Contraception use and probability of continuation: community-based survey of women in southern Jordan

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استخدام موانع الحمل واحتمال المثابرة عليها: دراسة مسح مجتمعية في جنوب الأردن

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الخلاصـة: أُجريت دراسة مسح مجتمعية في تشرين الأول/أكتوبر 2003، لمعرفـة محـدِّدات استخدام موانـع الحمـل، واحتمال المثابرة عليها لمدة سنتين بين النسوة المتزوجات في سن الإنجاب في الكرك، جنوب الأردن. وقد وجـد أن 61٪ من المشاركات في الدراسة وعددهن 1109، سبق لهن استخدام موانع الحمل في 1389 فتـرة، ولمـدة وسـطية بلغت 24 شهـراً. وقد بلغت النسبة المئوية التراكمية للاستمـرار 92٪ خـلال 6 أشهـر، و65٪ خـلال 12 شهـراً، و42٪ خـلال 24 شهراً. ويعد كل مـن التقـدم في السن، وفترة الـزواج الطويلة، وعـدد الأولاد الأحيـاء الكبـير (22.5٪ منهـم كان لديه أكثر من العدد المثالي من الأطفال)، واستخدام اللوالب بشكل مستقل، من العوامل المنبِئـة بطول استخدام موانع الحمل. وقد كان تنظيم الحمل (74٪) أكثر سبب يصرح به لعدم المثابرة. وينبغي أن تركِّـز برامج تنظيم الأسرة على تقليص عدم المثابرة، مع التوصية بالطرق التي تزيد من احتمالات المثابرة.

ABSTRACT A community-based survey was conducted in October 2003 to investigate the determinants of contraception use and probability of 2 years continuation among ever married women of reproductive age in Karak, south Jordan. Of the 1109 participants, 61% were ever users of contraceptives in 1389 segments, median duration 24.0 months. The cumulative proportion of continuation was 92% at 6 months, 65% at 12 months and 42% at 24 months. Older age, longer duration of marriage, large number of surviving children and use of the intrauterine device independently predicted a longer duration of contraception use. Pregnancy planning (74%) was the most frequently stated reason for discontinuation. Family planning programmes should focus on reducing discontinuation and recommending methods with a higher probability of continuation.

Utilisation de la contraception et probabilité de sa poursuite : enquête communautaire dans le sud de la Jordanie
RÉSUMÉ Une enquête communautaire a été réalisée en octobre 2003 pour identifier les déterminants de l'utilisation de la contraception et la probabilité de sa poursuite pendant 2 ans chez des femmes en âge de procréer déjà mariées à Karak dans le sud de la Jordanie. Sur les 1109 participantes, 61 % avaient déjà utilisé des contraceptifs dans 1389 segments, la durée médiane étant de 24,0 mois. La proportion cumulative de la poursuite de la contraception était de 92 % à 6 mois, de 65 % 133 à 12 mois et de 42 % à 24 mois. L'âge plus avancé, la plus longue durée du mariage, le nombre important d'enfants survivants et l'utilisation d'un dispositif intra-utérin prédisaient de façon indépendante une plus longue durée d'utilisation de la contraception. La planification d'une grossesse (74 %) était la raison la plus fréquemment citée pour l'arrêt de la contraception. Les programmes de planification familiale devraient chercher à réduire l'abandon et recommander des méthodes ayant une plus forte probabilité de poursuite.

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Introduction

Since the United Nations International Conference on Population and Development, held 5–13 September 1994 in Cairo, Egypt, Jordan's record in advancing the reproductive health agenda has been mixed, yet family planning has been recognized as a top priority and has been identified as a key element in reducing fertility for all age groups and in many developing countries [1–3]. Moreover, family planning is one of the 6 interventions recommended by the World Health Organization to achieve safe motherhood with subsequent reduction of maternal and neonatal morbidity and mortality [4].

