

MATERIAL AND METHOD

Participants of the study were comprised of women at 30-34 weeks of gestation who admitted to Konya Training and Research Hospital Department of Gynecology and Obstetrics. The study sample was comprised of consecutively admitted 36 female patients with twin pregnancy and, as the control group, 35 female patients with singleton pregnancy. Inclusion criteria for the groups were determined as being at 18-45 years of age, a volunteer and a primary school graduate. The exclusion criteria were determined as presence of an additional medical disease, history of previous or current diagnosis and treatment of a psychiatric disorder, presence of a severe pregnancy complication (plasenta previa, preeclampsia, diabetes mellitus etc.), use of ART, use of corticosteroids or psychotropic medications and history of a recent severe infection during pregnancy.

No intervention was made for the patients during this observational study. For the study, an ethics committee approval was obtained from Konya Chamber of Commerce Karatay University Faculty of Medicine Ethics Committee on 17.07.2020 with the decision number 2020/018. All participants were informed about the study and taken a written voluntary consent from each. The patient and control groups were evaluated by interviews structured by a psychiatrist and the sociodemographic data questionnaire was filled in; Hospital Anxiety and Depression (HAD) scale was completed by the patients.

Sociodemographic data questionnaire: It is the questionnaire prepared by the investigators by which age, gender, marital status, education, occupation, number of pregnancies, number of alive children, history of abortus and psychiatric history of the women included in the study were recorded.

SCID-I / CV (Structured Clinical Interview for DSM-IV/ Clinical Version): It is a structured interview scale performed by an interviewer, which investigates diagnosis of axis 1 mental disorders in accordance with DSM-IV (14). It has been adjusted in Turkish language, and reliability and validity studies have been performed.[15]

Hospital Anxiety and Depression Scale (HADS): It is a self-report scale that is prepared to screen signs of anxiety and depression in those with a physical disease.[8] HAD has been adjusted in Turkish language, and validity and reliability

studies were performed by Aydemir and colleagues.[9] In the 14-question test, 7 questions evaluate anxiety and 7 questions evaluate depression. In the Turkish version of the scale, the breakpoint was determined to be 7 for the depression subscale (HAD-D) and 10 for anxiety subscale (HAD-A).

Statistical Analysis

The data were analyzed by using Statistical Package for the Social Sciences (SPSS), version 22.0, for MacOs (SPSS Inc., Chicago, IL). For data extraction, mean ± standard deviation and median (minimum-maximum) were used. Whether numerical data exhibited normal distribution by groups was examined using visual (histogram graphics) and analytical (Kolmogorov Smirnov test) methods. When the relationship between numerical data exhibited normal distribution, they were examined with independent samples t-test and, when did not, with Mann-Whitney U test; relationships between categorical data were examined with Chi-square test. A $p<0.05$ was considered statistically significant.

RESULTS

In the study, 35 women with singleton pregnancy and 36 women with twin pregnancy were included. Mean age of the pregnant women with singleton pregnancy was 29.54 and of those with twin pregnancy was 28.17, with no significant difference determined between mean ages of the groups (p=0.327) (**Table 1**). When sociodemographic characteristics of the groups were examined, of the pregnant women with singleton pregnancy; 54.3% (n=19) were primary school graduate, 34.3% (n=12) high school graduate and 11.4% (n=4) postgraduate, whereas of those with twin pregnancy; 55.6% (n=20) were primary school graduate, 33.3% (n=12) high school graduate and 11.1% (n=4) postgraduate, and the difference was not determined to be statistically significant (p=0.994). 85.7% (n=30) of those with singleton pregnancy and %86.1% (n=31) of those with twin pregnancy were unemployed and the difference was not determined to be significant (p=0.962). As all participants were married, it could not be evaluated as a variable. When the financial status was evaluated, in the group of singleton pregnancy, 2.9% (n=1) had poor, 68.6% (n=24) moderate and 28.6% (n=10) favorable financial status, whereas in those with twin pregnancy, 2.8% (n=1) had poor, 61.1% (n=22) moderate and 36.1% (n=13) favorable financial status, and the difference was not statistically significant (p=0.793). Of those with singleton pregnancy; 20% (n=7) were primigravid and 80% (n=28) multigravid, whereas of those with twin pregnancy; 41.7% (n=15) were primigravid, 58.3% (n=21) were multigravid, and the difference was determined to be statistically significant (p=0.046). 48.6% of those with singleton pregnancy had history of abortus, whereas this ratio was 33.3% (n=12) in those with twin pregnancy, and this ratio was not statistically significant (p=0.192). Sociodemographic and obstetric characteristics of the participants are represented in **Table 1**.

