



## Original Article

## The effect of the copper intrauterine device (Cu-IUD) and the injectable depo-medroxyprogesterone acetate (DMPA) use on women's sexual satisfaction and depression

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## ABSTRACT

**Background & Aim:** Intrauterine device and depo-medroxyprogesterone acetate are among the most effective reversible contraception in the world, still few consensuses exist about sexual and mood changes of these two conventional methods. The present study has compared the sexual satisfaction and depression level in these two methods.

**Methods & Materials:** A cross-sectional study was conducted between August 2017 and January 2018, in 300 married women aged 19-50 year, in Tehran, Iran. One hundred and fifty IUD users and 150 DMPA consumers, 12-18 months after starting the current method, recruited to the study from 34 health centers of Tehran University of Medical Sciences by convenience sampling. Two standard questionnaires of Index of sexual satisfaction (ISS) and Patient Health Questionnaire (PHQ) were used for assessing sexual satisfaction and depression, respectively. Chi-square and independent t-test were used for the homogeneity of the two groups. The linear logistic regression analysis was conducted to estimate the strength of associations.

**Results:** There was not any significant difference between two groups in demographic characteristics such as age, marriage duration, education level, number of children and breastfeeding condition ( $P>0.05$ ). Significantly higher sexual satisfaction ( $P<0.001$ ) and lower depression level ( $P<0.001$ ) reported in IUD users than DMPA consumers in the t-test. A multivariate regression confirmed that sexual satisfaction increased 6.4 scores in the IUD group in comparison to DMPA users ( $P= 0.003$ ,  $B= -6.4$ ), and with increase 1 year to duration of the marriage, sexual satisfaction increase 0.33 score. For depression, the only significant variable was the contraceptive methods, and depression level increase 1.24 scores in DMPA users than IUD consumers. ( $P=0.006$ ,  $B= - 1.24$ ). Although in univariate analysis, some variables showed effects on sexual satisfaction and depression, multivariate regression results did not confirm any significant relationships.

**Conclusion:** Both sexual satisfaction and mood level was higher among IUD users. This paper reconfirmed that IUD is a preferable method in women who are eligible to use both methods.

**Introduction**

IUD and injectable contraceptives (mainly DMPA) are among the most common reversible and effective contraceptive methods (1). United Nations contraceptive report in 2015 showed that the world contraceptive prevalence for IUD and DMPA had been 14% and 5%, respectively. IUD and DMPA prevalence has been completely reversed in the least developed countries, with 1% and 13%, respectively. This report also indicated a shift toward DMPA users (Increasing from 2% to 7% of

all use) between 1994 to 2015 that mainly has been due to changing geographic composition and economic situation of users. In many least developed countries, injectable methods have been common over the past two-decade due to reasonable prices and also the ability to administered with minimal training (in comparison to other contraceptives such as IUD) (1).

Iran has been one of the prosperous countries in the achievement of the family planning goals. For the change in the population pyramid and current contraceptive policy in Iran that encourage people to use reversible methods; IUD and DMPA have been changed to the most common long-time methods (2). In Iran, IUD and DMPA coverage has been 7.2% and 0% in 1994 (3) and 8.4% and 3.6%,

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respectively in 2015 (1). Although this trend in favor of DMPA is similar to the world changes, it could be notable if we consider the family planning services in Iran. All of the contraceptive methods are available free of charge, inaccessible governmental health centers in all the cities and villages. Regarding relative IUD advantage over DMPA in WHO categories (2), and the free and available access to both methods in Iran, the cause of this shift needs to be explored, and one the possible explanation would be the side effects of these two methods.

Although many types of research have been evaluated the side effects of contraceptives, the effects of contraceptives on sexuality are still unclear. Meanwhile, different contraceptives have various effects on mood and sexuality (4). Contraceptives by protection against pregnancy can decrease stress and contribute to more sexual contact and, consequently, more pleasure, enjoyment, and happiness. Conversely, some side effects of contraceptives such as bleeding, abdominal cramp, mood and weight changes can have adverse effects on sexuality (5). This challenge is even more about DMPA due to less researches in this method (4). Also, most researches take a physiological approach to female sexuality and they evaluated the sexual function or sexual desire (6, 7) solely. However, some of the side effects have negative consequences on psychological and interpersonal factors that can be better addressed by sexual satisfaction (5, 7).

There is also controversy about mood changes in contraceptive users, especially DMPA users (8,9). One reason could be the different time of assessing mood. If the mood assesses immediately after starting a method, it can lead to false results (10).