In Jordan, the provision of family planning services by the government sectors started in 1980, and since then use of contraception has become widespread. A steady increase in contraception use was observed among Jordanian women: the prevalence of use rose from 40% in 1990 to 53% in 1997, reaching 56% in 2002 [5]. In all population surveys, the proportion of women currently practising contraception is a routine component of monitoring and evaluation of family planning services. On a national level, however, few studies have included information on the ability or willingness of clients to persist with contraception [6]. Grady et al. pointed to the high rate of discontinuation of contraception as a major problem facing family planning programmes [7]. In Jordan, the most recent population and family health survey [5] revealed that 42% of women who are exposed to the risk of conception discontinue the method within 1 year of initial acceptance. The rate for continuation of contraception is one of the major indicators of the quality of use and programme success [8].

The purpose of this study is to determine the rate of continuation of contraception and reasons for discontinuation as well as to identify the variation in continuation for different methods and different client types. This information is essential for programme managers to provide quality service and to ensure the success of family planning programmes.

Methods

A community-based survey was conducted in Al-Karak governorate in the southern region of Jordan in October 2003. Administratively, Al-Karak governorate is divided into 7 districts, each of which has a number of villages.

This study is part of a more extensive survey of the duration and determinants of interbirth interval and contraceptive use. The target population for the current survey was ever married women of reproductive age (15–49 years). Eligibility criteria for inclusion were being ever married and having at least 1 child as women are not likely to opt for contraception before the birth of the first child.

A total of 1109 women were enrolled in the study using the multistage sampling technique. Estimation of sample size and sampling procedure are given elsewhere [9] based on methods described by Lwanga et al. [10] and taking into account contraceptive use in the region [5].

Participants were interviewed in their own homes using a pre-tested questionnaire to collect relevant information. The questionnaire included questions on:
- sociodemographic data, including couple's age, level of education, husband's occupation, woman's working status and current marital status;
- reproductive history, including age at marriage; number of pregnancies, deliveries and miscarriages; history of child

death; number and sex of surviving children, woman's ideal preference regarding number of children;

- use of modern contraceptive methods, both current and ever use; inquiry was made into the use of modern contraception following each pregnancy (which represents a segment of contraception use), type of method used, duration of use and reason for discontinuation.

In view of the lack of any register for contraception use, the dates of commencement and termination of contraception use were based on women's recall. To ensure the accuracy of the reported duration of contraception use, the date of childbirth was obtained from the family register. The starting date was estimated by asking the women, "How many months after the birth of this child did you opt for contraception?" The date of termination was estimated by asking, "How many months did it take to conceive following discontinuation of contraception?" The dates were recorded in years and months from which the duration of use was calculated. Switching to another contraceptive method was encountered in a few segments and was considered a new segment of use.

Data processing and analysis were performed using *SPSS*, version 10. Two data files were created. The first represented the unit of inquiry, namely women interviewed while the second represented the "segments" of contraception use reported by ever users. A segment is considered closed by the discontinuation of the method while if contraception is maintained, the segment is considered open and the observation is then censored. Data were presented using the mean, standard deviation and corresponding 95% CI of the mean. The univariate logistic regression analysis was applied for computing the odds ratio and the 95% CI. Analysis of the mean duration of con-

traception use, the determinants of use and the probability of continuation was performed using life table, Kaplan–Meier survival estimates and univariate and multivariate Cox regression analyses, which are suitable for censored observation. Significance was considered at the 5% level.

Results

A total of 1109 ever married women of reproductive age were enrolled in the study. Mean age was 32.4 years [standard deviation (SD) 7.1], minimum 18 years and maximum 49 years. The majority of women (78.9%) and their husbands (79.7%) had completed ≥ 9 years of education. Just over a quarter of the women had been employed for variable periods of time during their years of marriage and 21.0% were currently working. More than a third of the husbands were employed by the army and 27.6% were either professionals or semi-professionals (Table 1).

