

# A psychological factor associated with pain during intrauterine device insertion: emotional reactivity

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## Summary

**Objective:** Although the experience of pain is multidimensional, and general psychological factors such as anxiety are found to be associated with acute pain, it is necessary to investigate individual emotional variables such as emotional reactivity (ER). The aim of this study was to determine if increased ER is associated with pain during intrauterine device (IUD) insertion even without existing pre-procedure anxiety. **Study Design:** Prospective cohort study. **Methods:** We measured the anxiety level in 237 women using the Beck Anxiety Inventory and the ER level using the Emotional Reactivity Scale (ERS) at Zonguldak Maternity Hospital between November 2018 and March 2019. The women rated their pain during IUD insertion. To evaluate the role of ER in the prediction of pain during IUD insertion, we divided the women into subgroups based on the presence of anxiety and level of pain during IUD insertion. **Results:** ER was higher in women who had anxiety and moderate-severe pain ( $p = 0.001$ ). In women who were not anxious, ER was higher in those who had moderate-severe anticipated pain or IUD insertion pain than in those who had mild anticipated pain or IUD insertion pain ( $p = 0.001$ ). In anxious women, the ERS cut-off value was  $> 34$  for predicting the level of pain whereas in non-anxious women, it was  $> 25$ . **Conclusion:** ER is a psychological factor strongly associated with pain at IUD insertion and the ERS appears to be a beneficial tool for detecting ER for this purpose. Health professionals should be aware that psychological factors could contribute to perceived pain more than physiological factors do. **Implications:** ER is a psychological factor associated with pain at IUD insertion and increased ER is a predictive factor for pain during IUD insertion even without existing pre-procedure anxiety. ERS seems to be a beneficial tool for detecting ER.

**Key words:** Intrauterine Device; Anxiety; Pain; Emotional Reactivity.

## Introduction

The intrauterine device (IUD) can be an ideal, reliable and reversible method for women who require long-term reversible contraception as this approach offers high efficacy (total pregnancy rate of 1.7 per 100 women for the first 3 years of use) [1], low expulsion rate (first-year expulsion rates of the IUD are commonly quoted as 2%–10%) [2], and a lifespan between 5 and 10 years. Despite its well-known efficacy and the fact that it is free of charge in Turkey, it is used by only 17% of women [3]. Several studies have investigated the main barriers to IUD insertion and concluded that fear, pain during insertion and anxiety were the most common obstacles to its use [4, 5]. Nulliparity, not currently breast feeding, older age, history of dysmenorrhea, and lengthier time since last pregnancy are factors reported to be associated with more significant pain [6, 7, 8]. Although the effects of pain during IUD insertion are well established, knowledge is scant about the psychological contributors to the perceived pain during IUD insertion, which can be different from actual pain. A recent study by us demonstrated that experience of cesarean delivery and pre-procedure anxiety were associated with higher pain scores during IUD insertion, and the presence of negative perceptions of IUDs was the most significant predictor

of pain during IUD insertion in parous women [9]. Higher pre-procedure anxiety and higher expected pain during IUD insertion were associated with greater pain in other studies [10, 11].

The experience of pain is multidimensional, and it goes beyond nociceptive stimulation [12]. Although general psychological factors such as depression, distress and anxiety were found to be associated with acute pain, the investigation individual emotional variables and cognitions is necessary [13, 14]. Berna *et al.* demonstrated that negative emotions were correlated with higher perceived pain and negative mood possibly by altering the pain experience via greater activation of neurocircuitry (in the inferior frontal gyrus and amygdala), which is linked to pain-induced changes in emotion regulation mechanisms [15].

Emotional reactivity (ER) is a component of emotion regulation and increased ER likely predisposes individuals to problems with emotion regulation. ER is the tendency to enter an emotional state characterized by the extension of psychological representation of stressful stimuli after their actual termination. Although several studies have focused on the associations between increased ER and anxiety disorders [16-18], there is little available information about the relationship between acute pain and ER.

