

The Impact of Unplanned Pregnancy on Prenatal Attachment and Subjective Happiness

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ABSTRACT

Objective: Unplanned pregnancies are a major public health problem that causes undesirable socio-economic and psychological consequences for women, children and families in both developed and developing countries. This study was carried out to evaluate the impact of unplanned pregnancy on prenatal attachment and subjective happiness.

Methods: This analytical cross-sectional study was conducted with 342 pregnant women who attended the Obstetrics and Gynecology outpatient clinic of a university hospital between July 2022 and October 2022. Data was collected using the Demographic Information Form, London Unplanned Pregnancy Determination Scale, Prenatal Attachment Inventory, and Subjective Happiness Scale. The data was evaluated using descriptive statistics, as well as pearson correlation and regression analyses.

Results: Age, number of pregnancies, pregnancy week, feelings experienced upon learning of the pregnancy, and previous pregnancy loss status all appear to have a statistically significant effect on the prenatal attachment and subjective happiness scale ($p<.001$). Regression analysis results show that prenatal attachment and subjective well being have a statistically significant effect on the London Unplanned Pregnancy Determination Scale ($R^2=0.495$).

Conclusion: It has been found that unplanned pregnancies negatively affect early maternal behavior and individual happiness before birth. Therefore, it is considered important to provide counseling and psychosocial support to all pregnant women in order to bond with motherhood and ensure subjective happiness, along with prenatal education.

Keywords: Attachment, fetal, happiness, maternal, unplanned pregnancy

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Introduction

Pregnancy is a transitional period that involves significant physical and emotional changes. It is important to note that it requires psychological preparation and adjustment to new roles and responsibilities for the woman (Perry et al., 2022; Rastad et al., 2021). Unplanned pregnancy means pregnancy that occurs at an unexpected or inappropriate time. This type of pregnancy can be met with surprise by the family and then make the family unhappy (Abajobir et al., 2016). Unplanned pregnancy and its complications are a global problem that concerns women, the family and the community. Women who experience unplanned pregnancies are more prone to smoking, alcohol consumption, drug use, malnutrition during pregnancy, x-rays, low folic acid consumption, maternal and fetal death, miscarriage, low birth weight and preterm labor. It is also known that these women disregard prenatal care (Ekrami et al., 2020; Nelson et al., 2012; Ranatunga & Jayaratne, 2020; Rastad et al., 2021). Unplanned pregnancies can affect prenatal attachment levels as couples do not prepare for the gestation process and parenting role and occur unexpectedly (Mahmoudi et al., 2023).

Prenatal bonding is the emotional and psychological bond that the mother feels towards her unborn baby, which begins with her realization of her pregnancy. This attachment usually begins with a variety of behaviors, such as talking to the fetus during pregnancy, caress the fetus and stomach, and becomes stronger after birth (Harpel et al., 2018; Jangjoo et al., 2021; Mahmoudi et al., 2023). One of the important factors that negatively affect attachment is that pregnancy is unplanned. In unplanned pregnancies, prenatal attachment levels may be adversely affected, as couples do not plan ahead to prepare for pregnancy (Ekrami et al., 2020; Ranatunga et al., 2020).

Unplanned pregnancies are one of the important issues in reproductive health that can negatively affect women's happiness. Unhappiness, hopelessness, fear, suicide, depression in women with unplanned pregnancies, mental health problems such as stress, anxiety, anxious waiting, feelings of being overwhelmed by pregnancy-related changes, constant thought of being sick due to pregnancy, constant remorse about being pregnant (Ranatunga & Jayaratne, 2020; Rastad et al., 2021). Studies have shown that the emotional response of the mother to pregnancy and the level of happiness have very important effects on the decision to maintain pregnancy and adopt healthy behaviors (Abajobir et al., 2016; Goossens et al., 2016; Hasanzadeh et al., 2020; Ranatunga & Jayaratne, 2020; Rastad et al., 2021).