The majority of women (98.3%) were in a marital union at the time of the survey. Mean age at marriage was 21.4 years (SD 3.9; median 21 years). The number of children ranged from 1 to 13, with a mean of 3.9 (SD 2.4) children per woman. Nearly half the women (48.0%) stated an ideal preference of 4 for number of children. Women who stated an ideal preference of > 4 children constituted 39.9% of the sample and 12.1% had an ideal preference for 2 or 3 children. Only 19.8% of women had the number of children that matched their ideal preference. Just over half the women (57.7%) had not reached their ideal preference, while 22.5% had exceeded their ideal preference. Women who exceeded their ideal preference were significantly older, 38.9 years (SD 5.9; 95% CI: 38.2–39.7) compared to 34.6 years for those who had

the number of children matching their ideal preference (SD 6.0; 95% CI: 33.8–5.4) and 29.2 years (SD 5.7; 95% CI: 28.7–29.6) for those who had fewer children than their ideal preference. Moreover, women who exceeded their ideal preference for number of children had been married for a significantly longer duration, 19.3 years (SD 6.1; 95% CI: 18.5, 20.0), than those who had their ideal number of children, 13.3 years (SD 5.8; 95% CI: 12.6–14.1), or had fewer than their ideal number, 7.1 years (SD 5.0; 95% CI: 6.7–7.5).

Excluding women who were pregnant and those who were no longer in a marital union, 40.8% of the women in the survey were current users of modern contraceptives. However, 61.3% reported ever use in 1 or more segments. For both ever users and current users, the intrauterine device (IUD) was the commonest method of contraception, followed by pills and condoms. Only 9 women opted for tubal ligation (Table 2).

Table 3 shows contraception use in relation to couple's characteristics. The proportion of ever users of modern contraception increased significantly with the increase in the level of education of the women (chi-squared for linear trend = 7.967; P = 0.00476) and their husbands (chi-squared for linear trend = 8.863; P = 0.00291). Couples who had 9 or more years of education each were nearly 2 times as likely to report ever use of modern contraceptive methods compared to those who did not receive any formal education. Women who reported ever use of modern contraceptives were significantly older, married for a significantly longer duration and had a significantly greater number of children compared to never users. In contrast, ever use of modern contraceptives was not significantly associated with women's working status or husband's occupation.

Table 1 **Characteristics of the survey participants**

Characteristic	No. (*n* = 1109)	%
Woman's educational attainment		
No formal education	103	9.3
Primary (6 years)	131	11.8
Preparatory (9 years)	292	26.3
Secondary (12 years)	262	23.6
University or higher (> 12 years)	321	28.9
Husband's educational attainment		
No formal education	64	5.8
Primary (6 years)	161	14.5
Preparatory (9 years)	354	31.9
Secondary (12 years)	318	28.7
University or higher (> 12 years)	212	19.1
Husband's occupation[a] *(n = 1104)*		
Professional & semi-professional	305	27.6
Skilled & semiskilled	106	9.6
Military[b]	404	36.6
Manual	108	9.8
Other[c]	181	16.4
Woman's work status		
Worked before marriage	275	24.8
Worked during marriage	300	27.0
Currently working	233	21.0
Woman's marital status		
Married	1091	98.3
Widowed	13	1.2
Divorced or separated	5	0.5

[a]*Excluding those who have never been employed.*
[b]*Military represents those who did not have any formal education or received some school education and are employed by the army.*
[c]*Includes traders, drivers, farmers and shepherds.*

The study of contraception use extended to include the duration of use and the probability of 2-years continuation. Among ever users, reversible modern contraceptives were used in 1389 segments for a

mean duration of 40.4 months [standard error (SE) = 1.6; 95% CI: 37.2–43.6] and a median of 24 months (SE = 0.2; 95% CI: 23.6–24.4). The cumulative proportion of women who continued contraception use at 6 months was 92.4%, falling to 64.9% at 12 months and 42.5% at 24 months.

Analysis of the segments of use of reversible modern contraceptive methods in relation to women's characteristics at the beginning of the segment of use is displayed in table 4. The shortest duration of contraception use, for a mean of 25.1 months, was for segments starting before the age of 25 years and within the first 5 years of marriage (mean 24.8 months). In contrast, segments of use starting after the age of 35 years and for ≥ 15 years of marriage extended for around 87 months. The risk of discontinuation of contraception decreased significantly with the increase in women's age and duration of marriage at the beginning of the segment of use, as indicated by the hazard ratio.