The aim of the present study was to investigate the rela-

relationship between ER, anxiety and pain during IUD insertion to determine if increased ER is a factor associated with pain during IUD insertion even without existing pre-procedure anxiety.

## Methods

We conducted a prospective cohort study at Zonguldak Maternity Hospital from November 2018 to March 2019. Eligible participants were: aged 18 to 40 years old, desired IUD placement for contraception, had no history of cervical surgery or psychological disease and had not taken any pain or anxiety drugs before the IUD insertion. Women were excluded if IUD insertion was performed for emergency contraception or if they had absolute contraindications to IUD insertion, the presence of cervical stenosis, or dysmenorrhea. A total of 237 women completed the pre-procedure questionnaires to evaluate their demographic characteristics.

We measured the participant's level of anxiety using the Beck Anxiety Inventory (BAI) which Turkish validation was performed by Ulusoy *et al.* [19]. Classification of BAI scores are as follows: minimal anxiety 0 to 7, mild anxiety 8 to 15, moderate anxiety 16 to 25, and severe anxiety 30 to 63. According to scores 78 women were anxious, and 159 women were not anxious.

To measure the levels of ER, we used Emotional Reactivity Scale (ERS) which is a 21-item self-report measure [16]. Responders rate the degree to which each item applies to them on a 5-point Likert-type scale. Higher scores indicate higher levels of ER. ERS has been translated and validated for the Turkish population by Secer *et al.* [20]. To determine the construct validity of the scale, Secer *et al.* performed exploratory factor analysis. Factor loadings of items number 6, 11, 13, and 17 were found to be less than .30, and these factors were excluded from further analysis [20]. The final ERS consisted of 17 items with a Likert scale ranging from 0 to 3 and raw scores ranging from 0 to 51.

No pre-procedure analgesia was used before the intervention. Pre-procedure evaluations and IUD insertions were done separately and blindly. A copper T380A IUD was used in all participants. While viewing a posted visual analogue scale (VAS), the participants rated their pain at the time of uterine sounding by hysteroscope which we have demonstrated is the most painful step in IUD insertion [9]. It was demonstrated that a change of 9 to 14 mm on 100 mm VAS represents the minimal clinically important difference in perceived pain that is reproducible among women experiencing both mild and severe forms of pain [21, 22]. We grouped pain scores into categories of mild (0-30 mm) and moderate-severe (31-100 mm). Whereas 120 women reported mild pain, 117 women reported moderate-severe pain.

To evaluate ER for predicting pain during IUD insertion, we classified 39 women who were anxious (BAI score  $\geq$  1) and reported mild pain (VAS score 0-30 mm) as group 1,

39 women who were anxious (BAI score  $\geq$  1) and reported moderate-severe pain (VAS score 31-100 mm) as group 2, 81 women who were not anxious (BAI score = 0) and reported mild pain (VAS score 0-30 mm) as group 3, and 78 women who were not anxious (BAI score = 0) and reported moderate-severe pain (VAS score 31-100 mm) as group 4. A flow chart explaining patient selection is shown in Figure 1.

### Statistical analysis

IBM SPSS, version 19.0 (IBM, Armonk, NY, US), was used to carry out the statistical analysis. Continuous values were presented with mean, standard deviation (SD), median, minimum and maximum values; categorical variables were presented with frequencies and percentages. The Shapiro–Wilk test was used to test for normality. The independent samples *t* test or Mann–Whitney *U* test was used to test whether variables were normally distributed. The Fisher–Yates exact  $\chi^2$  test was used to compare categorical variables between groups. Multiple linear regression analysis was used to find the best model to predict the stage of highest pain during IUD insertion. All statistical comparisons with a *p*-value below 0.05 were assumed to be statistically significant. Mann–Whitney *U* and Kruskal–Wallis tests used for group comparisons for continuous variables. Youden index calculated with sensitivity and specificity values with 95% CI by ROC analysis for the diagnostic cut-off values of the ERS.