In addition to the lack of a worldwide consensus on some IUD and DMPA side effects, cultural and religious issues can influence multifactorial variables such as sexuality and mood. (5). About all of these gaps, the present study aimed to assess the effects of the Cu-IUD and DMPA on women's sexual satisfaction and depression in whom use from these contraceptives

between 12-18 months. The present paper is part of the large project that has been compared many side effects of these two methods and we had to mention some of the other side effects in the discussion part.

## **Methods**

The present research is a cross-sectional study conducted in Tehran, Iran. At first, the necessary scientific permissions were obtained from the Tehran University of Medical Sciences.

Convenience sampling was conducted between September 2017 and January 2018 in 34 main health centers of Tehran University of Medical Sciences. To a maximum estimation of the sample size, a review of the studies conducted on contraceptives indicated that the continuation rate of IUD and DMPA had been 60% and 44% (8). Considering a two-sided 95% confidence interval with an 80% power, a sample size of 300 women was obtained. The covered population of all centers was the same, and for the sample size of 300, in each center enrolled five women with IUD and five women with DMPA. Participants of the two groups were not matched but the same number of IUD and DMPA users has chosen from each center. Finally, two groups showed no significant difference in demographic characteristics.

We contacted 1200 women, 500 women did not intend to participate in the study, and 400 women did not have our criteria. Finally, 300 healthy married women in the two equal groups of women who used IUD and DMPA entered to the study. The tenets of the current version of the Declaration of Helsinki were followed. Participants were apprised of the nature of the survey, and verbal and written informed consent was obtained. The questionnaire was filled out in one session by participants in health centers, and one female researcher was in attendance in all cases. The inclusion criteria were, married women aged 19-50 years whom insertion or injection of IUD and DMPA were between 20.03.2016 and 21.9.2016

(12-18) months usage of IUD or DMPA at the beginning of the study), sexually active; exclusion was current history of the alcohol or drug abuse, history of the usage any concurrent hormonal contraceptives or estrogen and progesterone hormones from 2 months before the starting the current contraceptives methods till now.

Two questionnaires and one demographic form served as the research tools. The demographic form included 9 demographic questions and two questions about perceived mood and sexual satisfaction changes after starting the current method until research's time (during the last 12 -18 months).

Evaluation of the sexual satisfaction in the present research consisted of the level of current sexual satisfaction (assessed by ISS) and perceived sexual effects of the methods over time (assessed by a single question). The Index of sexual satisfaction (ISS) used as the second questionnaire and comprised 25 multiple-choice (5-choice) questions with a minimum score of 0 and maximum score of 100. In the original paper, some cut of points considered for this questionnaire. The score less than 26 considered as very high sexual satisfaction, 26-50 as high, 51-75 low, and more than 75 as very low sexual satisfaction. Internal consistency and test-retest reliability were found to be over .90, and the scale has a discriminant validity coefficient of .76 (11). "Perceived sexual satisfaction changes" assessed with the following single item: "what was the effect of the current contraceptive on your sexual satisfaction" and three responses "positive effects," "negative effects" and "no difference."

Depression evaluation consisted of the asses of the current depression (assessed by the Patient Health Questionnaire (PHQ-9) and perceived mood effects of the method over time (assessed by a single question). PHQ-9 questionnaire was comprised of 9 multiple-choice (4-choice) questions with a minimum score of 0 and maximum score of 27 (12).

In the present study score 0-4, 5-9, 10-15 and  $\geq 15$  considered as no depression, low, average and high depression. The validity of the test in Iran was confirmed as per the obtained scores in test specificity (76.20%), sensitivity (73.80%) and its reliability were confirmed as per the 0.87 scores of Cronbach's alpha (13). "Perceived mood changes" evaluated with the following single item: "what was the effect of the current contraceptive on your mood" and three responses "positive effects," "negative effects" and "no difference."

The approval of the respective Ethical Committee was obtained. Approval number of Ethics Committees of Tehran University of Medical Sciences: IR.TUMS.FNM.REC.1396.3209. dated: 2017.08.15

For data analysis, distribution, mean, and standard deviation values were initially obtained using descriptive statistics. Chi-square and independent t-test were used for the homogeneity of the two groups. Multivariate linear regression was conducted to estimate the strength of associations. The collected data was then captured in a Statistical Package for Social Sciences-22 software (SPSS Inc., Chicago, IL, USA) for further analysis.