A statistically significant difference was observed in the cumulative proportion of continuation of contraception in relation to women's age and duration of marriage. For segments starting after the age of 35 years, the cumulative proportion of continuation was 80.5% at 12 months and 73.5% at 24 months. For those starting before age 25 years, the cumulative proportion of continuation decreased to 55.4% at 12 months and 29.1% at 24 months. Similarly, the cumulative proportion of continuation was 79.7% at 12 months and 70.1% at 24 months for segments starting after 15 years of marriage, whereas it was 52.3% at 12 months and 27.3% at 24 months for segments starting within the first 5 years of marriage (Table 5).

Mean duration of contraception use was the shortest, 20.2 months, for segments in which the woman had only 1 child, and peaked at 57.3 months for segments in which the woman had 4 or more surviving children. The likelihood of discontinuation of contraception decreased significantly when there were 2 surviving children (hazard ratio = 0.69) or 3 (hazard ratio = 0.56) and was lowest in segments where the number of surviving children was ≥ 4 (hazard ratio = 0.39). Sex composition of surviving children was significantly associated with the duration of contraception use. Segments starting with both boys and girls

Table 2 **Use of modern contraceptive methods**

Use of modern contraceptives	No.	%
Ever use (n = 1109)		
Never user	429	38.7
Ever user	680	61.3
Type ever used[a]		
IUD	382	56.2
Pills	320	47.1
Condoms	111	16.3
Injectables	49	7.2
Local spermicides	13	1.9
Tubal ligation	9	1.3
Implants	5	0.7
Current use[b] (n = 1001)		
Non users	593	59.2
Users	408	40.8
Type currently used		
IUD	193	47.3
Pills	117	28.7
Condom	67	16.4
Injectables	19	4.7
Tubal ligation	9	2.2
Implants	2	0.5
Local spermicides	1	0.2

[a]*Categories are not mutually exclusive.*
[b]*Excluding women who reported being pregnant or no longer in a marital union.*
IUD = intrauterine device

Table 3 **Ever use of modern contraceptive methods in relation to the demographic characteristics of the participants**

Demographic characteristic	Use of modern contraception				OR[a]	95% CI[a]
	Never (*n* = 429)		Ever (*n* = 680)			
	No.	%	No.	%		
Woman's education						
No formal education[b]	51	11.9	52	7.6	1	
6 years	64	14.9	67	9.9	1.03	0.61–1.72
9 years	106	24.7	186	27.4	1.72	1.09–2.71
12 years	89	20.7	173	25.4	1.91	1.20–3.03
> 12 years	119	27.7	202	29.7	1.66	1.06–2.61
Husband's education						
No formal education[b]	35	8.2	29	4.3	1	
6 years	78	18.2	83	12.2	1.28	0.72–2.30
9 years	125	29.1	229	33.7	2.21	1.29–3.79
12 years	113	26.3	205	30.1	2.19	1.27–3.77
More than 12 years	78	18.2	134	19.7	2.07	1.18–3.65
Husband's occupation						
Professional & semi-professional	107	24.9	198	29.1	1.24	0.94–1.63
Other[b,c]	322	75.1	482	70.9	1	
Woman' work status during marriage						
Not working[b]	320	74.6	489	71.9	1	
Working	109	25.4	191	28.1	1.15	0.87–1.51
	Mean (SD)		**Range**		**95% CI**	
Woman's age (years)						
Never user	31.45 (7.595)		19–49		30.73–32.17	
Ever user	33.07 (6.701)		18–49		32.56–33.57	
Duration of marriage (years)						
Never user	9.85 (7.876)		1–35		9.10–10.59	
Ever user	11.85 (6.992)		1–34		11.32–12.38	
No. children surviving						
Never user	3.42 (2.512)		1–13		3.18–3.66	
Ever user	4.25 (2.266)		1–13		4.08–4.42	

[a]*Odds ratio (OR) and 95% confidence interval (CI) are computed from univariate logistic regression analysis.*
[b]*Reference category.*
[c]*Includes all other occupational categories.*
SD = standard deviation.