## Results

We compared the demographic and clinical characteristics of 120 women who reported mild pain and 117 women who reported moderate-severe pain (Table 1). Although age, body mass index (BMI), occupational status and lactational status were similar among the participants, previous IUD insertion experience was higher in women with mild pain ( $p = 0.001$ ). Anticipated mean VAS pain scores, mean VAS pain scores at IUD insertion and ER were higher in the patients with moderate-severe pain ( $p = 0.001$ ). Importantly the BAI scores were similar in the patients who reported mild or moderate-severe pain ( $4.87 \pm 8.02$  vs.  $4.43 \pm 6.60$ , respectively,  $p = 0.984$ ).

We regrouped the patients to understand more about the relationship between pain during IUD insertion, ER and anxiety (Figure 1). The demographic characteristics and obstetric history of the women are presented in Table 2. Age, BMI, occupational status and lactational status were similar between the groups. Previous IUD insertion experience was higher in group 3 [anxiety (-), mild pain] women ( $p = 0.001$ ).

Anticipated mean VAS pain scores were higher in women in group 2 [anxiety(+), moderate-severe pain] than in all other groups ( $p = 0.001$  both; Table 3). In paired comparisons of anticipated mean VAS pain scores between the groups, the only similarity was seen between in group 1 [anxiety(+), mild pain] and group 3 [anxiety(-), mild pain]. Mean VAS pain scores at IUD insertion were also higher in

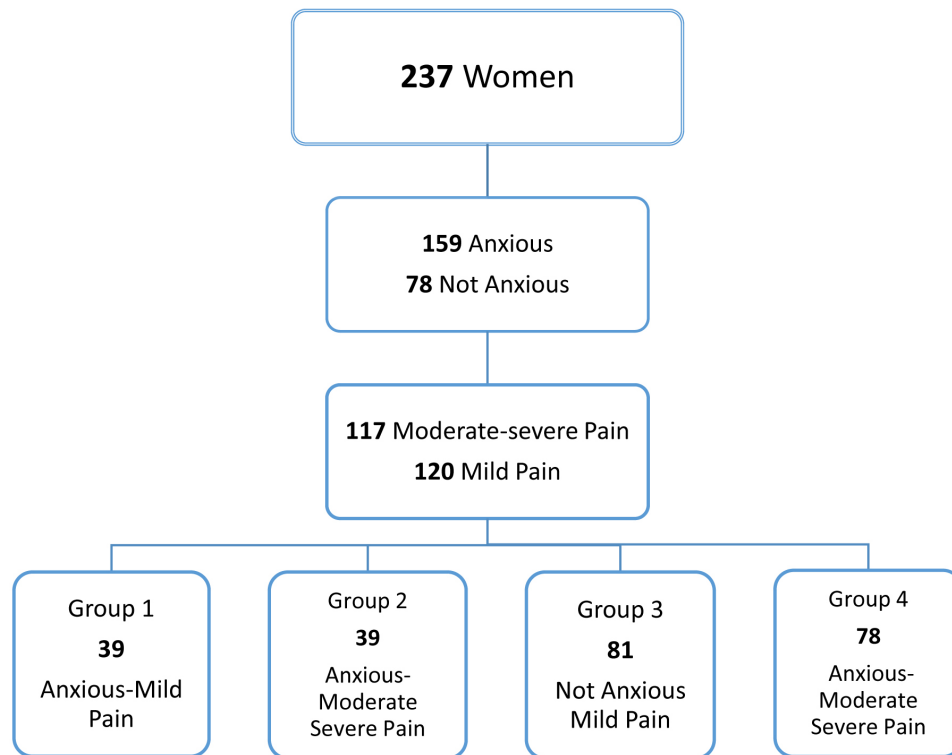


Figure 1. — Study design flow chart.

group 2 women [anxiety(+), moderate-severe pain] than all other groups ( $p = 0.001$ , both). The same similarity was observed, in anticipated mean VAS scores. In the paired comparisons of mean VAS pain scores at IUD insertion between the groups, the only similarity was seen between women in group 1 [anxiety(+), mild pain] and group 3 [anxiety(-), mild pain]. Importantly, the presence of anxiety did not change the pain outcomes in women who had mild anticipated or mild IUD insertion pain (i.e., groups 1 and 3). Women in group 3 and group 4 had no anxiety and their BAI scores were null. Statistical calculations could not be performed for group 3 or group 4. We observed similar BAI scores in group 1 and group 2 ( $15.00 \pm 6.77$  vs.  $13.30 \pm 3.47$ ,  $p = 0.496$ ).

