

## **IUD Survival and Its Determinants; a Historical Cohort Study**

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### **Abstract**

**Background:** IUD is one of the safest and most widely used reversible methods of contraception. The purpose of this study was to determine IUD survival and reasons for early discontinuation in Bandar Abbas, south of Iran.

**Methods:** Probability of IUD continuation rate and factors associated with discontinuation were assessed in a historical cohort study of 400 women records from March 2002 to February 2004. Data were collected from documents in health centers and interview with subjects. Life tables, Kaplan-Meier, log-rank test and cox regression model were used for data analysis.

**Results:** The continuation rate of using IUD at 6, 12, 18, 24, 30, 36, 42 and 48 month were 92%, 87%, 81%, 75%, 69%, 62%, 56% and 50%, respectively. Counseling and desire to becoming pregnant were associated with continuation rate ( $P < 0.03$ ). Furthermore the most important reasons for IUD discontinuation were side effects of IUD followed by pregnancy tendency, health concerns, expulsion, and unsatisfied with the method.

**Conclusion:** This study suggested that women should be fully informed about side effects of IUD before inserting it as well as during its using.

**Keywords:** *Intrauterine devices, Survival, Iran*

### **Introduction**

Using modern contraception methods in developing countries has been increased dramatically among women, from less than 10% in 1965-70 to over 50% in recent yr (1). In this regard, quality of family planning services is an important determinant that affects the continuation rate of contraception methods (2). So it is recommended that all health providers involved in family planning settings encourage more new clients to use effective contraception methods as well as advise old users to adhere to their recommendations (3). The extent to which users continue/discontinue a contraception method is an important indicator of its qual-

ity because the higher the discontinuation rate of contraception method, the higher the risk of unwanted pregnancies (3). It is argued that more than half of unwanted pregnancies, in 15 Asian countries, were due to either a contraceptive failure or a discontinuation rate (4). Among currently modern contraception, more than 100 million women in worldwide, use one kind of IUD which makes it as a single most popular reversible contraception method (1). In Iran approximately 55% of married women use modern contraceptives, that 8.5% of them use IUD (5). TCu-380A IUD has been a highly effective form of long-term reversible contraception-with a failure rate of 0.8% in the first year of its insertion and also one of the safest and most widely used methods of contraception that

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could prevent unplanned pregnancies in past 10 yr (6, 7). However early discontinuation, within the first year of IUD insert, is one of the most important disadvantages of it (8).

Quality improvement of a kind of contraception method is one of the most important goals of family planning programs and continuation rate might be a reliable indicator for overall quality of a contraception services presented by health care providers. However, high rates of discontinuation are generally recognized as a major problem facing family planning programs which offered to clients and there is a need to assess causing factors (4).

We sought to evaluate the continuation rates and reasons for early discontinuations in women receiving the TCu-380A IUD in Bandar Abbas, south of Iran.

### **Materials and Methods**

This study was a historical cohort which carried out in June and July 2006 and used records and interview with 400 women who inserted TCu-380A IUD from March 2002 to Feb 2004 in health centers affiliated to Hormozgan University of Medical Sciences in Bandar Abbas, Iran. The records were entered to the study through a multistage sampling method in which, firstly 17 health centers located in different areas of city were randomly selected and then in accordance with the covered proportional population by each center, the proportional number of records were randomly selected. Data documented in the records or collected by interview included sociodemographic characteristics, obstetric and contraceptive history (previously used contraception methods), data regarding IUDs inserted and reasons for early discontinuation. The study was approved by Medical Ethics Committee of Hormozgan University of Medical Sciences. Informed consent was obtained from all the subjects.

Data were analyzed by using SPSS13 software. To analyzing data, life tables were used to determine IUD survival, Kaplan-Meier and log rank tests were used to determine the IUD con-

tinuation rate related to different variables, and Cox regression analysis was used to determine the factors associated with IUD survival after controlling the effects of confounding variables.