Subjective happiness is a state of psychological well-being, joy and peace. Subjective happiness includes both emotional and cognitive dimensions, the emotional dimension is defined by the presence of positive emotion and the absence of negative emotion, and the cognitive dimension by life satisfaction (Turk et al., 2017). Individuals with higher levels of subjective happiness have more positive thoughts about themselves and have more intense emotional reactions to positive experiences and shorter-term responses to negative ones (Jazayeri et al., 2018; Turk et al., 2017). The lack of happiness during pregnancy can also reduce mother-baby bonding due to negative experiences, poor pregnancy quality and the effect on the mother's sense of worthiness. Such negative experiences occur as irritability and anxiety, and can have harmful effects on both the mother and the fetus due to inappropriate reactions to pregnancy and the resulting stresses and in this case, it negatively affects mother-infant attachment (Ali et al., 2023; Cinar et al., 2017; Ekrami et al., 2020; Mahmoudi et al., 2023; Turk et al., 2017). This study was conducted to evaluate the effect of unplanned pregnancies on mother-infant attachment and subjective happiness.

Methods

Design and Sampling

This study was conducted in the analytical cross-sectional type to assess the impact of unplanned pregnancy on prenatal attachment and subjective happiness. The study was carried out at the Obstetric Polyclinic of a university hospital between July 2022 and October. The literature was reviewed while determining the sample size of the study. In this context, the results of the study conducted by Koç Özkan et al. (2020) were taken as basis. The sample size was calculated as 326 pregnant women using G*power analysis with an effect size of 0.71, $\alpha=0.05$ and 98% power calculation. To increase the power of the study and to account for possible attrition, 380 pregnant women were included in the study. However, 38 pregnant women who did not meet the study criteria were excluded (with a score of >7 on the The London Unplanned Pregnancy Determination Scale, had multiple pregnancy and a diagnosis of risky pregnancy) from the study. The study was conducted with 342 pregnant women. Following polyclinic examinations and procedures, the researcher collected data through face-to-face interviews in a suitable room. The study was conducted with pregnant women who were 18 years of age or older, did not have a chronic disease, did not have communication problems or mental disorders, were

not diagnosed with a risky pregnancy, had a single fetus, scored ≤ 7 points on the The London Unplanned Pregnancy Determination Scale, and agreed to participate in the study. Pregnant women under 18 years of age, with a chronic disease, communication problems, mental illness, diagnosed with risky pregnancy, multiple pregnancies, those who scored >7 points on the London Unplanned Pregnancy Identification Scale and those who refused to participate in the study were excluded from the study.

Measurements

Demographic Information Form, London Unplanned Pregnancy Identification Scale, Prenatal Attachment Inventory and Subjective Happiness Scale were used to collect the data.

Demographic Information Form: It was prepared by the researchers in line with the literature and consisted of sociodemographic questions such as age, education level, family type and income level and questions including obstetric history (Altıparmak et al., 2021; Ali et al., 2023; Çınar et al., 2017; Gencer & Ejder Apay, 2021).

The Subjective Happiness Scale (SHS): The scale was originally developed by Lyubomirsky and Lepper (1999) and adapted into Turkish by Doğan and Totan (2013). It is a 7-point Likert scale consisting of only 4 items, with a range of scores from 4 to 28. High scores on the scale indicate a high level of subjective happiness. In our research, we determined the Cronbach alpha value of the scale to be 0.86.

The London Unplanned Pregnancy Determination Scale (LUPDS): The scale is a psychometric measure developed by Barrett et al. in 2004 to assess unplanned pregnancy. The Turkish validity and reliability of the scale were established by Altıparmak et al. in 2021. The scale adapted to Turkish consists of five items as a result of the reliability and validity analyses and the cut-off score of the scale was calculated as 7. Accordingly, the scores obtained from the scale were determined as ≥ 7 planned and 0-7 unplanned. A minimum of 0 points and a maximum of 10 points can be obtained from the scale. The reliability coefficient of the scale, as measured by Cronbach's Alpha, was 0.90 in the study conducted by Altıparmak et al. (2021). In our research, we found the Cronbach's Alpha value of the scale to be 0.89.

Prenatal Attachment Inventory (PAI): The scale was developed by Mary Müller in 1993 to objectively measure the emotional state experienced by pregnant women and their level of attachment to the baby during the prenatal period. Yılmaz and Beji (2013) conducted a reliability study on the Turkish translation of the inventory and found a Cronbach alpha value of 0.84. The inventory comprises 21

items, each scored between 1 and 4. The inventory's score range varies from 21 to 84. An increase in the score indicates a higher level of attachment to the babies of pregnant women. In our research, we determined the Cronbach alpha value to be 0.85.