extended for a mean duration of 45.9 months. The risk of discontinuation of contraception was 1.79 times that in the presence of girls only, while it was 1.5 times that in the presence of boys only. Although the duration of contraception use

Table 4 **Mean duration of contraception use in relation to women's characteristics, child's variables and method of contraception in the segment of use**

Variable	No. of segments (*n* = 1389)	%	Mean duration (months)	SE	95% CI	Hazard ratio	95% CI
Woman's age (years)							
< 25[a]	420	30.2	25.1	1.02	23.05–27.07	1.00	
25–35	872	62.8	42.2	2.07	38.18–46.30	0.66	0.58–0.75
> 35	97	7.0	87.5	8.03	71.74–103.21	0.25	0.17–0.35
Duration of marriage (years)							
1–[a]	630	45.4	24.8	0.91	22.98–26.56	1.00	
5–	662	47.7	49.2	2.67	43.92–54.39	0.56	0.49–0.64
≥ 15	97	6.9	86.4	8.86	69.03–103.78	0.25	0.18–0.36
Woman's employment status							
Not working[a]	1037	74.7	39.9	1.82	36.36–43.51	1.00	
Working	352	25.3	40.1	2.80	34.62–45.58	0.97	0.84–1.12
No. of children surviving							
1[a]	221	15.9	20.2	1.30	17.67–22.76	1.00	
2	337	24.3	27.9	1.24	25.45–30.32	0.69	0.57–0.83
3	295	21.2	36.5	2.41	31.78–41.24	0.56	0.46–0.68
≥ 4	536	38.6	57.3	3.42	50.55–63.96	0.39	0.32–0.46
Children's sex							
Only girls	207	14.9	25.1	2.59	20.02–30.19	1.79	1.51–2.13
Only boys	294	21.2	28.0	1.57	24.94–31.08	1.51	1.29–1.76
Boys and girls[a]	888	63.9	45.9	1.98	42.02–49.77	1.00	
Child death							
No[a]	1379	99.3	40.6	1.64	37.35–43.78	1.00	
Yes	10	0.7	23.5	4.44	14.79–32.20	1.42	0.74–2.76
Type of contraception							
IUD[a]	583	41.9	51.9	2.90	46.20–57.58	1.00	
Pills	515	37.1	29.6	1.72	26.26–33.00	1.71	1.48–1.97
Condom	217	15.6	30.8	1.80	27.29–34.35	1.44	1.04–1.99
Injectables & implants	61	4.4	34.0	5.15	23.95–44.12	1.44	1.19–1.74
Local spermicidals	13	0.9	18.7	5.10	8.65–28.66	2.45	1.39–4.39

[a]*Reference category.*
SE = standard error.
CI = confidence interval.
IUD = intrauterine device.

was shorter in segments in which women experienced the loss of a child, the risk of discontinuation of contraception was not statistically significant (Table 4).

There was a statistically significant difference in the 2-year cumulative proportion of continuation of contraception in relation to the number and sex of surviving chil-

dren. The cumulative proportion of continuation in segments in which women had only 1 child was 87.8% at 6 months, 41.7% at 12 months and 18.1% at 24 months. The cumulative proportion of continuation of contraception at 6 months, 12 months and 24 months increased with increase in the number of surviving children to reach 93.7%, 75.4% and 56.0% respectively in segments where the number of

Table 5 **Probability of 2 years continuation of contraception in relation to women's characteristics, child's variables and type of contraceptive method in the segment of use**