ER was higher in women in group 2 [anxiety(+), moderate-severe pain] than in all other groups ( $p = 0.001$ , both). We established significance in paired comparisons of ER between all groups ( $p = 0.001$  both, Table 2). Among the women who had no pre-procedure anxiety (i.e., group 3 and 4), ER was higher in those who had moderate-severe anticipated or IUD insertion pain (group 4) than in those who had mild anticipated or IUD insertion pain (group 3,  $p = 0.001$ ).

To determine whether ERS could predict mild or moderate-severe pain, receiver-operating characteristic curve analysis was performed. In anxious women, the ER cut-off value was  $>34$  with 100% sensitivity (95% confi-

dence interval [CI] 91-100) and 92.31% specificity (95% CI 79.1-98.4). In non-anxious women, the ER cut off value was  $>25$  with 88.46% sensitivity (95% CI 79.2-94.6) and 100% specificity (95% CI 95.5-100).

We conducted subgroup analysis to further investigate the impact of parity which is a known physiological predictor of pain (Figure 2). In the anxious nulliparous women, the ER cut-off value was  $>24$  with 100% sensitivity (95% CI 76.8-100) and 66.67% specificity (95% CI 29.9-92.5). In the anxious multiparous women, the ER cut-off value was  $>34$  with 100% sensitivity (95% CI 85.8-100) and 100% specificity (95% CI 88.4-100). In the non-anxious nulliparous women, the ER cut-off value was  $>19$  with 88% sensitivity (95% CI 68.8-97.5) and 100% specificity (95% CI 81.5-100). In the non-anxious multiparous women, the ER cut-off value was  $>25$  with 88.9% sensitivity (95% CI 77.4-95.8) and 100% specificity (95% CI 94.3-100).

## Discussion

We found that the women who had increased ER had more pain at IUD insertion and increased ER was strongly associated with pain in women who were anxious and importantly even non-anxious.

Despite the knowledge of various physiological pain predictors and the fact that local anesthesia was used in most of the previous studies, high pain scores were obtained [23-25]. Shahnazi *et al.* used aromatherapy to reduce pain at

Table 1. — Demographic characteristics, obstetric history and clinical characteristics of women

Characteristics	Patients with mild pain n (120)	Patients with moderate-severe pain n (117)	p value
Age*	33.60 ± 8.40	32.77 ± 6.80	0.055
BMI*	29.39 ± 3.84	25.57 ± 4.06	0.138
Occupation n[%]	24 [20]	18 [15.4]	0.447
Lactating n[%]	36 [30]	42 [35.9]	0.334
Previous IUD <sup>a</sup> insertion experience	84 [70]	42 [35.9]	0.001
Nulliparity	27 [22.5]	39 [33.3]	0.63
Multiparity	93 [77.5]	78 [66.7]	0.63
Anticipated VAS <sup>b</sup> pain scores*	23.00 ± 16.68	58.71 ± 22.18	0.001
VAS pain scores at IUD <sup>a</sup> insertion*	15.25 ± 7.09	53.00 ± 19.84	0.001
ERS <sup>c</sup> scores*	17.40 ± 9.44	39.84 ± 9.75	0.001
BAI <sup>d</sup> scores*	4.87 ± 8.02	4.43 ± 6.60	0.984

N = no of patients, \*Data presented as mean ± SD

<sup>a</sup>Intrauterine Device, <sup>b</sup> Visual Analogue Scale, <sup>c</sup>Emotional Reactivity Scale, <sup>d</sup> Beck Anxiety Inventory, <sup>e</sup> Chi-square test.

