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# Acceptability and use of emergency contraception among married women in Bangalore, India

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#### **Abstract**

**Objective**—To assess knowledge, acceptability, and use of emergency contraceptive pills (ECs) among lower-income married women in Bangalore, India.

**Methods**—EC counseling and supplies were offered to 322 women aged 18–25 years participating in a longitudinal reproductive health study. Participants completed interviews at enrollment and were followed for 1 year. EC acceptability and use were assessed, and factors associated with use were identified.

**Results**—206/320 (64.4%) participants did not desire pregnancy but only 46/321 (14.3%) used an intrauterine device or contraceptive pills. Only 25 (7.8%) had heard of ECs. Overall, 123 (38.2%) participants requested advance provisions of ECs after counseling. Over a year, 37/263 (14.1%) women used ECs, usually within 3 days of unprotected sex (33 [89.2%]), and 32 (86.5%) took both pills together or 1 day apart. Thirty-six (97.3%) felt glad and 31 (83.8%) were relieved after taking ECs. Twenty-five (67.6%) women who used ECs sought permission from their husbands. The only factor associated with EC use was couples' pregnancy intentions (odds ratio 4.71; 95% confidence interval, 1.43–15.58; *P* 0.01).

**Conclusion**—Indian women with access to ECs generally used them correctly and found them acceptable. Efforts to expand EC knowledge and access should be coupled with efforts to promote gender equality in the reproductive sphere.

#### Conflict of interest

The authors have no conflicts of interest.

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#### **Keywords**

Acceptability; Contraception; Emergency contraception; India; Unintended; pregnancy

#### 1. Introduction

Despite recent improvements in the prevalence of contraceptive use in India, unintended pregnancy remains a problem [1]. Unintended pregnancy and early and frequent childbearing contribute to high pregnancy and abortion-related morbidity/mortality [2–4] and hinder young women's ability to pursue educational or vocational opportunities.

As is the case in other South Asian countries, sex in India occurs largely within the context of early marriage, with the median age of women at marriage and first birth being 17 and 20 years, respectively [1]. Use of effective non-permanent contraception is low: only 5% use an intrauterine device or oral contraceptive pills [1]. Emergency contraceptive pills (ECs), made legal in India in 2003 and available over the counter from pharmacists since 2005 [5], are a safe female-controlled method of postcoital contraception [6]. Although interventions designed to increase access to ECs have not led to decreased pregnancy rates at the population level [7], ECs reduce a woman's risk of pregnancy by more than half [6]. In India, strong gender-based power imbalances can impinge upon women's agency in marital relationships [8, 9]. In circumstances in which women are unable to exercise sexual and reproductive decision-making [10, 11], ECs may provide an important backup option to enable women to control their fertility.

In spite of the legal availability of ECs in India, empirical data on their acceptability and use are scant. Data from the 2005–2006 Indian National Family Health Survey indicate that 11% and 20% of women and men, respectively, had heard of ECs [1]. The few small cross-sectional studies conducted across diverse sociodemographic subpopulations have documented low levels of knowledge (ranging from 0% to 14%) and negligible use of ECs [12–19], particularly among lower-income populations [14–16]. Only 1 study, conducted before the legal introduction of ECs, assessed their acceptability and use [20]. No participants in that study had heard of ECs; nearly all respondents given advance provisions used ECs correctly and reported that they would recommend them to a friend.

With ECs becoming increasingly available and publicized in India [21], data are needed on women's acceptability and use of the method. The aim of the present study was to assess the acceptability and use of levonorgestrel ECs among young married women who were offered counseling and advance provisions in a clinical research context. In addition, factors associated with EC use were examined. The study was unique in that it used a prospective cohort design and was conducted among low-income women, who in particular stand to benefit from improved access to contraception, including ECs.

#### 2. Materials and methods

The present investigation was conducted as a component of a longitudinal study examining gender-based power among women in low-income communities in Bangalore, India [9, 22]. Participants were recruited at 2 government health centers and through community outreach. Women eligible for the main study were 16–25 years of age, married, and fluent in the local language (Tamil or Kannada). Participants were followed for 2 years, completing follow-up visits at 12 and 24 months. The study, which was conducted from August 23, 2005, to January 29, 2008, was approved by the Institutional Review Boards of the University of

California, San Francisco, and RTI International; and the Institutional Ethics Committee of the Centre for Public Policy at the Indian Institute of Management, Bangalore.