Data Analysis

Research data were analyzed using the SPSS (Statistical Package for Social Sciences) program for Windows 25.0. "Reliability analysis" was applied to test the reliability of the scales. Data showing skewness/kurtosis values between -1.5 and +1.5 were found to be normally distributed. Parametric tests were used in the statistical analyzes for the scales with normal distribution. Descriptive statistics, including arithmetic mean and standard deviation values, as well as Pearson correlation and regression analyses (in the analysis, the data meet the multiple regression assumptions) were used to evaluate the data. The level of significance for the statistical evaluation was set at $p < .05$

Ethical Approval

Before starting the research, İstanbul Atlas University, Non-invasive Scientific Research Ethics Committee permission (decision number and date: 18383/15.06.2022) was obtained from the non-interventional scientific research ethics committee of İstanbul Atlas University. In addition, the purpose of the study was explained to the women who accepted the study and their written and verbal consent was obtained in accordance with the principles of the Declaration of Helsinki. All participants were informed that no financial compensation would be provided for their participation. Data were collected through face-to-face interviews in a private room to ensure confidentiality. To protect participant privacy, all the were anonymized and stored in password-protected files on an encrypted computer. No physical or physiological harm was reported during or after the study.

Results

The study found that the women had an average age of 29.12 ± 4.78 . Of the participants, 36.5% had completed high school, 53.2% were employed, and 58.9% had a middle income. Additionally, 77.2% of the participants were in a core family structure. In terms of gestational week, 28.7% were between weeks 0-12. The sex of the baby was not important to 38.5% of the participants, while 69% reported feeling the baby's movements.

It was determined that 61.5% of the pregnant women had mixed feelings, 43.0% had experienced pregnancy loss before and 36.9% had their first pregnancy (Table 1).

Table 1. Socio-Demographic Characteristics of Pregnant Women (n=342)		
Age Max-Min:18-42 Mean±Sd: 29.12±4.78	n (342)	%
Education level		
Primary	104	30.4
High School	125	36.5
University	113	33.1
Employment Status		
Yes	184	53.8
No	158	46.2
Income rate		
Bad	80	23.4
Middle	198	58.9
Good	64	17.7
Family type		
Core family	264	77.2
Extended family	78	22.8
Current gestational week		
0-12 weeks	98	28.7
13-20 weeks	76	22.2
21-29 weeks	88	25.7
30-36 weeks	80	23.4
Preferred sex of the baby		
Girl	98	28.7
Male	112	32.8
I don't mind	132	38.5
Detecting Fetal Movements		
Yes	236	69.0
No	106	31.0
The feeling you had when you found out you were pregnant		
Happiness	60	17.5
Sorrow-Sadness	72	21.0
Mixed-Ambivalent Emotions	210	61.5
Previous pregnancy loss		
Yes	147	43.0
No	195	57.0
Which pregnancy?		
First pregnancy	126	36.9
Second pregnancy	114	33.3
Three or more pregnancies	102	29.8
Duration Between Your Last Pregnancy and Current Pregnancy		
1 years	89	26.0
2 years	65	19.0
3 years and up	62	18.1
First pregnancy	126	36.9

Table 2 shows that the London unplanned pregnancy

determination scale score average is 4.70 ± 1.92 , the prenatal attachment Inventory score average is 52.85 ± 3.45 , and the subjective happiness scale score average is 11.93 ± 8.81 . In addition, as a result of Pearson correlation analysis, a statistically significant positive relationship was found between the London UPR Scale, Prenatal Attachment Inventory and Subjective Happiness Scale ($p < .05$). It is seen that the mean scores obtained from the scales are at a moderate level.

The table 3 presents the results of a multiple regression analysis examining the relationship between the London Unplanned Pregnancy Detection Scale (LUPDS) as the dependent variable and two independent variables: the Prenatal Attachment Inventory (PAI) and the Subjective Happiness Scale (SHS). The model demonstrates statistical significance ($p = .000$) with an F-value of 35.501, indicating that the independent variables significantly predict the dependent variable. The adjusted R^2 value of 0.495 suggests that approximately 49.5% of the variance in LUPDS is explained by the model. Both PAI ($\beta = 0.245$, $t = 4.806$, $p = .000$) and SHS ($\beta = 0.228$, $t = 4.468$, $p = .000$) are significant predictors of LUPDS (Table 3).