### **Results**

The mean age of women was  $27.9 \pm 5.2$  within the range of (17-45) yr. The majority of women (35.5%) educated at high school level and the minority of them (6.8%) was at university level. Most of women (96.5%) were housewife. The mean number of pregnancies was  $2.1 \pm 1.1$  within the range of (1-7). The mean number of women's living children, sons and daughters were  $2 \pm 1.1$ ,  $1.1 \pm 0.91$  and  $0.91 \pm 0.87$ , respectively. Overall 322(80.5%) of women used different modern contraception methods before using IUD including oral pills (50.6%), condom (21.4%), IUD (3.2%) and other methods (28%). Generally, from women that were inserted IUD, 47.5% tended to become pregnant later, 92% were consulted before being inserted IUD, 89.8% were inserted by midwives, 10.2% by physicians. 65.5% of them were advised to use IUD by midwives, 26.5% by their own decisions, 5.8% by relatives and 2.3% by physicians. Table and Fig. 1 show IUD survival at different time intervals. As the results show the continuation rate of using TCu-380A IUD at 6, 12, 18, 24, 30, 36, 42 and 48 month were 92%, 87%, 81%, 75%, 69%, 62%, 56% and 50%, respectively. The relationships between mean continuation rate of IUDs and some variables are shown in Table 2. Accordingly, tendency to becoming pregnancy and being consulted while IUD insertion were associated with the risk of low mean continuation rate and early discontinuation of IUD ( $P= 0.03$ ).

The Cox regression analysis was used to determine the factors associated with IUD survival after controlling the effects of confounding variables. The variables which entered to the model included age, education, job, number of pregnancies, number of children, number of daughters/sons, using other contraceptives, tendency to becoming pregnant in the future and IUD

consultation. Among these variables entered to the model, only two of them were significantly associated with IUD survival including tendency to becoming pregnant in the future and IUD consultation. Accordingly women tended to becoming pregnant had a hazard ratio for continuation IUD approximately half times that of those with not tendency (OR= 0.67, CI= 0.47-0.96,  $P < 0.03$ ). Moreover women being consulted before IUD insertion were more likely to

continue IUD contraception method relative to those not being consulted (OR= 1.7, CI= 1.01-2.9,  $P < 0.04$ ).

31% of participants, that initially accepted IUD, discontinued using it. Among discontinuation reasons, the most common was side effects (82%) including bleeding, pain, expulsion, health concerns and dissatisfactions, followed by other reasons (18%) including accidental pregnancy (1.6%) and the desire to pregnancy (16.4%).

**Table 1:** IUD survival in participants from Mar. 2002 to Feb. 2004 (n = 400)

Time Interval (Month)	Entering Interval (n)	With drawing during interval (n)	Exposed to risk (n)	Terminal events (n)	Proportional surviving (%)	(95% CI)
0-6	400	1	399	30	0.92	0.90-0.94
6-12	369	1	368	22	0.87	0.83-0.91
12-18	346	50	321	23	0.81	0.77-0.85
18-24	273	69	238	18	0.75	0.71-0.79
24-30	186	54	159	13	0.69	0.63-0.75
30-36	119	40	99	10	0.62	0.56-0.68
36-42	69	32	53	5	0.56	0.48-0.64
42-48	32	18	28	2	0.50	0.40-0.60

**Table 2:** Comparison of mean IUD survival (month) in relation to different variables

Variables	Total N. (Discontinuation N.) (Month)	Mean± S.D(Month)	CI 95%	P
<b>Age (year)</b>				
<25	145 (103)	35.7 ±1.5	32.8-38.8	0.09*
25-30	146 (92)	33.3 ±1.5	30.3-36.3	
>30	109 (82)	37.6 ±1.6	34.6-40.7	
<b>Education</b>				
Illiterate	37 (11)	35.3 ± 2.7	29.9-40.6	0.37*
Primary school	95 (34)	35.1 ± 1.7	31.6-38.5	
High school	141(44)	34.5 ±1.5	31.5-37.5	
Diploma	100(31)	33.5 ±1.6	30.3-36.8	
University	27 (3)	39.2 ± 2.1	35.2-43.2	
<b>Job</b>				
Housewife	386(121)	35.4 ± 0.9	33.7-37.3	0.29*
Office worker	14 (2)	34.1 ± 2.6	28.8-39.1	
<b>Tendency to pregnancy</b>				
Yes	190(70)	33.7 ±1.3	31.2-36.3	0.03**
No	210(53)	37.6 ±1.2	35.2-40.1	
<b>To be consulted</b>				
Yes	368(107)	36.3 ± 0.9	34.5-38.1	0.03**
No	32 (16)	28.9 ± 2.2	24.5-33.3	
<b>IUD Insertion by</b>				
Physician	41 (9)	36.8 ± 2.2	32.3-41.1	0.29*
Midwife	359(114)	35.4 ± 0.96	33.4-37.2	
<b>Number of children</b>				
≤2	305(93)	35.5 ± 1.1	33.5-37.6	0.98*
>2	95 (30)	35.1 ± 1.8	31.6-38.7	