Table 1. Sociodemographic and obstetric characteristics of the participants

	Singleton Pregnancy		Twin Pregnancy		
	Mean ±SS		Mean±SS		p
Age	29.54 ± 5.39		28.17 ± 4.71		0.327
Number of child	1.06±0.80		0.47±0.65		<0.001
	n	%	n	%	
Education					**0.994**
Primary School	19	54.3%	20	55.6%	
High School	12	34.3%	12	33.3%	
University	4	11.4%	4	11.1%	
Employment Status					**0.962**
Employed	30	85.7%	31	86.1%	
Unemployed	5	14.3%	5	13.9%	
Financial Status					**0.793**
Poor	1	2.9%	1	2.8%	
Moderate	24	68.6%	22	61.1%	
Favorable	10	28.6%	13	36.1%	
Gravida					**0.046**
Primigravid	7	20.0%	15	41.7%	
Multigravid	28	80.0%	21	58.3%	
History of Abortus					**0.192**
Yes	17	48.6%	12	33.3%	
Yes	18	51.4%	24	66.7%	

Chi-Square test was used.

HAD-anxiety, HAD-depression and HAD-total scores of those with and without twin pregnancy are shown in **Table 2**. Mean score of HAD-anxiety score was 3.14±2.28 in the group with single pregnancy and 6.17±3.71 in those with twin pregnancy. mean score of HAD-depression score was 3.34±2.45 in the group with single pregnancy while it was 6.64±3.47 in the group with twin pregnancy. HAD-total score was 6.49±4.31 in the group with single pregnancy and 12.81±6.11 in those with twin pregnancy. When compared, the difference between both groups was statistically significant ($p<0.001$ for all 3 values). When the number of children were compared, both groups were determined to significantly differ ($p<0.001$).

Table 2. Comparison of age, number of children and HAD Scale

	Singleton pregnancy	Twin pregnancy	
	Mean±SS	Mean±SS	p
HAD-A	3.14±2.28	6.17±3.71	<0.001
HAD-D	3.34±2.45	6.64±3.47	<0.001
HAD-Total	6.49±4.31	12.81±6.11	<0.001

HAD-A: Hospital Anxiety and Depression Scale-Anxiety, HAD-D: Hospital Anxiety and Depression Scale-Depression, Mann-Whitney U test was used.

DISCUSSION

At the beginning, uncertainty about pregnancy, physical changes, concerns about health and development of fetus, social withdrawal close to delivery, concerns about delivery preparations and infant's care, changes in lifestyle that may occur during delivery and postnatal period, and anxiety of coping with these situations are possible and normal,

particularly in first pregnancy. These processes may lead to mental changes. Reason of these mental changes may be associated with hormonal changes that occur during adaptation to pregnancy or during pregnancy. Although the change and adaptation to the change observed in mental conditions following life events are considered normal, the theoretical evaluation of to what extent should mental changes observed in the perinatal period be considered as a part of normal process continues. There has recently been evidence that women's mental health may be affected by changes in the reproductive cycle and that psychiatric disorders may occur for the first time in some women. The discussion on whether the psychiatric disorders that occur during pregnancy or postnatal period are clinically different from those observed during other phases of the life cycle and on relative etiological contributions of biological and psychosocial factors still continues.[9]

Anxiety and depressive symptoms occur during pregnancy in at least one third of women. The symptoms are usually observed together. More common recognition of depressive symptoms and anxiety in women in developing countries is due to more lifestyle changes in women during pregnancy.[16]