Variable	Cumulative probability of continuation				Wilcoxon (Gehan) statistics
	6 months	12 months	18 months	≥ 24 months	
Woman's age (years)					
< 25	0.8872	0.5538	0.5399	0.2907	74.48
25–35	0.9372	0.6777	0.6627	0.4587	*P* < 0.0001
≥ 35	0.9582	0.8054	0.8054	0.7347	
Duration of marriage (years)					
1–	0.9109	0.5234	0.5140	0.2733	115.65
5–	0.9335	0.7449	0.7254	0.5294	*P* < 0.0001
≥ 15	0.9371	0.7974	0.7974	0.7012	
Woman's employment status					
Not working	0.9154	0.6395	0.6268	0.4215	1.06
Working	0.9476	0.6755	0.6590	0.4342	*P* = 0.3025
Number of children					
1	0.8785	0.4172	0.4069	0.1806	113.31
2	0.9250	0.6138	0.6026	0.3499	*P* < 0.0001
3	0.9298	0.6701	0.6661	0.4454	
≥ 4	0.9375	0.7537	0.7318	0.5604	
Children's sex					
Only girls	0.9096	0.4468	0.4410	0.2464	65.64
Only boys	0.9043	0.5906	0.5826	0.3185	*P* < 0.0001
Boys & girls	0.9331	0.7148	0.6974	0.5018	
Child death					
No	0.9238	0.6484	0.6346	0.4262	0.49
Yes	0.9000	0.6882	0.6882	0.2294	*P* = 0.4828
Type of contraception					
IUD	0.9755	0.7793	0.7653	0.5472	101.46
Pills	0.8722	0.5143	0.4959	0.3029	*P* < 0.0001
Condom	0.9308	0.6564	0.6506	0.3966	
Injectables & implants	0.8477	0.5869	0.5869	0.4157	
Local spermicidals	0.8462	0.2538	0.2538	0.1692	

IUD = intrauterine device.

surviving children was ≥ 4. In segments in which there were both boys and girls in the family, the cumulative proportion of continuation was highest at 6 months (93.3%), 12 months (71.5%) and 24 months (50.2%) (Table 5).

The longest mean duration of contraception use was observed in segments in which women opted for an IUD (51.9 months). The risk of discontinuation of contraception was about 1.5 times as high in segments where pills, condoms, injectables or implants were used and 2.5 times as high for local spermicidals (Table 4). Segments of contraception use in the 5 years preceding the survey lasted for a mean duration of 60.6 months (SE = 8.3; 95% CI: 44.5–76.9) which is significantly longer than the 35.1 months for segments that started earlier (SE = 1.4; 95% CI: 32.4–37.8). The risk of discontinuation of contraception for older segments was 1.5 times that of segments starting in the 5 years preceding the survey (hazard ratio = 1.5; 95% CI: 1.3–1.7).

The cumulative proportion of continuation for women using the IUD was 97.5% at 6 months, 77.9% at 12 months and reaching 54.7% at 24 months (Table 5). This was significantly higher than for women using pills (paired Gehan statistics = 91.79; $P < 0.0001$), condoms (paired Gehan statistics = 17.49; $P < 0.0001$), injectables or implants (paired Gehan statistics = 8.11; $P = 0.0044$) as well as local spermicidals (paired Gehan statistics = 13.31; $P = 0.0003$).

Of the 1389 segments of use, contraception was discontinued in 71.3% (990) of these segments. Planning for a pregnancy was the most frequently stated reason for discontinuation (75.5%). Experiencing side-effects such as menstrual changes, pelvic inflammation, headache and weight gain or fear of adverse effects on fertility came next (16.1%), followed by unplanned pregnancy resulting from method failure (5.4%). In only 3.2% of segments was discontinuation related to personal issues such as not feeling comfortable with the method, absence of the husband or husband's objection for continuation. Discontinuation of contraception because of experiencing side-effects or fear of adverse effects on fertility was more frequently encountered in segments where injectables or implants were used (32.5%) followed by the IUD (19.0%) and pills (17.3%). Contraception failure was most commonly encountered in segments where local spermicidals were used (41.7%) (Table 6).

Table 7 portrays the results of the multivariate Cox regression analysis identifying the independent predictors of duration of contraception use. Considering all significant predictors, longer duration of use is independently predicted by older age of the woman, longer duration of marriage and greater number of surviving children as well as the use of the IUD as a contraceptive method.

Discussion

A steady increase in contraception use has been reported among Jordanian women in the last 12 years [5], although considerable variation does exist between different regions. Among women in the central region, the prevalence of current contraception use was 58%. This proportion fell to 54% among women in the northern region and reaches its lowest level, 48%, among women in the southern region. The differentials in the use of modern contraceptives followed the same pattern [5]. The rate of current use of modern contraceptives (40.8%) among women in Al-Karak governorate indicates that these women lag be-

hind their counterparts in other regions of the country in this respect. Moreover, this is much lower than the 56% fixed for the year 2000 to achieve safe motherhood from which both the mother and infant benefit equally [4].