## Results

Women were using IUD, and DMPA showed no significant differences in demographic characteristics. The mean of women and their husband's age were 33.7 and 38.3 years, respectively. The duration of marriage was 6-15 years in 52% of participants. The majority of women in the study had at least a high school diploma level of education (50%), were in average financial condition (50%), had cesarean section history in the last delivery (58%), and had two children (50%). Thirty percent of women were in the breastfeeding period (Table 1).

Table 1. Baseline characteristics of IUD and DMPA users

Characteristics	DMPA (N =150) Mean (SD)	IUD (N =150) Mean (SD)	P value
Women's age (year)	33.67 (5.08)	33.83 (5.98)	<b>0.81*</b>
Husband's age (year)	38.21 (6.42)	38.48 (7.03)	<b>0.72*</b>
Duration of marriage (year)	11.98 (6.25)	12.25 (7.07)	<b>0.73*</b>
	DMPA (N =150) N (%)	IUD (N =150) N (%)	
<b>Number of children</b>			
1	39 (26)	35 (23.3)	<b>0.47**</b>
2	78 (52)	70 (46.7)	
≥3	33 (22)	45 (30.0)	
<b>Women's education</b>			
Under high school diploma	39 (26)	35 (23.3)	<b>0.24**</b>
High school diploma	78 (52)	70 (46.7)	
Academic degree	33 (22)	45 (30.0)	
<b>Husband's education</b>			
Under high school diploma	55 (36.7)	44 (29.3)	<b>0.34**</b>
High school diploma	60 (40)	71 (47.3)	
Academic degree	35 (23.3)	35 (23.3)	
<b>Financial condition</b>			
Very weak	1 (0.7)	4 (2.7)	<b>0.18**</b>
Weak	29 (19.3)	35 (23.3)	
Average	72 (48)	75 (50)	
Good	42 (28)	27 (18)	
Very good	6 (4)	9 (6)	
<b>Delivery type</b>			
NVD	62 (41.3)	63 (42)	<b>0.90**</b>
CS	88 (58.7)	87 (58)	
<b>Lactation</b>			
Yes	51 (34)	40 (26.7)	<b>0.16**</b>
No	99 (66)	110 (73.3)	

\* Independent t-test, \*\* Chi-squared

Evaluation of sexual satisfaction with ISS revealed that mean and standard deviation of sexual satisfaction score in IUD users were 38.14 (18.18) in comparison of 45.56 (15.23) in DMPA group that indicated significantly higher sexual satisfaction in IUD consumers ( $p < 0.001$ ) (Table 2). Twenty-two percent of IUD users versus 7% of DMPA users reported a very high level of sexual satisfaction (Figure 1). The perceived sexual effect of the method over time was significantly different between the two groups ( $p < 0.001$ ). "Perceived sexual satisfaction changes" showed positive

changes in the sexual satisfaction reported in 18% of IUD and 3% of DMPA users (Table 2).

PHQ test showed that mean and standard deviation of depression score in IUD users were 4.43 (2.43) in comparison of 6.06 (3.54) in the DPA group that indicated significantly lower depression level in IUD consumers ( $p < 0.001$ ) (Table 2). Findings indicated that 62% of IUD users versus 44% of DMPA users were free of depression. "Perceived mood changes" were significantly different between two groups ( $p < 0.01$ ) (Figure 2).