The study identified several factors that significantly influence prenatal attachment and subjective happiness. These include the number of pregnancies, the gestational week, the emotions experienced upon learning about the pregnancy, and the history of previous pregnancy loss. The regression analysis revealed that these independent variables collectively account for 9.2% of the variation in the Prenatal Attachment Inventory (Adjusted $R^2 = 0.092$). The model was statistically significant ($F = 14.050$, $p < .001$), and no autocorrelation issues were detected (Durbin-Watson = 1.793). Similarly, the analysis of subjective happiness showed that age, the time interval between the last pregnancy and the current one, the number of pregnancies, and the history of pregnancy loss significantly affect happiness levels. These variables explained 8.1% of the variation in the Subjective Happiness Scale (Adjusted $R^2 = 0.081$). The model was also statistically significant ($F = 9.148$, $p < .001$), with no autocorrelation issues (Durbin-Watson = 1.874) (Table 4). These findings emphasize the importance of addressing emotional and psychological factors during pregnancy, particularly for women with unplanned pregnancies. Midwives and nurses are encouraged to provide counseling and support to improve maternal-infant attachment and overall well-being.

Discussion

The majority of studies have shown that unplanned pregnancy is associated with negative obstetric outcomes,

but so far the effect of unplanned pregnancy on prenatal attachment and happiness remains unclear. Therefore, this study was conducted to determine the effect of unplanned pregnancy on prenatal attachment and subjective level of happiness. Pregnancy is considered a transitional stage that requires psychological preparation for women to accept a new role and responsibility. But facing an unplanned pregnancy and not accepting it; less maternal-fetus attachment during pregnancy and low levels of happiness can lead to unpleasant consequences (Abajobir et al., 2016; Nelson & O'Brien, 2012; Rastadet al., 2021). Pregnancy itself is an experience of physical and mental discomfort.

Therefore, the presence of stress, discomfort and anxiety related to this period leads to a decrease in happiness. Unhappiness leads to negative pregnancy experiences such as premature birth, decreased fetal heart rate, low birth weight, cesarean section, postpartum neurobehavioral problems. At the same time, unhappiness affects the mother's sense of worth, reducing mother-fetus attachment and mother-child attachment. (Baghdari et al., 2017; Busonera et al., 2017; Borghei et al., 2020; Hasanzadeh et al., 2020; Nelson & O'Brien, 2012; Turk et al., 2017).

Table 2.
Mean scores of London Unplanned Pregnancy Detection Scale (LUPDS), Prenatal Attachment Inventory (PAI) and Subjective Happiness Scale (SHS)

	Minimum	Maximum	Mean	Std. Deviation	Max-min can be used
LUPDS Total	0.00	8.00	4.70	1.92	0-10
PAI Total	21.00	64.00	52.93	8.81	21-84
SHS Total	4.00	19.00	11.85	3.45	4-28
Pearson correlation analysis	LUPDS&PAI $r=.335$ $p=.000$; LUPDS&SHS $r=.324$ $p=.000$; PAI&SHS $r=.394$ $p=.000$				

In study found that the level of prenatal attachment for unplanned pregnancies was moderate, with a mean score of 52.93 ± 8.81 . (Table 2). In other studies similar to our finding, prenatal attachment was noted to be moderate (Ozkan et al., 2020; Baghdari et al. 2016; Busonera et al., 2017; Cinar et al., 2017; Ekrami et al., 2020; Harpel & Barras, 2018; Hasanzadeh et al., 2020; Jangjoo et al., 2021; Mahmoudi et al., 2023). However, it can be said that

adaptation to the changes in pregnancy and the effects of other factors may vary at the level of prenatal mother baby attachment. Therefore, nurses and midwives should evaluate the pregnancy as a good observer and help the pregnant woman express her thoughts about her pregnancy and the baby. Pregnant women who are not ready or unable to adapt to the role of motherhood should be given counseling and education.