Table 2. — Demographic characteristics, Mean VAS<sup>a</sup> and ERS<sup>b</sup> scores

Characteristics	group 1	group 2	group 3	group 4	p value
	anxiety(+) mild pain n(39)	anxiety(+) moderate-severe pain n(39)	anxiety(-) mild Pain n(81)	anxiety (-) moderate-severe pain n(78)	
Age*	33.08 ± 5.622	32.31 ± 6.005	31.99 ± 7.012	33.00 ± 7.190	0.098
BMI*	27.46 ± 3.78	25.51 ± 3.56	25.87 ± 3.78	25.61 ± 4.31	0.125
Occupation n[%]	9 [23.1]	3 [7.7]	15 [18.5]	15 [19.2]	0.306
Lactating n[%]	9 [23.1]	15 [38.5]	27 [33.3]	27 [34.6]	0.501
Previous IUD <sup>c</sup> insertion experience	18 [46.2]	15 [38.5]	66 [81.5]	27 [34.6]	0.001
Nulliparity	9 [23.1]	15 [38.5]	18 [22.2]	24 [30.8]	0.237
Multiparity	30 [76.9]	24 [61.5]	63 [77.8]	54 [69.2]	0.237
Anticipated VAS <sup>a</sup> pain scores*	26.92 ± 18.80	66.92 ± 21.17	21.11 ± 15.32	54.61 ± 21.66	0.001 <sup>e.g.h.i.j</sup>
VAS pain scores at IUD <sup>b</sup> insertion*	16.92 ± 8.32	62.30 ± 24.86	14.44 ± 6.32	48.07 ± 15.29	0.001 <sup>e.g.h.i.j</sup>
ERS <sup>c</sup> scores*	27.23 ± 7.88	44.00 ± 5.04	12.66 ± 5.78	37.76 ± 10.84	0.001 <sup>e.f.g.h.i.j</sup>
BAI <sup>d</sup> scores*	15.00 ± 6.77	13.30 ± 3.47	-	-	0.496 <sup>e</sup>

N = no of patients, <sup>a</sup>Visual Analogue Scale, <sup>b</sup> Emotional Reactivity Scale, <sup>c</sup> Intrauterine Device, <sup>d</sup>Beck Anxiety Inventory.

p values: <sup>e</sup>between groups 1 and 2, <sup>f</sup>between groups 1 and 3, <sup>g</sup>between groups 1 and 4, <sup>h</sup>between groups 2 and 3, <sup>i</sup>between groups 2 and 4, <sup>j</sup>between groups 3 and 4.

\*Data presented as Mean VAS score ± SD.

IUD insertion and found no effect. They concluded that pain is a mental feeling and a combination of sensory, emotional, and cognitive components rather than a sign [26].

Another major contributor to pain at IUD insertion was anxiety. It is well known that higher anxiety levels may increase perceived pain to levels worse than the pain actually is [27-29]. A previous study found that women who were more anxious and who anticipated that the procedure would be painful recalled later that it was a painful experience even if they had not experienced any pain during the procedure [4]. The presence of negative perceptions about IUDs, a previous negative history of painful vaginal procedure, or a vaginal examination history that was painful could contribute to pain perception and increase anticipated and actual pain at IUD insertion [9].

Stress and emotional response can affect the pain per-

ception at IUD insertion. Although general psychological factors such as anxiety have been found to modulate pain, some studies investigated pain-specific emotions and cognitions [30, 31]. Ifeagwazi *et al.* found a relationship between ER and hypertension [32], whereas Marki *et al.* investigated the relationship between emotion regulation and endometriosis [33]. Our study is the first to demonstrate that increased ER is a factor strongly associated with pain at IUD insertion, even when there was no established anxiety.

The main strengths of our study are that only one physician inserted the same type of IUD to all participants blindly and no pre-procedure medication was used. However, our study was limited by the fact that it did not explore the full variety of psychological mechanisms (e.g., pain hypervigilance, pain anxiety, and pain catastrophizing).