There are a small number of studies investigating effect of multiple pregnancies on mothers' prenatal mental health. In a study conducted with women with twin pregnancy, it was concluded from high rates of anxiety and depression reported while comparing experiences of the mothers on singleton- and multiple pregnancy. It is noteworthy that 42% of those with multiple pregnancy showed severe anxiety (three times higher than singleton pregnancy) and 29.7% showed severe depression (five times higher than singleton pregnancy).[17]

In a study by Vilska and colleagues in which twin- and singleton pregnancies with and without ART were included, no difference was determined in level of anxiety during second trimester in twin- and singleton pregnancy.[18] In contrast, there are studies reporting higher levels of anxiety during prenatal period.[19,20] It was reported that, when HAD scale results at 18 and 28 weeks of gestation in pregnant women with twin, triplet and singleton pregnancy with ART and those with singleton pregnancy without treatment for infertility were compared, the level of anxiety was determined to be 31% in women with multiple pregnancy with ART, 19% in those with singleton pregnancy with ART and 13% in those with singleton pregnancy without ART, whereas level of anxiety at 28 weeks of gestation of women with twin pregnancy with ART was higher compared to both groups.[19] In our study, when those with multiple- and singleton pregnancy without treatment for infertility were compared at 30-34 weeks of gestation, level of anxiety was determined to be higher in those with multiple pregnancy. While more common depressive symptoms at 28 weeks of gestation were determined in women with twin- or triplet pregnancy with ART compared to those with singleton pregnancy,[19] there also are studies reporting no difference in depressive symptoms between those with twin- and singleton pregnancy.[20,21] Differences in the literature result from methodologies of the studies. In our study, level of depression at 30-34 weeks of gestation was determined to be higher in those with twin pregnancy.

The stress about parenting may be higher in nulliparous women with twin pregnancy compared to women with twin pregnancy who have an older child/children.[22] Nevertheless, no difference was determined between two studies in regard to reported postnatal stress or general mental health of mother with multiple deliveries and those with singleton delivery.[19,23] In a study on pregnancy, it was determined that rate of depression during final trimester was 30% in mothers with multiple pregnancy who had at least one child, whereas this rate was 6% in those with first and singleton pregnancy.[13] In our study, number of gravida and children were determined to be significantly different between the groups. Majority (41.7%, n=15) of those with twin pregnancy in our study had their first delivery and higher levels of anxiety and depression compared to those with singleton pregnancy differs from a study on pregnancy reported in the literature.

Risk of complication and hospitalization of women with multiple pregnancy is six-fold higher than those with singleton pregnancy.[24] Because the physical change is more pronounced compared to singleton pregnancy, some hypochondriac complaints at the beginning.[25] Women with multiple pregnancy may encounter problems during pregnancy, anxiety about potential delivery problems and health issues they may encounter during postnatal period and have psychological demands.[9]

After gaining weight, thoughts about her husband's dislike of him come to the fore. However, a pregnant woman's husband may feel guilty about the physical and mental distress women experience, because of their role in conceiving. As a result of these perceived differences, women have proposed that they feel themselves alone and, when remain unrecognized, they may cause problems.[26] Women with multiple pregnancy may have feeling of attraction out of proportion to fear of weight gain and rejection.[27]

Studies on perinatal psychology related to multiple pregnancies with assisted reproductive techniques are more common compared to spontaneous multiple pregnancies. Importance of infertility on women's mental health is well-established.[28] In previous studies, it has been shown that mental changes will carry on even after impregnation with treatment.[29] Reason of anxiety shifts from failure to get pregnant towards fetal health.[30] In the light of this information, detection of maternal antenatal anxiety at higher frequency in women with multiple pregnancy with ART is not surprising.[19,20] One or more than two fertilized embryos are usually transferred in order to increase likelihood of survival of at least one fetus and the couple is informed about this situation.[31] In a previous study, more common depressive symptoms were reported in women with spontaneous twin pregnancy compared to women with twin- or singleton pregnancy with

ART and those with spontaneous singleton pregnancy.[18] Following a long-lasting infertility, the multiple pregnancies can be idealized and the parents may underestimate the current problems they may encounter. These couples may not wish multiple pregnancy in order to not being a crowded family suddenly.[32] This may lower the risk of depression through facilitation the adaptation process. Due to increased number of confounding factors in pregnancy with ART, they were not included in our study. Triplet and quadruplet pregnancies were not included due to rarity and higher rate of complications, as generalization would be challenging.