Table 3.
Regression analysis of London Unplanned Pregnancy Detection Scale (LUPDS), Prenatal Attachment Inventory (PAI) and Subjective Happiness Scale (SHS)

Dependent Variable	Independent variables	β	Standard error	Beta	t	p	F	Model (p)	Adj. R ²	Durbin Watson
LUPDS	Constant	0.202	0.544	-	0.372	.710	35.501	0.000	0.495	1.953
	PAI	0.048	0.010	0.245	4.806	.000				
	SHS	0.127	0.028	0.228	4.468	.000				

In the study, both PAI and SHS were found to be significant predictors of LUPDS. (Table 3). Similarly, studies have shown that an unplanned pregnancy is directly related to prenatal happiness (Ali., 2023; Borghei, et al., 2020; Hasanzadeh et al., 2020; Jazayeri et al., 2018; Nelson & O'Brien, 2012; Turk et al., 2017). The findings of our study are in line with the literature, and the study suggests that unplanned pregnancies occur in the whole community, and these findings are thought to be important for midwives

and nurses to guide the planning and delivery of family planning services.

In the present study, it was determined that age and increase in the number of pregnancies decreased the level of subjective happiness in pregnant women, while the increase in the time between the last pregnancy and the current pregnancy and previous pregnancy loss increased the level of subjective happiness in pregnant women.

(Table 4). Similarly in studies of the age of pregnant women, income status, working condition, place of residence, number of pregnancies, history of abortus, the time between the last two pregnancies, co-age, co-working status and the status of the spouse training, etc, seen as predictors of happiness level (Ali et al., 2023; Rain et al.,

2019; Turk et al., 2017; Gencer & Ejder Apay, 2021). Considering that pregnancy is a period characterized by psychological, physiological and emotional changes, women have difficulty adapting to these changes, so whether pregnancy is planned or not is also considered to be directly related to happiness levels in pregnancy.

Table 4.
Regression Analysis of Prenatal Attachment Inventory (PAI) and Subjective Happiness Scale (SHS)

	Independent variables	β	Standard error	Beta	t	p	F	Model (p)	Adj. R ²	Durbin Watson
Prenatal Attachment Inventory (PAI)	Constant	54.091	2.385	-	22.679	.000	14.050	0.000	0.092	1.793
	Number of pregnancies	-2.893	.547	-.257	-5.292	.000				
	Current pregnancy week	1.507	.496	.147	3.037	.003				
	The feeling experienced when the pregnancy situation is learned	-1.151	.490	-.114	-2.348	.019				
	Previous pregnancy loss status	4.778	1.037	.228	4.608	.000				
Subjective Happiness Scale (SHS)	Constant	21.078	1.345	-	14.258	.000	9.148	0.000	0.081	1.874
	Age	-1.763	.452	-.341	-2.125	.001				
	The time between the last pregnancy and the current pregnancy	2.408	.482	.214	3.037	.041				
	Number of pregnancies	-2.345	.370	-.114	-2.348	.002				
	Previous pregnancy loss status	3.643	1.037	.327	2.425	.039				

In the study, it was observed that the increase in the number of pregnancies and the emotions experienced after learning about pregnancy decreased the level of prenatal attachment in pregnant women, while the increase in the gestational week and previous pregnancy loss increased the level of prenatal attachment in pregnant women. (Table 4). In unplanned pregnancies, women may think they are caught unprepared for parenthood, feel overwhelmed and exhausted by having a more stressful period, and may experience many different emotions when trying to accept this condition. These negative emotions that mothers experience during pregnancy can also affect mother-infant attachment. In the literature, it is stated that women who experience unplanned pregnancies have lower maternal-fetus attachment than women who experience planned pregnancies (Busonera et al., 2017; Ekrami et al., 2020; Jangjoo et al., 2021).

Prenatal attachment is influenced by many factors, individual and environmental. These include: age, education status, work status, family type, income status, marital period and marital harmony, pregnancy, the desired and planned state of pregnancy, the number of pregnancies, pregnancy loss and the number of children living, etc, social support is the state of receiving sleep duration, receiving prenatal care and attending the preparatory class for delivery (Ozkan et al., 2020; Cinar et al., 2017; Ekrami et al., 2020; Hasanzadeh et al., 2020; Jangjoo et al., 2021; Mahmoudi et al., 2023). In our study, it was determined that the number of pregnancies, the week of pregnancy, the feeling experienced when pregnancy is learned and the pregnancy loss situation before affects prenatal attachment (Table 3). In this context, the recognition of these factors by midwives and nurses who interact closely with the pregnant and increasing the awareness of the mother-infant interaction by consulting on this subject, it is a necessary condition for

the protection and development of maternal infant health (Baghdari et al., 2016; Goossens et al., 2016; Ranatunga et al., 2020).