On a national level, 81% of women were ever users of modern contraceptives [5]. This rate is much higher than the 61.3% revealed in the current survey. Couples who had had 9 or more years of formal education each were more likely to report ever use of modern contraceptives. Several studies have documented the role of education in this respect [2,3,11–13]. Education is likely to influence contraception use through its effect on women's preference for small family size, desire to be gainfully employed and the attainment of higher socioeconomic status.

In the present survey, reversible modern contraceptives were used in 1389 segments for a median duration of 24 months. It has been observed that Jordanian women tend to persist with contraception: segments of use in the 5 years preceding the survey were significantly longer than earli-

er ones. Nevertheless, a third of the couples discontinue within 1 year of acceptance and about half do so within 2 years. Jordan is no exception in this respect as a study of contraception use in 6 developing countries, Ecuador, Egypt, Indonesia, Morocco, Thailand and Tunisia revealed similar findings [6].

Current contraception use is the net difference between acceptance and discontinuation. It is in fact a dynamic process, involving the decision to adopt contraception, the selection of the method and over time the decision to continue or discontinue contraception use. The nature of behaviour relating to contraception is complex as it is affected by a large set of factors and shows considerable variation throughout the childbearing period [14].

Contraception practice is mainly governed by women's reproductive status: the combined impact of age [3,12,15], duration of marriage [11] and number of surviving children [3,12,15]. Surveys conducted in Egypt [16], Pakistan [17] and Bangladesh [18] revealed that women over the age of 30 years consistently maintain higher con-

Table 6 **Reasons stated for discontinuation of contraception**

Reason for discontinuation	Type of contraception									
	Pills (n = 398)		IUD (n = 390)		Condom (n = 150)		Injectable & implant (n = 40)		Local spermicidal (n = 12)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Planned pregnancy (n = 747)	292	73.4	294	75.4	131	87.3	25	62.5	5	41.7
Side-effects or fear of adverse effect on fertility (n = 159)	69	17.3	74	19.0	2	1.3	13	32.5	1	8.3
Contraception failure (n = 53)	26	6.5	12	3.1	9	6.0	1	2.5	5	41.7
Personal issue (n = 31)	11	2.8	10	2.6	8	5.3	1	2.5	1	8.3

IUD = intrauterine device.

Table 7 **Independent predictors of duration of contraception use**

Independent predictor	Regression coefficient	Hazard ratio	95% CI	P-value
Woman's age (years)				
< 25[a]				
25–35	−0.1420	0.87	0.75–0.98	0.0594
> 35	−0.6821	0.51	0.34–0.76	0.0009
Duration of marriage (years)				
1–[a]				
5–	−0.3424	0.71	0.59, 0.85	0.0003
≥ 15	−0.6078	0.54	0.34, 0.88	0.0132
Method				
Different methods[a]				
IUD	−0.3559	0.70	0.61, 0.80	< 0.0001
Number of children	−0.0588	0.94	0.89, 0.99	0.0470

[a]*Reference category.*
CI = confidence interval.
IUD = intrauterine device.

tinuation rates. These findings are consistent with that of the current survey. Generally, women opt for contraception either to end childbearing or to maintain adequate spacing [*11*]. It is then expected to observe an ever use of modern contraceptives, longer duration of use and lower probability of discontinuation among older women who have been married for a longer duration as they tend to use contraception to end childbearing. In contrast, younger women who have been married for a short duration may have a tendency to use contraception for child spacing as they are still in the phase of family formation.