Some limitations should be taken into consideration while interpreting the study results. Only HAD scale was used to evaluate participants' levels of anxiety and depression. The study can be repeated with a similar methodology with scales more specific to depression and anxiety disorder and with larger sample. The study evaluated only final trimester. Levels of anxiety and depression may differ in previous stages of pregnancy. Early diagnosis of potential psychiatric disorders in women with multiple pregnancy may be ensured through repeating these scales at certain intervals during pregnancy and postnatal period.

Despite of all these limitations, this is the first study comparing levels of anxiety and depression of pregnant women with twin pregnancy and singleton pregnancy without ART. With inclusion of those with history of previous or current psychiatric disorders and those with no additional metabolic disease and severe pregnancy complications, it was aimed to minimize the confounding factors.

CONCLUSION

Failure to diagnose and treat the women during perinatal period leads to several negativities in both infant care and domestic relationships. Severe problems may be encountered due to lacking knowledge of the parents and their unwillingness to demand help. On this issue, determination of the parents at risk with screening studies, early diagnosis and administration of supportive therapies provide training and social support programs for the individual and the family, which provides early and effective treatment of many psychiatric disorders. Delivery of more than one baby has additional risks for psychological health compared to delivery of a single baby and, thus, professional care supporting adaptation to this situation is very valuable.[33]

ETHICAL DECLARATIONS

Ethics Committee Approval: For the study, an ethics committee approval was obtained from Konya Chamber of Commerce Karatay University Faculty of Medicine Ethics Committee (Date: 17.07.2020 Desicion Number: 2020/018).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Bursalioglu FS, Aydin N, Yazici E, Yazici AB. The correlation between psychiatricdisorders and women's lives. J Clin Diagnostic Res. 2013;7(4):695–9.
2. Alipour Z, Lamyian M, Hajizadeh E. Anxiety and fear of childbirth as predictors of postnatal depression in nulliparous women. Women and Birth. 2012;25(3):e37–43.
3. Pavy TJG. Psychiatric disorders in pregnancy. Obstet Anesth Uncommon Disord 2nd Ed. 2008;(March):363–70.
4. Biaggi A, Conroy S, Pawlby S, Pariante CM. Identifying the women at risk of antenatal anxiety and depression: A systematic review. J Affect Disord. 2016;191:62–77.
5. Uguz F, Gezginc K, Kayhan F, Sar S, Büyüköz D. Is pregnancy associated with mood and anxiety disorders? A cross-sectional study. Gen Hosp Psychiatry. 2010;32(2):213–5.
6. Stuart S, Couser G, Schilder K, O'Hara MW G, L. Postpartum anxiety and depression: onset and comorbidity in a community sample. J Nerv Ment Dis. 1998;186(7):420–4.
7. Norhayati MN, Nik Hazlina NH, Asrenee AR, Wan Emilin WMA. Magnitude and risk factors for postpartum symptoms: A literature review. J Affect Disord. 2015;175:34–52.
8. Özdamar Ö, Yılmaz O, Beyca Hh, Muhcu M. Gebelik ve Postpartum Dönemde Sık Görülen Ruhsal Bozukluklar (Common Psychiatric Disorders in Pregnancy and Postpartum Period). Zeynep Kamil Tıp Bülteni. 2014;45(2):71.
9. Fisher J, Stocky A. Maternal Perinatal Mental Health and Multiple Births: Implications for Practice. Twin Res. 2003;6(6):506–13.
10. D'alton ME SL. Syndromes in twins. Semin Perinatol. 1995;19:375–86.
11. Wenze SJ, Battle CL, Tezanos KM. Raising multiples: mental health of mothers and fathers in early parenthood. Arch Womens Ment Health. 2015;18(2):163–76.
12. Leonard LG. Depression and anxiety disorders during multiple pregnancy and parenthood. J Obstet Gynecol Neonatal Nurs. 1998;27(3):329–37.
13. Hay DA, Gleeson C, Davies C, Lorden B, Mitchell D, Paton L. What information should the multiple birth family receive before, during and after the birth? Acta Genet Med Gemellol (Roma). 1990;39(2):259–69.
14. First MB, Gibbon M SR ve ark. User's guide for the structured clinical interview for DSM-IV axis I Disorders—Research version. Biometrics Research Department, New York State Psychiatric Institute; 1996.
15. Özkürkçügil A, Aydemir Ö, Yıldız M, Esen Danacı A KE. DSM-IV eksen I bozuklukları için yapılandırılmış klinik görüşmenin türkçeye uyarlanması ve güvenilirlik çalışması. İlaç ve Tedavi Derg. 1999;12:233–6.
16. Cantwell R, Cox JL. Psychiatric disorders in pregnancy and the puerperium. Curr Obstet Gynaecol. 2006;16(1):14–20.
17. Chamberlain G LJ. Prepregnancy Care - A Manual for Practice. Brisbane: Wiley. 1986;
18. Vilska S, Unkila-Kallio L, Punamäki RL, Poikkeus P, Repokari L, Sinkkonen J, et al. Mental health of mothers and fathers of twins conceived via assisted reproduction treatment: A 1-year prospective study. Hum Reprod. 2009;24(2):367–77.
19. Glazebrook C, Cox S, Oates M NG. Psychological adjustment during pregnancy and the postpartum period in single and multiple in vitro fertilization births: a review and preliminary findings from an ongoing study. Reprod Technol. 2001;10:112–9.
20. Jahangiri F, Hirschfeld-Cytron J, Goldman K, Pavone ME, Gerber S K, SC. Correlation between depression, anxiety, and nausea and vomiting during pregnancy in an in vitro fertilization population-a pilot study. J Psychosom Obs Gynaecol. 2011;32:113–8.