The emergency contraception component of the study lasted for 1 year, from the 12-month visit to the 24-month visit. Participants who were unsterilized, not pregnant, and at least 18 years of age at the 12-month visit were included in the EC study cohort. Sociodemographics and EC knowledge and prior use were assessed within the main study interview. Participants were offered EC counseling and advance provisions after completing EC-specific informed consent procedures. Emergency contraceptive pills were not available at study centers outside of the study.

Trained female counselors, with similar demographic profiles to those of the participants, conducted 1-on-1 EC counseling using a detailed protocol including indications for use, correct use, and safety. Counselors received intensive training prior to and throughout the study, and counseling sessions were monitored for quality assurance. Participant comprehension was assessed after the counseling session. Counselors provided participants the option of obtaining up to 3 advance provisions of ECs (2 0.75-mg levonorgestrel pills [NorLevo; Cipla, Patalganga, Maharastra, India]); the decision to take provisions was voluntary. Participants were instructed to take the 2 pills together or 12 hours apart, within 72 hours of unprotected sex, if needed. Participants taking advance provisions met with a study clinician, who reinforced EC information. Participants who opted out of counseling or did not take provisions were advised to return to the clinic for ECs if needed.

At the 12-month interview, women were asked whether they had heard of either NorLevo or ECs ("pills that women can take once after sex to help prevent pregnancy"). Women who had heard of ECs were asked within how many days of unprotected sex a woman must take them, and whether ECs prevent pregnancy every time they are taken (correct or incorrect/do not know). These items were asked again at 24 months. Women who responded that they had not heard of ECs or NorLevo were shown a packet of ECs and asked if they recognized the pills. At the 24-month visit, participants answered questions on circumstances of EC use, and frequency, timing, and overall experience of use. Prior to the study, all study instruments were translated into Kannada and Tamil, then back-translated into English to ensure proper wording.

Participants were asked at 12 months whether they had ever used ECs. The main outcome—use of ECs over the 1-year study—was assessed by self-report at 24 months. Participants reported frequency of EC use over follow-up, whether they had been using another method of contraception, and with whom they spoke before using ECs the last time.

To assess correct use, participants who had used ECs were asked how long after unprotected sex they had ingested the pills: within 3 days was considered to be correct use. Participants were asked how many pills they took, whether they took them at the same time or separately, and how long after the first pill they took the second. Although the medication package at the time directed women to take the 2 pills 1 day apart, research had illustrated that the pills could also be taken together [23]; both of these regimens were considered to be correct.

Acceptability was measured by asking participants whether they felt glad, relieved, unwell, and/or worried after taking ECs. Women responded as to whether they would take ECs again if needed and whether they would recommend them to a friend. Experiences of common adverse effects after EC use were also assessed [23].

Data on sociodemographic characteristics, employment, recent experience of domestic violence, and contraceptive method use were collected. Couples' pregnancy intentions were

assessed via 2 questions about participants' and their husbands' desire for pregnancy in the following 6 months.

In analyses, knowledge and prior use of ECs at enrollment were described. Among women who completed EC counseling, the proportion requesting advance provisions and the number of doses requested were reported. Knowledge regarding ECs at the end of the study was examined using descriptive analyses among participants who had received EC counseling. It was not possible to assess improvement in knowledge because few women had heard of ECs at enrollment.

Unadjusted and adjusted logistic regression analyses were used to investigate factors associated with use of ECs over the study period. Factors that have been shown to be associated with reproductive health outcomes—including being in a love marriage (in which the woman and her husband decided themselves to get married), employment, and experience of violence—were examined [9, 22, 24]. Results are reported at the P < 0.05 level. Regression analyses were repeated among women who received EC counseling only and, separately, among women who did not desire pregnancy. For women reporting EC use, patterns and acceptability of use were described. Analyses were conducted using Stata SE version 12 (StataCorp, College Station, TX, USA).

#### 3. Results

Of the 653 participants in the underlying study who completed a 12-month visit (87.8% of enrolled cohort participants), 322 were eligible for the EC study. Reasons for ineligibility included being sterilized (n=229), pregnant (n=97), and younger than 18 years of age (n=5). The EC study participants were, on average, 23 years old. In total, 164 (50.9%) were Hindu, 115 (35.7%) were Christian, and 43 (13.4%) were Muslim (Table 1). Overall, 222 (68.9%) were in an arranged marriage and 276 (85.7%) had children. Most women did not desire pregnancy (206 [64.4%]) but only 46 (14.3%) were using an effective contraceptive method. Only 25/321 (7.8%) had heard of ECs at enrollment, and 1 woman knew ECs had to be taken within a 3-day timeframe. Two women had used ECs.