Previous studies have indicated the higher likelihood of discontinuation of contraception among women of low parity [*18*] and those who had not achieved their desired family size at the start of the segment of use [*6*]. The vast majority of the women in this survey expressed an ideal preference of 4 or more children. This explains the short duration of use and the

higher probability of discontinuation among women who have 3 or fewer surviving children in the segment of use. In fact, Asari suggested that family size preference is apparently more important than preference about sex of children in determining contraception use [*19*]. It is true that Jordanian women express a higher preference for sons [*5*] yet, the duration of contraception use and the likelihood for continuation was almost the same whether there were only sons or only daughters in the family. This finding is in disagreement with previous reports which documented the influential role of sons in the initial acceptance and maintenance of contraception use [*18,20*]. Rahman et al. observed that parental preference is not monotonically son-biased but is rather for a balanced composition of sons and daughters [*21*]. The current survey revealed that the representation of both sexes among surviving children was significantly associated with longer duration of contraception use and lower probability of dis-

continuation. It is not unlikely that women who have both boys and girls are also those who have a larger number of surviving children. Actually, the effect of sex composition of surviving children was eliminated when the number of surviving children was considered.

Chowdhury, Fauveau and Aziz and Rahman pointed out the negative effect of infant mortality on the initial acceptance and continuation of contraception use [18,22]. In the present study, segments in which women experienced the loss of a child were relatively short with high probability of discontinuation; this was not, however, statistically significant owing to the very few events reported.

The specific contraception method that women use varies substantially from country to country, but IUDs, pills and injectables are the most widely used methods by women in developing countries [3]. The current survey as well as a previous one [5] pointed to the high popularity of IUDs among Jordanian women. For properly screened women, the IUD is an excellent contraceptive choice as it is safe and effective [6]. This survey revealed that the IUD is associated with the longest duration of use and the highest probability of continuation at 2 years. A high rate of continuation among IUD users has been reported in previous surveys [5,6,23,24]. It has been postulated that women's fertility intentions govern their choice of method [19]. Women who are highly motivated to avoid pregnancy and those who wish to end childbearing are more likely to opt for an IUD [15]. Also, IUD discontinuation requires a conscious decision and a clinic procedure [6]. Generally, methods not affected by women's compliance such as IUDs, injectables and implants are characterized by high rate of continuation [25] and lower probability of failure [5,26]. In

this survey, method failure was reported in nearly 4% of segments, being lowest for IUDs, injectables and implants.

The main reason given for method discontinuation was planned pregnancy. This was expected as in the majority of segments of contraception use the women were below the age of 30 and had 3 or fewer children. Besides planned pregnancy, side-effects and health concerns played an important role in discontinuation of contraception among Jordanian women [5,26] and in women elsewhere [6,16,27]. This reason was associated with the highest rate of discontinuation within the first year of use. In contrast to a study in Egypt which reported high frequency of side-effects among pill users, prompting discontinuation [16], this survey identified the highest rate of side-effects and concerns about adverse effects on fertility in segments in which IUDs, injectables or implants were used. This finding indicates that maintenance of contraception use does not necessarily imply client satisfaction.

Health care professionals need to provide counselling regarding contraceptive method before and during use. To improve the rate of continuation, they should discuss possible side-effects and personal concerns with their clients and mitigate any misconceptions related to the selected method. It was pointed out in the *Jordan population and family health survey 2002* that 70% of users were informed about side-effects and only 55% were instructed about what to do when they experienced any [5].

In all initial visits, physicians should dedicate more time in obtaining a health history, inquiring into women's fertility intentions in addition to a medical examination in order to recommend the most suitable method. Whenever appropriate, IUDs and injectables should be recommended since

they are associated with the lowest probability of discontinuation. Methods with known high rates of failure resulting from faulty application should be avoided, particularly for women who intend to end childbearing and where safe abortion is not acceptable, as is the case in Jordan. Users of pills, condoms and local spermicides should be informed about emergency contraception and encouraged to use it whenever the possibility of conception is suspected. In all return visits, inquiry should be made regarding side-effects and satisfaction. Women who fail to attend clinics for renewal of supplies should be contacted and the reason investigated. Information, education and communication activities should be intensified in the southern region of the country, stressing ideal preference and the importance of continuation.

As fertility is declining in Jordan [5], family planning programmes would profit from a shift in emphasis to reducing discontinuation [28]. Further research is needed to reveal women's knowledge and attitude regarding emergency contraception and satisfaction with the service provided.

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