

## Contraceptive Methods: Cost/Effectiveness Ratio from a Customer's Perspective in Palestine

طرق منع الحمل: نسبة التكلفة الى الفاعلية من منظور المستهلك الفلسطيني

Waleed M. Sweileh\*, Abdelrahim M. Barham\*\*

\*College of Pharmacy, An-Najah National University, Nablus, Palestine.

E-mail: waleedsweileh@yahoo.com

\*\*Dept. of Statistics, Faculty of Science, An-N. National University, Nablus, Palestine.

E-mail: barham@najah.edu

Received: (26/9/2002), Accepted: (15/4/2003)

### Abstract

The purpose of the study was to determine the clinical and economic impact of alternative contraceptive methods to be used by women in Palestine. Effectiveness of the various tested methods was obtained from literature survey. Direct medical costs (medical consultation and drug costs) per user per day of use associated with six modern contraceptive methods were modeled from the perspectives of the Palestinian customer. Cost data were drawn from community pharmacies price list dated August 2002. Cost-effectiveness analysis shows that the most cost-effective (C/E) methods were intrauterine device (IUD) and injectable Depo-Provera® while the least cost-effective methods were the progestin only and combined oral contraceptive pills. The pharmacoeconomic analysis of the data shows that over one year of use per 1000 patients, the IUD method makes 35,000 USD of savings compared to progestin only pills (POP) and 19,000 USD of savings compared to combined oral contraceptive pills (COC). This pharmacoeconomic evaluations of the available fertility modulating methods and devices should assist the Palestinian married women and health professionals in rational selection of contraceptive method.

### ملخص

هدف هذه الدراسة هو تحديد التأثير الطبي والاقتصادي لطرق منع الحمل المختلفة التي تستعمل في فلسطين. فعالية الطرق المختلفة لمنع الحمل تم تحديدها بواسطة مراجعة النشرات العلمية والدراسات المسحية الموثقة والمنشورة. أما التكلفة الطبية المباشرة لطرق منع الحمل المختلفة (الإستشارة الطبية مضافاً إليها سعر الدواء) فقد تم حسابها لست (٦) طرق مختلفة لمنع الحمل. لقد تم تحديد الأسعار والتكلفة الطبية بناءً على قوائم أسعار الأدوية المعتمدة في صيدليات المجتمع في فلسطين بتاريخ شهر آب ٢٠٠٢. ان التحليل (نسبة التكلفة/الفاعلية) قد أظهر أن اللولب والحقن طويلة المفعول هي الأفضل للمستهلك الفلسطيني من حيث نسبة التكلفة/الفاعلية. في حين أن حبوب منع الحمل بأنواعها كانت الأسوء من حيث نسبة التكلفة/الفاعلية. ان الجدوى الاقتصادية لهذه الدراسة تشير الى أنه يمكن توفير ٣٥٠٠٠ دولار سنوياً اذا تم استعمال اللولب بدل حبوب منع

الحمل المحتوية على البروجيسترون ويمكن توفير ١٩٠٠٠ دولار سنوياً إذا تم استعمال اللوالب بدل حيوب منع الحمل المحتوية على البروجيسترون والايستروجين. ان هذه الدراسة الصيدلانية الإقتصادية ستعمل على مساعدة المرأة الفلسطينية والعاملين في الحقل الطبي على اختيار أفضل طرق منع الحمل من حيث نسبة التكلفة/الفاعلية.