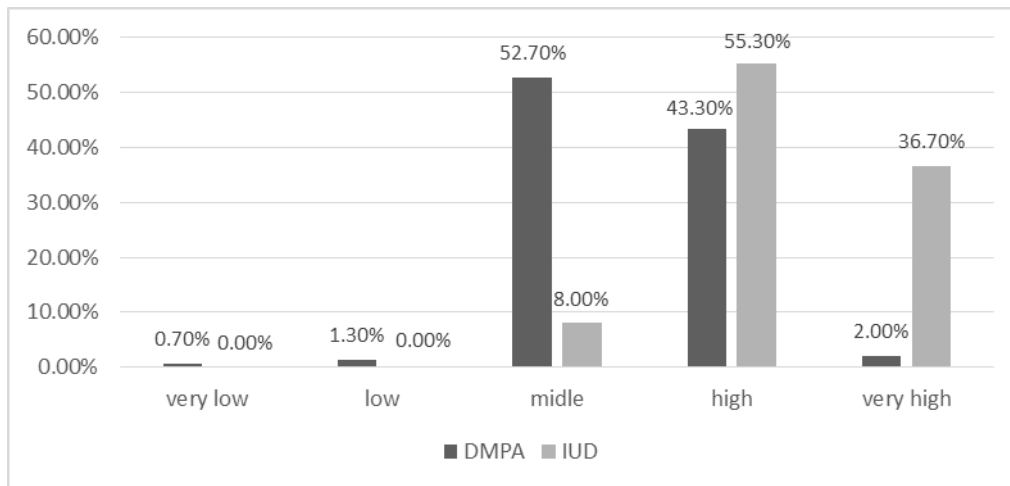


Figure 1. Comparison of sexual satisfaction percentage on IUD and DMPA users

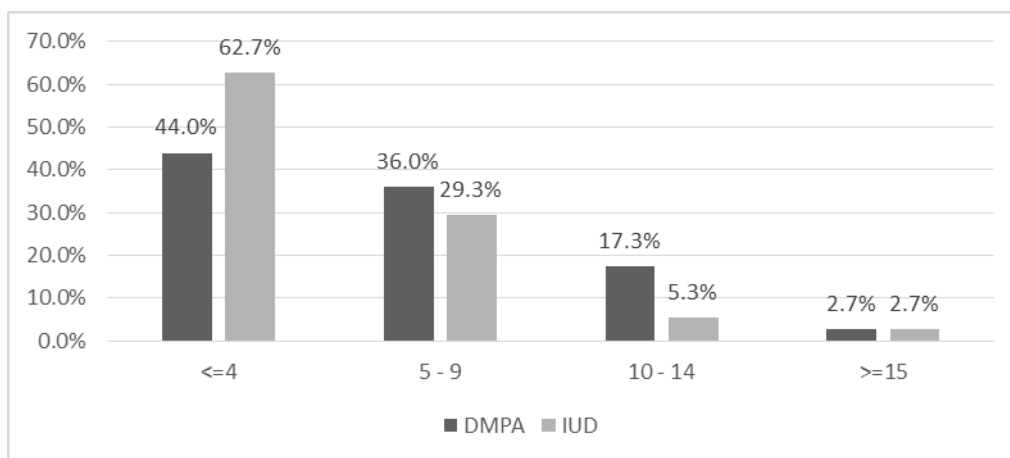


Figure 2. Comparison of depression percentage on IUD and DMPA users

Table 2. Compare of current depression and sexual satisfaction, perceived mood changes and perceived sexual satisfaction changes on IUD and DMPA users

		DMPA (N=150) Mean (SD)	IUD (N=150) Mean (SD)	P value
<b>Current depression<sup>1</sup></b>		6.1 (3.5)	4.4 (3.4)	<b>P&lt;0.001*</b>
<b>Current sexual satisfaction<sup>2</sup></b>		45.5 (15.2)	38.1 (18.1)	<b>P&lt;0.001*</b>
		DMPA (N =150) N (%)	IUD (N =150) N (%)	
<b>Perceived mood effects over the time<sup>3</sup></b>	Positive	1 (0.7)	3 (2)	<b>P&lt;0.01**</b>
	Negative	31 (20.7)	11 (7.3)	
	No difference	118 (78.7)	136 (90.7)	
<b>Perceived sexual effects over the time<sup>4</sup></b>	Positive	5 (3.3)	27 (18)	<b>P&lt;0.001**</b>
	Negative	25 (16.7)	3 (2)	
	No difference	120 (80)	120 (80)	

\*Independent t-test, \*\*Chi-squared, 1. Measured by PHQ-9, 2. Measured by ISS, 3 & 4. Measured by a single question

Adverse changes in mood reported in 21% of DMPA and 7.5% of IUD users during the 12-18 months after initiation of the methods (Table 2). Multivariate linear

regression was employed to predict the effects of some variables on sexual satisfaction (Table 3). Two factors of groups and duration of marriage were

meaningful effects on sexual satisfaction. A multivariate regression showed that sexual satisfaction changed 6.4 scores when the contraceptive method was IUD (P=0.003, B=-6.4). Sexual satisfaction changed 0.33 scores when the duration of marriage increased 1 year (P=0.02, B=0.33). Multivariate linear regression reconfirmed

that the method also had a meaningful influence on depression (Table 4). Depression changed 1.24 score when the contraceptive method was IUD (P=0.006, B=-1.24,). Other variables did not show any effects on depression in multivariate regression.