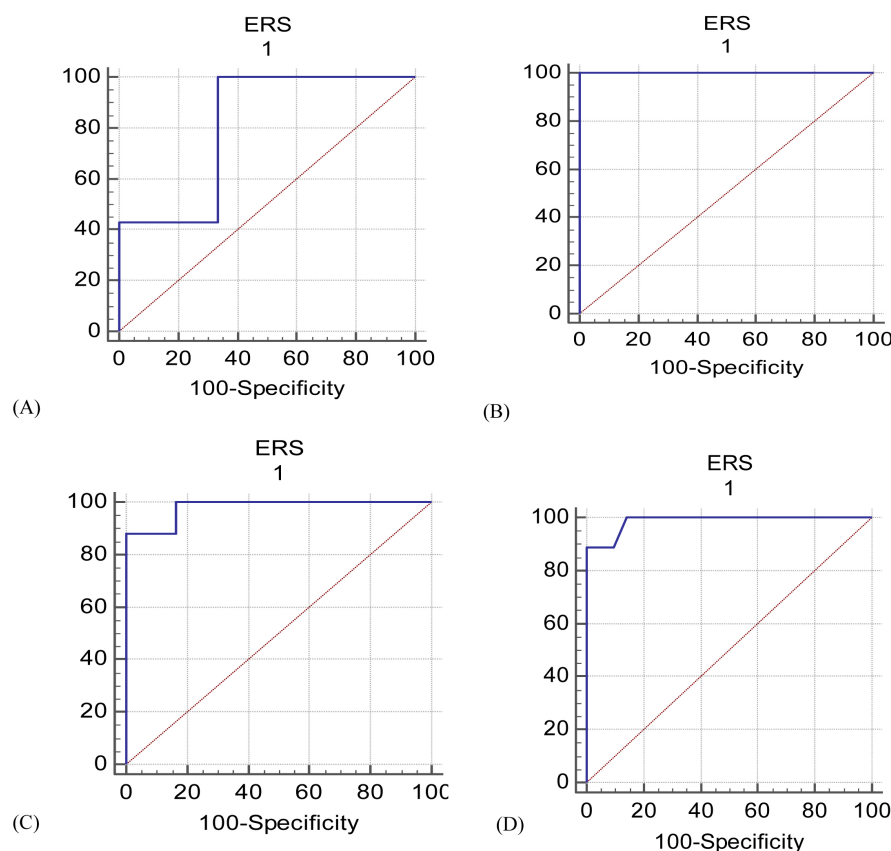


Figure 2. — ROC Curves of ERS for discrimination of mild or moderate-severe pain. A) Anxious nullipar women, B) Anxious multipar women, C) Non-anxious nullipar women, D) Non-anxious multipar women.

Our study shows that ER, which is a pain specific psychological variable, is strongly associated with pain at IUD insertion. Determining the true predictors of pain is important in patient counselling. Pre-insertion counselling should aim to modulate the woman's expectation of pain. In addition investigation of the emotional aspect of pain beyond general psychological factors is required to evaluate patients properly and to identify who may benefit from extra reassurance.

In conclusion, ER is psychological factor significantly associated with pain at IUD insertion and ERS appears to be a beneficial tool for the detection of ER for this purpose. Health professionals should be aware that psychological factors can contribute to perceived pain more than physiological factors do. Counseling to inform women of the true benefits and risks of IUDs and providing reassurance to decrease ER and anxiety might be good strategies to manage the pain associated with IUD insertion.

#### Ethics Approval and Consent to Participate

An ethics committee report was obtained from the School of Medicine, Bulent Ecevit University (number: 2018-165-02/10).

#### Conflict of Interest

The authors declare no competing interests.