Conclusion and Recommendations

Pregnancy causes a number of physiological and psychological changes in women and enters the process of adapting to the new situation after the woman conceives. This adaptation process is closely related to whether the pregnancy is planned or not. Planned pregnancy is a source of happiness for the pregnant and his family, while unplanned pregnancy changes this situation. When our study results are examined in women with unplanned pregnancy; age, number of pregnancies, week of pregnancy, period between last pregnancy and current pregnancy, period of pregnancy and postpartum pregnancy, period of pregnancy, gestation period, gestation period, pregnancy period, the gestational period and birthday, the feeling experienced when pregnancy is learned and the previous pregnancy loss situation has been seen to fatigue prenatal attachment and subjective happiness. According to these results, it is especially important for midwives and nurses for women with unplanned pregnancies; it is important to provide education and counseling on the role of motherhood in the context of prenatal education and maternity attachment.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Istanbul Atlas University, Non-invasive Scientific Research Ethics Committee (Decision number and date: 18383/15.06.2022).

Informed Consent: Verbal and written consent was obtained from women.

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Author Contributions: Concept – EŞ, SY, EY; Design – EŞ, SY, EY; Supervision – EŞ, SY; Data Collection and/or Processing – EŞ, SY, EY; Analysis and/or Interpretation – EŞ, SY; Literature Search – EŞ, SY, EY; Writing: EŞ, SY; Critical Review – EŞ, SY, EY.

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References

- Abajobir, A.A., Maravilla, J.C., Alati, R., & Najman, J. M. (2016). A systematic review and meta-analysis of the association between unintended pregnancy and perinatal depression. *Journal of Affective Disorders, 192*, 56-63.
- Ali, N., Elbarazi, I., Al-Maskari, F., Loney, T., & Ahmed, L. A. (2023). Happiness and associated factors amongst pregnant women in the United Arab Emirates: The Mutaba'ah Study. *PLoS One, 18*(1), e0268214. <https://doi.org/10.1371/journal.pone.0268214>
- Altıparmak, S., Yilmaz, A. N., & Aksoy Derya, Y. (2021). The

Turkish validity and reliability study of the London measure of unplanned pregnancy. *Journal of Obstetrics and Gynaecology Research, 47*(4), 1362-1370.

- Baghdari, N., Sadeghi Sahebzaad, E., Kheirkhah, M., & Azmoude, E. (2016). The Effects of Pregnancy-Adaptation Training on Maternal-Fetal Attachment and Adaptation in Pregnant Women with a History of Baby Loss. *Nursing and Midwifery Studies, 5*(2), e28949. <https://doi.org/10.17795/nmsjournal28949>
- Barrett, G., Smith, S. C., & Wellings, K. (2004). Conceptualisation, development, and evaluation of a measure of unplanned pregnancy. *Journal of Epidemiology & Community Health, 58*(5), 426-433.
- Borghei, NS., Taghipour, A., & Latifnejad Roudsari, R. (2017). Pregnant mothers' strategies for the management of pregnancy concerns. *Journal of Health, 23*(2):106-125 <http://health.tums.ac.ir/article-1-1784-en.html>
- Busonera, A., Cataudella, S., Lampis, J., Tommasi, M., & Zavattini, G. C. (2017). Prenatal Attachment Inventory: expanding the reliability and validity evidence using a sample of Italian women. *Journal of Reproductive and Infant Psychology, 35*(5), 462-479. <https://doi.org/10.1080/02646838.2017.1349896>.
- Çınar, N., Çaka, S. Y., Topal, s., Yuvaci, H.U., & ErKorkmaz, U. (2017). The relation of health-related practices of pregnant women, fatigue and prenatal attachment. *J Coll Physicians Surg Pak, 27*(11), 693-698.
- Ekrami, F., Mohammad-Alizadeh Charandabi, S., Babapour Kheiroddin, J., & Mirghafourvand, M. (2020). Effect of counseling on maternal-fetal attachment in women with unplanned pregnancy: a randomized controlled trial. *Journal of Reproductive and Infant Psychology, 38*(2), 151-165. <https://doi.org/10.1080/02646838.2019.1636943>
- Dogan, T., & Totan, T. (2013). Psychometric properties of Turkish version of the Subjective Happiness Scale. *The Journal of Happiness & Well-Being, 1*(1), 21-28.
- Gencer, E., & Ejder Apay, S. (2020). Does the desire of pregnancy affect subjective happiness? *Journal of Psychiatric Nursing, 11*(2), 88-97.
- Goossens, J., Van Den Branden, Y., Van der Sluys, L., Delbaere, I., Van Hecke, A., Verhaeghe, S., & Beeckman, D. (2016). The prevalence of unplanned pregnancy ending in birth, associated factors, and health outcomes. *Human Reproduction (Oxford, England), 31*(12), 2821-2833. <https://doi.org/10.1093/humrep/dew266>
- Harpel, T. S., & Barras, K. G. (2018). The impact of ultrasound on prenatal attachment among disembodied and embodied knowers. *Journal of Family Issues, 39*(6), 1523-1544.