Overall, 228 (70.8%) EC study participants consented to EC counseling and 123 (38.2%) requested advance provisions. Among them, a single dose was given to 70 (56.9%); 2 doses were given to 23 (18.7%); and 3 doses were given to 29 (23.6%). Among the 94 (29.2%) participants who opted out of EC counseling, the most common reasons were concerns about disapproval of their husbands (59/92 [64.1%]) and lack of perception of pregnancy risk (58/92 [63.0%]), because the participant was either using contraception or not having sex frequently.

In total, 263 (81.7%) of the 322 participants completed 1-year follow-up interviews. Of the 190 participants who received EC counseling and completed follow-up, 139 (73.1%) could recall having heard of ECs a year later. This rose to 175 (92.1%) when women were shown an EC packet. A minority knew that ECs could be taken within 3 days (61/188 [32.5%]) or that they might not work every time they were taken (21 [11.1%]).

Overall, 37 women used ECs during the follow-up period (14.1% of women in the study and 33.0% of women who took advance provisions). In a multivariable model, EC use did not differ by sociodemographics, employment, recent violence, parity, or contraceptive method (Table 2). However, compared with couples in which both members desired pregnancy, women in marriages in which neither member wanted pregnancy were more likely to use ECs (odds ratio 4.71; 95% confidence interval, 1.43–15.58; *P* 0.01). None of the factors was significantly associated with EC use when the analysis was restricted to women who did not desire pregnancy or those who underwent EC counseling.

Of the women who used ECs during the 1-year study period, most used the method once (20 [54.1%]); 9 (24.3%) used it twice; 7 (18.9%) used it 3 times; and 1 woman used it 6 times (Table 3). All women obtained ECs through the study; 1 participant, who took ECs twice, obtained the second set of tablets from a medical store. Most EC users were not using a primary method of contraception when they last used ECs (31 [83.8%]).

Women who took ECs did so correctly and found the method acceptable (Table 3). Twenty-one (56.8%) women took ECs within a day of unprotected sex, and 33 (89.2%) within 3 days. Thirty-two (86.5%) took both pills either at the same time or 1 day apart. Four (10.8%) participants took only 1 pill. One participant took the 2 pills more than 4 days apart.

Most women spoke to their husbands prior to EC use (26 [70.3%]) or asked their husbands for permission (25 [67.6%]). The large majority felt glad (36 [97.3%]) or relieved (31 [83.8%]) that they had taken ECs, whereas 4 (10.8%) felt worried. Common adverse effects associated with EC use were reported, with fatigue the most commonly experienced (9 [24.3%]). Twenty-eight (75.7%) EC users reported that they would take ECs again if needed, and 30 (81.1%) would recommend ECs to a friend.

#### 4. Discussion

Information on and supplies of ECs were offered to married women living in slum neighborhoods in Bangalore, India. Overall, 14.1% of women used ECs over a year, and women generally used them correctly and found them to be acceptable. These results confirm those of the only other prospective study on ECs in India, which was conducted from 1997 to 2000 and showed that women with expanded access to ECs used the method more frequently than those without access [20]. Both that study and the present investigation used 2-dose EC regimens. Now that the EC products available in India contain a single tablet, correct use is likely to be facilitated.

Emergency contraceptive pills were used by women across ages, religions, education levels, and other characteristics. Women with recent experience of domestic violence, who may have been at increased risk of unintended pregnancy [24], were no more likely to use ECs than those who did not experience violence; similarly, women who did not want pregnancy while their husbands did were no more likely to use ECs than those in couples in which both spouses desired pregnancy. Increased use of ECs by these groups of women was expected owing to the potential for discreet usage. Research involving larger samples should examine whether the same gender-based power norms that contribute to domestic violence and women's lack of control over their fertility might also reduce their willingness to use ECs.

The present results highlight the dominant role of husbands' preferences in governing reproductive behaviors in India [11]. Concern regarding husbands' disapproval was a primary reason for women opting out of EC counseling. In addition, most women who used ECs spoke to or asked permission from their husbands prior to use. Efforts to improve access to ECs and other female-controlled contraceptive methods, particularly within marriage, may be thwarted unless underlying gender—power inequalities are also addressed, both by engaging with husbands and by enhancing women's relationship power.

Considering the extensive efforts made to counsel women on ECs, the low level of knowledge regarding ECs after 1 year was somewhat surprising. Messages about ECs (e.g. that the method may not work every time) can be complex. It may be challenging for women with minimal education and knowledge about their bodies to understand and retain information on the multiple features of ECs after a single counseling session. Future efforts to improve EC knowledge and access in similar resource-poor settings will require careful consideration of the content and delivery of messaging.