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#### References

- [1] The TCu380A IUD and the frameless IUD "the FlexiGard", interim three-year data from an international multicenter trial, UNDP, UNFPA, and WHO Special Programme of Research, Development and Research Training in Human Reproduction, World Bank, IUD research group. *Contraception*, 1995, 52, 77–83.
- [2] Madden T., McNicholas C., Zhao Q.H., Secura G., Eisenberg D., Peipert J.: "Association of age and parity with intrauterine device expulsion". *Obstet Gynecol.*, 2014, 124, 718–726.
- [3] Turkey Demographic and Health Survey 2013 (In Turkish). Available from: [www.sck.gov.tr/nufus/T%C3%BCrkiye%20N%C3%BCfus%20ve%20Sa%C4%9F1%C4%B1k%20Ara%C5%9F1%C4%B1rmas%C4%B1%202013.pdf](http://www.sck.gov.tr/nufus/T%C3%BCrkiye%20N%C3%BCfus%20ve%20Sa%C4%9F1%C4%B1k%20Ara%C5%9F1%C4%B1rmas%C4%B1%202013.pdf) (30 April 2019).
- [4] Murty J.: "Use and effectiveness of oral analgesia when fitting an intrauterine device". *J Fam Plann Reprod Health Care*, 2003, 29, 150–151.
- [5] Bharadwaj P., Akintomide H., Brima N. *et al.*: "Determinants of long-acting reversible contraceptive (LARC) use by adolescent girls and young women". *Eur J of Contracept Reprod Health Care*, 2012, 17, 298–306.
- [6] Brockmeyer A., Kishen M., Webb A.: "Experience of IUD/IUS insertions and clinical performance in nulliparous women—a pilot study". *Eur J Contracept Reprod Health Care*, 2008, 13, 248–254.