## Introduction

There are various contraceptive methods available for the public in Palestine. These methods have different costs and effectiveness (preventing unintended pregnancies). Some of these methods are sold on a ‘*Prescription Only*’ basis (e.g. oral contraceptive pills (OCP), injectables (Depo-Provera®) and intrauterine devices (IUD)) while others are sold on an ‘*over-the-counter*’ (OTC) basis (e.g. condoms and spermicidal agents). In Palestine, the recent statistical publications of *Palestinian Central Bureau of Statistics* (PCBS) have shown that approximately 54% of the currently total married women (272,000) use contraceptive methods. 19.7% of those who currently do not use any contraceptive method do so because of contraceptive adverse effects or costs or inconvenient use. Of those who use contraceptive methods, 71.5% use modern methods (IUD, pills, condoms, injections and sterilization) while 28.5% use conventional methods (periodic abstinence, breast feeding and withdrawal). About 12% of those who use modern contraceptive methods directly got the device/drug from community pharmacies while the rest started the contraceptive use by the help and advice of private or public clinics. When modern contraceptive methods are ranked by popularity in Palestine in the year 2000, the IUDs have the highest rate of use (27.9%), followed by pills (5.7%). The least popular methods were sterilization and diaphragm/jelly/foam (0.2%, 0.3% respectively) <sup>[1]</sup>.

The OCP and IUD are the first contraceptive methods that most women in Palestine think of when considering birth control <sup>[1]</sup>. Today, the oral contraceptive pills are available as combined oral contraceptives (COC) which contain both estrogen and progestin hormones, or in progestin only pills (POP) which contain only progestin. These pills are considered safe for most women, however women who smoke and are over 35 or who have a significant family history of cardiovascular disease are not advised to use oral contraceptives due to an increased risk of cardiovascular diseases. Women with a medical history of blood clots, or breast or endometrial cancers also should not use combined oral contraceptives. Because the POP pills contain no estrogen, the risk of blood clots is not present as with the combined oral contraceptives. This type of birth

control pills is a good option for women who cannot take estrogen because they are breast feeding or because of headaches or high blood pressure problems associated with estrogen <sup>[2]</sup>.

With the injectable progestin, pregnancy can be prevented up to three months by injection of Depo-Provera®. This method is extremely effective since all that's required of a woman is to return to her health care provider for a shot every three months. Benefits and side effects of Depo-Provera® are similar to those of progestin only pills <sup>[3]</sup>.

Today, serious complications from the new generation of IUDs are rare, although IUD users may be at increased risk of developing pelvic inflammatory disease. Today's IUDs have one of the lowest failure rates of any contraceptive method. There are two types of IUD available, the Copper T and the Progesterone T. The IUD is an appropriate choice for those in long term monogamous relationships who are not at high risk for sexually transmitted diseases or infections <sup>[4]</sup>.

Vaginal spermicidal agents are available over the counter in the form of cream, jelly, foam, vaginal suppository or tablets. These products contain a sperm killing chemical. There is debate about the effectiveness of using vaginal spermicidal agents alone but it is thought that they have a high failure rate. Condoms, a barrier contraceptive method, are available as OTC and are a good choice for users who are at risk of developing sexually transmitted diseases <sup>[5]</sup>.

The Choice of contraceptive method depends on many factors, including effectiveness, age, convenience, risk factors, reliability, desire for future child bearing and finally cost of the contraceptive method <sup>[6]</sup>. Good information on cost and effectiveness of contraceptive options can aid physicians and payers in making decisions that result in optimum care for reproductive-aged women under a given set of financial constraints. Cost/effectiveness studies on contraceptive methods have been carried out in USA but none has been carried out in Palestine. One study have compared 15 contraceptive methods in terms of clinical and economical value and found that T-IUD and injectables were the most cost-effective followed by OCP <sup>[7]</sup>. Another study, compared eight methods of contraception and found that vasectomy and IUD are the most-cost-effective ones <sup>[8]</sup>. In all studies conducted to investigate the economics of contraception, they all concluded that any contraceptive method is less costly than unintended pregnancies <sup>[7- 8]</sup>. One regional study conducted in Iran found that IUD and implants were the most cost-effective contraceptive methods <sup>[9]</sup>.

The purpose of this study is to examine the cost-effectiveness of various female contraceptives currently available in Palestine for women desiring contraception from the perspective of the health providers and service payers.