- Hasanzadeh, F., Kaviani, M., & Akbarzadeh, M. (2020). The impact of education on attachment skills in the promotion of happiness among women with unplanned pregnancy. *Journal of Education and Health Promotion, 9*(1), 200.
- Jangjoo, S., Lotfi, R., Assareh, M., & Kabir, K. (2021). Effect of counselling on maternal–fetal attachment in unwanted pregnancy: a randomised controlled trial. *Journal of Reproductive and Infant Psychology, 39*(3), 225-235.
- Jazayeri, S.H., Delavar, A., & Quortaj, F. (2018). Developing a model of happiness based on personality traits, emotional intelligence, attachment style, voluntary activities and demographic characteristics. *Counseling Culture and Psychotherapy, 9*(35), 27-56.
- Koç Özkan, T., Şimşek Küçükkeleş, D., and Aydın Özkan, S. (2020). The relationship between prenatal attachment and body perception in pregnancy and influencing factors. *Celal Bayar Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi, 7*(1), 49-54. <https://doi.org/10.34087/cbusbed.587467>
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46*, 137-155
- Mahmoudi, P., Elyasi, F., Nadi, A., & Ahmad Shirvani, M. (2023). The Effect of Maternal-Foetal Attachment-Based Training Programme on Maternal Mental Health Following an Unintended Pregnancy. *Journal of Reproductive and Infant Psychology, 41*(1), 26–42. <https://doi.org/10.1080/02646838.2021.1959538>
- Müller, M.E., & Mercer, R.T. (1993). Development of the prenatal attachment inventory. *Western Journal of Nursing Research, 15*(2), 199-215.
- Nelson, J.A., & O'Brien, M. (2012). Does an unplanned pregnancy have long-term implications for mother–child relationships? *Journal of Family Issues, 33*(4), 506-526.
- Perry, S. E., Hockenberry, M. J., Cashion, K., Alden, K. R., Olshansky, E., & Lowdermilk, D. L. (2022). *Maternal Child Nursing Care-E-Book: Maternal Child Nursing Care-E-Book*. Elsevier Health Sciences.
- Ranatunga, I.D.J.C., & Jayaratne, K. (2020). Proportion of unplanned pregnancies, their determinants and health outcomes of women delivering at a teaching hospital in Sri Lanka. *BMC Pregnancy and Childbirth, 20*(1), 667. <https://doi.org/10.1186/s12884-020-03259-2>
- Rastad, Z., Golmohammadian, M., Jalali, A., Kaboudi, B., & Kaboudi, M. (2021). Effects of positive psychology interventions on happiness in women with unintended pregnancy: randomized controlled trial. *Helion, 7*(8), e07789. <https://doi.org/10.1016/j.heliyon.2021.e07789>
- Türk, R., Sakar, T., & Erkaya, R. (2017). The effect of pregnancy on happiness. *Procedia-Social and Behavioral Sciences, 237*, 1247-1253.
- Yağmur, Y., Oltuluoğlu, H., & Ergin, İ. O. (2019). The effect of fetal gender on the happiness level of mothers in the intrauterine period. *ACU Health Science Journal, 10*, 89-93.
- Yılmaz, S., & Beji, N.K. (2013). Adaptation of Prenatal Attachment Inventory to Turkish: Reliability and Validity Study. *Anatolian Journal of Nursing and Health Sciences, 16*(2), 103-109.