Table 3. Multiple linear regression analysis for variables predicting depression of women (N=300)

Model	Coefficients <sup>a</sup>		Standardized coefficients Beta	t	Sig.
	Unstandardized coefficients				
	B	Std. Error			
(Constant)	8.583	1.866		4.599	.000
Contraceptive (DMPA or IUD)	-1.244	.448	-.174	-2.776	.006
Duration of marriage	.051	.051	.096	1.010	.313
Weight changes	.123	.076	.099	1.610	.108
Sexual satisfaction (ISS)	.013	.012	.064	1.104	.270

a. Dependent variable: Depression (measured by PHQ)

Table 4. Multiple linear regression analysis for variables predicting sexual satisfaction of women (N=300)

Model	Coefficients <sup>a</sup>		Standardized coefficients Beta	t	Sig.
	Unstandardized coefficients				
	B	Std. Error			
(Constant)	53.652	4.603		11.656	.000
Contraceptive (DMPA or IUD)	-6.489	2.134	-.190	-3.041	.003
Duration of marriages	-.336	.144	-.132	-2.340	.020
Weight changes	.210	.367	.035	.572	.568
Depression (PHQ)	1.125	1.251	.052	.899	.369

a. Dependent variable: Sexual satisfaction (measured by ISS)

## Discussion

Our findings indicated that IUD users have higher sexual satisfaction than DMPA users. From the theoretical point, some non-sexual side effects of contraceptives such as changes in bleeding patterns, mood, weight, or breast tenderness could impact on woman's sexual life (14). Interestingly, despite significantly higher and longer menstrual bleeding patterns in IUD versus DMPA users (this side effect's changes will explain in other paper), no adverse effect on sexual satisfaction has been seen with this side effect. Similarly, in the systematic review of Sanders et al...., the results in five studies showed positive, five studies no effect, and one study mixed impact of IUD on sexual function and none of the studies reported any negative impact on sexual life (14). Our finding represents further support of Higgins et al.'s (2016) study that participants with IUD report improvements

to their sexual lives compared to baseline (7). Fewer sexual satisfaction in DMPA users could be due to the progesterone hormone component, some depression level is expected in DMPA users, and obviously, depression has adverse effects on sexual satisfaction (15). Despite the consensus of the positive effect of the IUD on consumer's sexual life, still, some challenge exists about DMPA. Boozalis et al. reported that lack of sexual desire was significantly higher in DMPA users in comparison to IUD users, probably due to suppression effects of progesterone on the production of estrogen and subsequent insufficiency in vaginal lubrication (6).

Our results also are in line with Smith et al. (16), and Higgins (17) that reported overall sexual pleasure in hormonal contraceptive users is significantly lower than non-hormonal users. However, some other researchers such as Ott et al. (8), Fortenberry (18) and Burrows (4) reported

no or small change in the sexual interest between DMPA users and non-users. It should be considered that in all of these studies, only sexual function aspects such as lubrication, libido or orgasm has been measured. However, It seems that contraceptive's side effects cause some environmental or interrelationship changes that do not necessarily affect sexual function but could decrease sexual satisfaction (5).

Our findings implied that IUD users have lower depression levels in comparison to DMPA users, and DMPA can hurt women's moods. These changes could be due to the progesterone component in DMPA. The relation between DMPA and negative mood changes showed in many studies (8, 10, 19). Another study showed that the association between DMPA and depression is valid only in the first year of using DMPA (9). However, a new systematic review reported that although many studies showed the relation between DMPA and depression, due to limitations exists in the trial we cannot support a clear relationship between DMPA and depression (20).

Some limitations should be considered in this research. Depression and sexual satisfaction are multifactorial phenomes, and we cannot attribute the existence differences to the contraceptive method. Also, we did not have any document about past sexual or depression conditions of participants and a single question cannot precisely show the changes over time about recall bias. In this study, we did not match two groups together, but we tried by recruiting equal numbers of IUD and DMPA users in each center and sampling from many centers overcome with this problem. Similar demographic characteristics between the two groups can imply to this claim. Also, the non-responses rate was high but we reached our sample size with non-significantly differences between influential factors on depression and sexual satisfaction in two groups.

## Conclusion

This paper displayed that both sexual satisfaction and mood were significantly better in the IUD group than DMPA consumers. The present study took a biopsychosocial look to sexuality and is one of the few researches that assessed sexual satisfaction in IUD and DMPA users. Our results indicated that change in the trend of DMPA and IUD using in favor of DMPA could not only attribute to the method's side effects and other probable items such as health provider's intention should be considered that need more researches.

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**Conflict of interest:** No

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