### **Method**

The success rate (effectiveness) of the various contraceptive methods available in Palestine were determined by literature review. Unfortunately, up to our knowledge, there are no studies carried out in Palestine or neighboring countries to assess the rate of success of various contraceptive methods among women. So, the data for the success rate was based on the two National Surveys of Family Growth (NSFG) started in USA in 1982 and 1995 and the results were published in 1999 <sup>[10]</sup>. Costs of these methods were collected from community pharmacies and was based on the price list dated August 2002. The cost of each method was calculated per patient per day of use. The cost of IUD per day was calculated assuming a three-year device. The price of the device, insertion, removal and medical consultations were added up and divided by 1095 days (3\*365). The cost per day of the pill was calculated by adding the price of the drug to the medical consultation and divided by the number of tablets in the pack. For the annual costs of pills we assumed that no medical consultations were needed after the user has been stabilized on the pills. The cost per day of Depo-Provera® was calculated by dividing the total of the drug cost and medical services on 90 days. The annual costs of Depo-Provera® was calculated by multiplying the daily cost by 365 days. The cost/day of both the condoms and vaginal spermicidal agents was calculated based on the cost of a single condom or a single vaginal tablet. No reports in Palestine or Arab countries on the frequency of sexual intercourse among married couples is available. Average frequency of sexual intercourse varies from one country to another. Non-official web site shows that the range of intercourse varies from 64 to 130 per year in average <sup>[11]</sup>. So, for the annual costs of condoms and vaginal tablets, we assume that the frequency of sexual intercourse among married couples in Palestine is maximally 130 times per year. The prices of various contraceptive methods were extracted from the official price list distributed by the official drug agents in *West Bank* at the time of the study. The methodology we used is different from methodologies used in other C/E studies published in USA and Europe since most of them focused mainly on the economical consequences of success or failure (un-expected pregnancies) of the contraceptive methods. All calculations were made on USD using the official price list of the current currency exchange (1 USD = 5 NIS).

## Results

The most cost-effective therapeutic interventions under the current regulatory status were the IUD and the Depo-Provera® injections with a cost/effectiveness ratio (C/E) of 0.0007 and 0.0019 respectively. The least cost-effective methods were the COC and POP with a C/E ratio of 0.0062 and 0.0056 respectively. The condoms and the vaginal spermicidal agents fell in between in terms of cost-effectiveness analysis (see table # 1).

**Table 1:** Cost-Effectiveness ratio (E/C) of the tested contraceptive methods

Method	Effectiveness Rate	Direct Total Medical Costs (USD) per user per day of use.	Cost / Effectiveness Ratio
- (Copper) IUD (Anticon 300)®	94%	0.063 (Device + Medical Service)	0.0007
- Combined OCP (Microgenon)®	92%	0.52 (Drug + Medical Service)	0.0056
- Progestin Only OCP (Femulen)®	92%	0.57 (Drug + Medical Service)	0.0062
- Injectable Contraceptive (Depo-Provera®)	97.5%	0.19 (Drug + Medical Service)	0.0019
- Latex Condom (Durex)®	86%	0.23 (Device only)	0.0026
- Vag. Spermicidals (Glovan)®	74%	0.30 (Drug only)	0.0040

Table 1: Analysis of the Cost-Effectiveness of the contraceptive methods. The IUD method is the most cost-effective (C/E = 0.00067) and POP is the least cost-effective method (C/E = 0.0062).