- [7] Hubacher D., Reyes V., Lillo S., Zepeda A., Chen P.L., Croxatto H.: "Pain from copper intrauterine device insertion, randomized trial of prophylactic ibuprofen". *Am J Obstet Gynecol*, 2006, 195, 1272-1277.
- [8] Maguire K., Davis A., Rosario Tejada L., Westhoff C.: "Intracervical lidocaine gel for intrauterine device insertion, a randomized controlled trial". *Contraception*, 2012, 86, 214-219.
- [9] Akdemir Y., Karadeniz M.: "The relationship between pain at IUD insertion and negative perceptions, anxiety and previous mode of delivery". *The European Jour J Contracept Reprod Health Care*, 2019, 24, 240-245.
- [10] Allen R.H., Carey M.S., Raker C., Goyal V., Matteson K.: "A prospective cohort study of pain with intrauterine device insertion among women with and without vaginal deliveries". *J Obstet Gynaecol*, 2014, 34, 263-267.
- [11] Goldstuck N.D., Matthews M.L.: "A comparison of the actual and expected pain response following insertion of an intrauterine contraceptive device". *Clin Reprod Fertil*, 1985, 3, 65-71.
- [12] Keefe F.J., Lumley M., Anderson T., Lynch T., Carson K.: "Pain and emotion, New research directions". *J Clin Psychol*, 2001, 57, 587-607.
- [13] Loggia M.L., Mogil J.S., Bushnell M.C.: "Experimentally induced mood changes preferentially affect pain unpleasantness". *J Pain*, 2008, 9, 784-791.
- [14] Pinto P.R., McIntyre T., Almeida A., et al.: "The mediating role of pain catastrophizing in the relationship between presurgical anxiety and acute postsurgical pain after hysterectomy". *Pain*, 2012, 153, 218-226.
- [15] Berna C., Leknes S., Holmes E.A., Edwards R.R., Goodwin G.M., Tracey I.: "Induction of depressed mood disrupts emotion regulation neurocircuitry and enhances pain unpleasantness". *Biol Psychiatry*, 2010, 67, 1083-1090.
- [16] Nock M.K., Wedig M.M., Holmberg E.B. et al.: "The emotion reactivity scale, development, evaluation, relation to self-injurious thoughts and behaviors". *Behav Ther*, 2008, 39, 107-116.
- [17] Decker M.L., Turk C.L., Hess B., Murray C.E.: "Emotion regulation among individuals classified with and without generalized anxiety disorder". *Journal of Anxiety Disorders*, 2008, 22, 485-494.
- [18] Mennin D.S., McLaughlin K.A., Flanagan T.J.: "Emotion regulation deficits in generalized anxiety disorder, social anxiety disorder, and their cooccurrence". *Journal of Anxiety Disorders*, 2008, 23, 866-871.
- [19] Ulusoy M., Sahin N.H., Erkmen H.: "Turkish version of Beck Anxiety Inventory, Psychometric properties". *J of Cognitive Psychotherapy*, 1998, 12, 2.
- [20] Secer I., Halmatov S., Gencdogan B.: "Translation and validation of emotional reactivity scale in turkish". *Sakarya University Journal of Education*, 2013, 3, 77-89. (In Turkish) [https://scholar.google.com.tr/scholar?hl=tr&as\\_sdt=0%2C5&q=Secer+I%2C+Halmatov+S%2C+Gencdogan+B&btnG=\(accessed30april2019\)](https://scholar.google.com.tr/scholar?hl=tr&as_sdt=0%2C5&q=Secer+I%2C+Halmatov+S%2C+Gencdogan+B&btnG=(accessed30april2019))
- [21] Todd K.H., Funk K.G., Funk J.P., Bonacci R.: "Clinical significance of reported changes in pain severity". *Ann Emerg Med*, 1996, 27, 485-489.
- [22] Kelly A.M.: "The minimum clinically significant difference in visual analogue scale pain score does not differ with severity of pain". *Emerg Med J*, 2001, 18, 205-207.
- [23] Chi I.C., Galich L.F., Tauber P.F. et al.: "Severe pain at interval IUD insertion, a case control analysis of patient risk factors". *Contraception*, 1986, 34, 483-495.
- [24] Torky H., Moussa A., El-Desouky E.S., Dief O., Ahmed A.: "Lidocaine gel vs lidocaine spray in reducing pain during insertion of the intrauterine contraceptive device". *Eur J Contracept Reprod Health Care*, 2017, 22, 159-161.
- [25] Allen R.H., Raker C., Goyal V.: "Higher dose cervical 2% lidocaine gel for IUD insertion, a randomized controlled trial". *Contraception*, 2013, 88, 730-736.
- [26] Shahnazi M., Nikjoo R., Yavarikia P., et al.: "Inhaled lavender effect on anxiety and pain caused from intrauterine device insertion". *J Caring Sci*, 2012, 28, 255-261.
- [27] Reading A.E., Newton J.R.: "Psychological factors in IUD use – a review". *J Biosoc Sci*, 1977, 9, 317-323.
- [28] Brima N., Akintomide H., Iguvovwe V., Mann S.: "A comparison of the expected and actual pain experienced by women during insertion of an intrauterine contraceptive device". *Open Access J Contracept*, 2015, 16, 21-26.
- [29] Akintomide H., Brima N., Sewell R.D., Stephenson J.M.: "Patients' experiences and providers' observations on pain during intrauterine device insertion". *Eur J Contracept Reprod Health Care*, 2015, 20, 319-326.
- [30] Sommer M., de Rijke J.M., van Kleef M., et al.: "Predictors of acute postoperative pain after elective surgery". *Clin J Pain*, 2010, 26, 87-94.
- [31] Lautenbacher S., Huber C., Baum C., et al.: "Attentional avoidance of negative experiences as predictor of postoperative pain ratings and consumption of analgesics, comparison with other psychological predictors". *Pain Med*, 2011, 12, 645-653.
- [32] Ifeagwazi C.M., Egberi H.E., Chukwuorji J.C.: "Emotional reactivity and blood pressure elevations, anxiety as a mediator". *Psychol Health Med*, 2018, 23, 585-592.
- [33] Márki G., Bokor A., Rigó J., Rigó A.: "Physical pain and emotion regulation as the main predictive factors of health-related quality of life in women living with endometriosis". *Hum Reprod*, 2017, 32, 1432-1438.

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