\* Non significant (NS)

\*\*Significant(S)

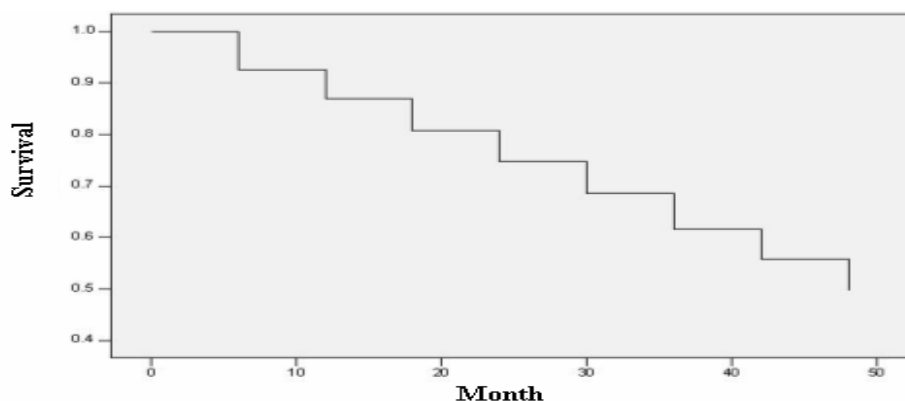


Fig. 1: IUD survival in participants from Mar. 2002 to Feb 2004

## Discussion

Reports from other studies has been conducted in other cities of Iran including Tehran, Isfahan and Tabrize, showed that the probability of IUD continuation at the end of first and second year of its insertion were apparently lower than what we found in present study (9-12). Despite these differences regarding continuation rates between different cities in Iran, studies conducted in Europe, United States and six developing countries have been shown results nearly similar to our results (8, 13, 14). A study conducted in Thailand showed that continuation rate of Tcu-380A IUD at the end of first year was 90.2% which was slightly higher than the continuation rate shown in this study (15). In the present study the continuation rate of TCu-380A IUD was about 50% at the end of fourth year whereas this is apparently less than the continuation rate at the end of fifth year shown in Meirik study (16).

The findings of this study showed counseling before starting to use IUD had positive affects on continuation rates. In family programs, counseling is a process that helps clients to make a decision regarding voluntarily using a kind of most suitable, effective and safest contraceptive method, so counseling strengthens the communication between counselor and clients through making higher confidence and intimacy and could enhance the successfulness of a method as whatever we concluded in this study. Nevertheless in most cases of IUD insertion counsel-

ing has been neglected. It is might be due to lacking enough time for counseling or lacking enough knowledge and positive attitude regarding its effectiveness on IUD continuation rate. According to the results, desire to becoming pregnant in future, was associated with lower continuation rate. So tendency to pregnancy should be consulted with women in consultation session. The most important reasons for early discontinuation of IUD in this study were side effects (82%) including bleeding, pain, expulsion, health concerns and dissatisfactions. This result is like to other similar studies (1, 8-10, 12). Planed pregnancy was the most common personal reason for early discontinuation of IUD in this study that was in accordance with other studies (1, 3, 14). This study showed a failure rate of 1.6% due to accidental pregnancies that was similar to the results of other studies like Janabi et al. (1.4%) and Rosenberg et al. (1.6%) (11, 12), but different from the results of Zamani et al. (6.2%) and Reinprayoon et al. (0.1%) (9, 14). In this study counseling was the most important predictor for higher continuation rates. Therefore educating health providers and arranging workshops regarding family planning and counseling skills are strongly recommended for improving health workers motivation to consult clients before IUD insertion. In addition because the most important reasons for early discontinuation of IUD were bleeding and side effects, so IUD continuation rate can be improved if IUD is recommended to eligible

women without any menstruation irregularity as well as providing clients with enough information about all side effects of IUD to persuade them regarding this kind of contraception. In conclusion, information in some records of IUD users was unclear or lack and we excluded them from the study. Moreover the study was carried out at least 2 yr after inserting IUD and some of women did not remember exactly the date and reasons for early discontinuation. So it is recommended that a study be done and include whom till inserting IUD and follow up them in specific time intervals and record any early discontinuation and its reasons exactly.

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