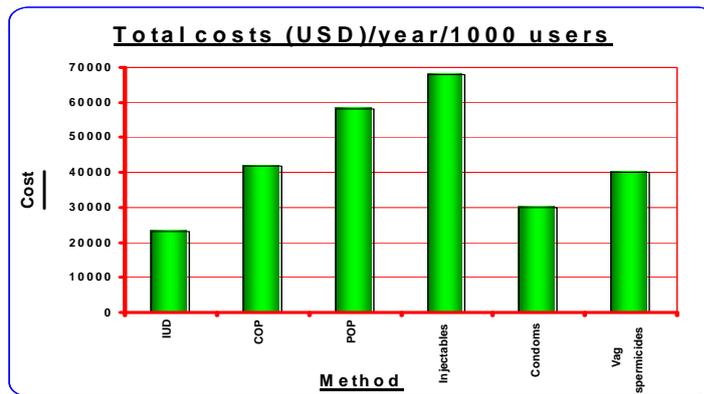
Analysis of the total annual costs for 1000 users showed that IUD method can make a saving of approximately 19,000 and 35,000 USD when compared to COC and POP respectively (see table 2 and Figure 1). The total annual costs per 1000 users of injectable Depo-Provera® is higher than that of either POP or COC (68,000 compared to 58,000 and 42,000 USD). Despite this significant difference in annual costs, Depo-Provera® is more cost-effective than either types of pills with a C/E of 0.002 compared with 0.0062 and 0.0056 for POP and COC respectively. This discrepancy is due to the better effectiveness or success rates of Depo-Provera® in preventing unintended pregnancies

compared to COC or POP. In contrast to Depo-Provera®, the condoms and the vaginal spermicidal agents have low annual costs per 1000 users (approximately 30,000 and 40,000 USD respectively). However, both of these methods have lower effectiveness rate than Depo-Provera® resulting in a lower cost-effectiveness ratio (see table 1).

**Table 2:** Total annual costs/1000 users of the various contraceptive methods.

Method		Direct Total Medical Costs (USD) per user per day.	Direct Total Medical Costs (USD) per user per year.	Costs per year per 1000 users (USD)
- (Copper) (Anticon 300)®	IUD	0.063	23.00	23,000
- Combined (Microgenon)®	OCP	0.52	41.92	41,920
- Progestin OCP (Femulen)®	Only	0.57	58.20	58,200
- Injectable Contraceptive (Depo-Provera®)		0.19	68.04	68,040
- Latex (Durex)®	Condom	0.23	29.90	29,900
- Vag. (Glovan)®	Spermicidal	0.30	39.9	39,900

Table 2: Analysis of the total annual costs per 1000 users. The IUD has the lowest annual costs followed by condoms. The Injectables and POP has the highest annual costs per 1000 users.



**Figure 1:** The total annual costs of the various tested contraceptive methods per 1000 users. The injectables have the highest costs and the IUD have the lowest annual costs per 1000 users.

## Discussion

The two health surveys made by the PCBS in 1996 and 2000 in Palestine had shown that there is an increase in the percentage of married women (16- 49 years of age) who use any contraceptive method (50.7% in 1996, 54.3% in 2000). This increase has been most among IUD and pill users. In 1996, 24.1% of married women use IUD, while 27.9% of married women use IUD in 2000 <sup>(1, 12)</sup>. This might be due to the introduction of newer, safer and more effective generation of IUDs compared with the old traditional ones. Another reason could be the increase in health awareness among Palestinian women regarding the contraceptive issues. The two surveys have also shown that the percentage of pill users have increased from 4.3% in 1996 to 5.7% in 2000. This increase in the use of contraceptive methods should be accompanied with parallel studies on the Palestinian community regarding contraceptive use and appropriate selection of the method.

As stated earlier, several factors should be considered when selecting a contraceptive method. The cost of contraception is one factor that affects the choice of a birth control method. An analysis of the first-year costs for the various methods, based on fees charged by private physicians and supplies purchased at drugstores, shows that the cost can be considerable and that there are large differences in cost between methods.

Our study shows that when the IUD is used for its full three-year lifespan, it is considered a perfect contraceptive choice considering both cost and

effectiveness in preventing unintended pregnancies. However, discontinuation of the IUD may make the IUD less cost-effective compared with other methods. The most recent surveys made in Palestine have indicated that the use of IUD is gaining popularity among married women <sup>[12]</sup>. The use of IUDs instead of oral pills (either COC or POP) could make a large annual savings (54,000 USD). This savings amount could be invested and directed toward other issues related to women's health like awareness and treatment of osteoporosis.