21. Thorpe K, Greenwood R, Goodenough T. Does a twin pregnancy have a greater impact on physical and emotional well-being than a singleton pregnancy? 1995;(September):148–52.
22. Colpin H, De Munter A, Nys K, Vandemeulebroecke L. Parenting stress and psychosocial well-being among parents with twins conceived naturally or by reproductive technology. Hum Reprod. 1999;14(12):3133–7.
23. Saigal S. Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. J Pediatr. 1999;135(3):397.
24. Multiple Gestation: Complicated Twin, Triplet, and High-Order Multifetal Pregnancy. Am Coll Obstet Gynecol Pract Bull. 2004;56:104.
25. Robin M, Bydiowski M, Cahen F, Josse D. Maternal Reactions to the Birth of Triplets. 1991;51(July 1989):41–51.
26. Åkerman BA. The psychology of triplets. In: (Ed.) IACS, editor. New York: Routledge.; 1999. p. 100–18.
27. Weigel DJ, Auxier CR, Frye TM. Multiple-birthing trends: Impact on couples and families. Fam J. 2000;8(4):380–6.
28. Sbaragli C, Morgante G, Goracci A, Hofkens T, De Leo V, Castrogiovanni P. Infertility and psychiatric morbidity. Fertil Steril. 2008;90(6):2107–11.
29. Berkenkotter E. Prenatal maternal adjustment after infertility. Diss Abstr Int,. 2002;62(9-B):4209.
30. Lin YN, Tsai YC, Lai pi H. The Experience of Taiwanese Women Achieving Post-Infertility Pregnancy Through Assisted Reproductive Treatment. Fam J. 2013;21(2):189–97.
31. Goldfarb J, Kinzer DJ, Boyle M, Kurit D. Attitudes of in vitro fertilization and intrauterine insemination couples toward multiple gestation pregnancy and multifetal pregnancy reduction. Fertil Steril. 1996;65(4):815–20.
32. Leiblum SR, Kemmann E, Taska L. Attitudes toward multiple births and pregnancy concerns in infertile and non-infertile women. J Psychosom Obstet Gynecol. 1990;11(3):197–210.
33. Malmstrom PM, Biale R. An Agenda for Meeting the Special Needs of Multiple Birth Families. 1990;514(87):507–14.