Our study also shows that Depo-Provera® is a good method considering both cost and effectiveness (C/E = 0.002). However, the total annual costs of Depo-Provera® is relatively high compared with other methods especially the oral pills. Actually, it is the most expensive method (see table 2 and figure 1). The percentage of women in Palestine using this method is very low (0.2%) indicating either a lack of awareness or inconvenience or fear of long term consequences on fertility <sup>[12]</sup>.

The condoms are considered an inexpensive method (30,000 USD per year per 1000 users) of contraception with relatively good C/E ratio. However, the use of condoms among Palestinian community does not exceed 4% among those who use any contraceptive method. This might be due to several reasons including the poor awareness of the condom method. This should encourage family planning clinics working in Palestine to increase awareness and to promote the use of condoms as a modern contraceptive method. Furthermore, the condoms have very little long term consequences on fertility compared with other methods and could help prevent the transmission of sexually transmitted diseases.

The oral pills surprisingly have low cost-effectiveness ratio especially the POP. Furthermore, the oral pills tend to have high annual costs compared to condoms and IUDs. This should encourage the family planning clinics not to consider pills as first or favorable choice of contraception. The current study may be limited by the fact that the model we used have focused on the direct costs of the method without focusing on indirect costs due to health risks or side effects of each contraceptive method tested. Finally, it is important to acknowledge that the results obtained might be different if other factors like social and medical consequences were taken into consideration.

### **Conclusions and Recommendations:**

The results of this study emphasizes the followings:

1. IUD and injectables are the most-cost effective while oral pills are the least cost – effective from the perspective of customer's in Palestine. The health care providers should take this into consideration when selecting a method for a customer.
2. Condom method is inexpensive and can save a lot of money when compared to pills. However, condom method is not common in the Palestinian community. Health providers should promote awareness about this method.

We strongly recommend that these conclusions to be taken into consideration by health policy makers since our findings were based on external statistical data to calculate the C/E ratio.

### References

- 1] Palestinian Central Bureau of Statistics, "Health Survey 2000, Main Findings", Ramallah, Palestine, (2001).
- 2] "Contraceptive options for the 1990s, Contraception: a review", **52(2)**, Kubba AA. Int J Clin Pract, Mar (1998), 102-5.
- 3] Schnare SM. J Midwifery, "Progestin contraceptives", *Women's Health*; **47(3)**, May-Jun (2002), 157-66.
- 4] Best Pract Res Clin Obstet Gynaecol, "Intrauterine devices", Bilian X, **16(2)**, Apr (2002), 155-68
- 5] Bergsjö P. Acta Obstet Gynecol Scand, "Condoms in the age of AIDS" **81(1)**, Jan (2002), 1-4.
- 6] , Gould D. Nurs Stand, "Contraception: the changing needs of women throughout the reproductive years", **14(38)**, Jun (2000) 7-13; 37-43; quiz 44-5.
- 7] Trussell J, Leveque JA, Koenig JD, London R, Borden S, Henneberry J, LaGuardia KD, Stewart F, Wilson TG, Wysocki S, et al, "The economic value of contraception: a comparison of 15 methods", *Am J Public Health*, **85(4)**, Apr (1995); 494-503.
- 8] Ashraf T, Arnold SB, Maxfield M Jr., "Cost-effectiveness of levonorgestrel subdermal implants, Comparison with other contraceptive methods available in the United States", *J Reprod Med*, **39(10)**, Oct., (1994), 791-8.
- 9] <http://www.royaninstitute.org/seminar01/SeAwAbs-26.htm>
- 10] Fu H, Darroch JE, Haas T, Ranjit N., "Contraceptive failure rates: new estimates from the 1995 National Survey of Family Growth", *Fam Plann Perspect*, **31(2)**, Mar-Apr (1999); 56-63
- 11] [www.durex.com](http://www.durex.com)
- 12] "Palestinian Central Bureau of Statistics, Health Survey 1996: Main Findings", Ramallah, Palestine, (1997).