Although the present study was not designed to address the issue, research has documented that improved access to ECs does not compromise women's use of ongoing methods of contraception [7]. Only a small proportion of participants in the study, including those who used ECs, were using a primary contraceptive method. The dissemination of ECs provides an opportunity to emphasize their role as a backup method and to provide information on regular contraceptive methods that are more effective at preventing pregnancy.

Several limitations of the present data are important. Participants were recruited through clinics and outreach in surrounding neighborhoods [9]. Thus, the results may not be generalizable to all low-income married women in Bangalore. Data on EC use were obtained through self-reporting and there may have been social desirability biases. The small sample size limited the power to detect differences in use between groups of women. Furthermore, the provision of EC counseling to women in the study required considerable investment, training, and human resources, which may be challenging to duplicate or scale-up. Finally, knowledge regarding ECs has increased in India since the present data were collected. Although this trend has occurred primarily among the more educated and affluent [21], it is possible that the context of ECs has also changed for lower-income populations.

Over-the-counter availability of ECs presents an option for Indian women to control their fertility. The present study illustrated that, when made available in a clinical context, ECs were used, used correctly, and largely considered acceptable among young women. However, as in other low-resource country settings, multiple other barriers hinder EC use, including low levels of knowledge, high expense, and lack of accessibility [25]. There is a vital need to expand programs that promote gender equality in the reproductive sphere through emphasis on couple communication and joint decision-making.

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# **Synopsis**

When provided to young married women participating in a clinical research study in India, levonorgestrel emergency contraceptive pills were generally used correctly and considered to be acceptable.

Table 1

Participant characteristics (n=322) <sup>a,b</sup>

Characteristic	Value
Age, y	$22.9 \pm 2.3$
Duration of marriage, y	$4.4\pm2.6$
Education, y (n=321)	$6.1 \pm 3.6$
Language	
Kannada	97 (30.1)
Tamil	225 (69.9)
Religion	
Hindu	164 (50.9)
Christian	115 (35.7)
Muslim	43 (13.4)
Marriage type	
Arranged marriage <sup>C</sup>	222 (68.9)
Love marriage $d$	100 (31.1)
Parity	
0	46 (14.3)
1	129 (40.1)
2	104 (32.3)
3	43 (13.4)
Currently employed <sup>e</sup>	86 (26.7)
Experienced domestic violence in the past 6 months $^{\it f}$	88 (27.3)
Current contraceptive method	
None	232 (72.1)
Condoms	44 (13.7)
Intrauterine device or pills	46 (14.3)
Pregnancy intention (n=315)	
Both want	92 (29.2)
Only wife wants	21 (6.7)
Only husband wants	62 (19.7)
Neither want	140 (44.4)

 $<sup>{}^{</sup>a}$ Values are given as mean  $\pm$  SD or number (percentage).

 $<sup>^{</sup>b}$ Sample includes women from the underlying cohort study completing a 12-month follow-up visit who were not sterilized, pregnant, or minors.

<sup>&</sup>lt;sup>c</sup> A marriage arranged by the couple's family.

 $<sup>^{</sup>d}\!\mathrm{A}$  marriage in which the woman and her husband decided themselves to get married.

 $<sup>^{</sup>e}$ Currently working for money.

f Having been hit, kicked, or beaten for any reason by her husband.

 $\label{eq:Table 2} \textbf{Logistic regression analysis of factors predicting use of ECs (n=263)}$ 

Factor	Unadjusted odds ratio (95% confidence interval)	Adjusted odds ratio (95% confidence interval)
Age, y	0.90 (0.79–1.04)	a
Duration of marriage, y	1.05 (0.92–1.20)	a
Education, y	1.04 (0.93–1.15)	1.02 (0.91–1.14)
Language		
Kannada	Ref.	Ref.
Tamil	1.13 (0.54–2.39)	1.08 (0.47–2.50)
Religion		
Hindu	Ref.	Ref.
Muslim	1.87 (0.70–4.97)	1.07 (0.35–3.29)
Christian	1.11 (0.51–2.42)	1.01 (0.44–2.33)
Marriage type		
Arranged marriage	Ref.	Ref.
Love marriage	0.62 (0.28–1.37)	0.53 (0.22–1.28)
Parity		
0 or 1	Ref.	Ref.
2	1.61 (0.75–3.46)	1.02 (0.43–2.43)
3	1.60 (0.58–4.45)	1.21 (0.38–3.83)
Currently employed	0.49 (0.19–1.22)	0.61 (0.23–1.61)
Experienced domestic violence in the past 6 months	0.52 (0.22–1.23)	0.76 (0.30–1.96)
Current use of a contraceptive method	1.39 (0.67–2.90)	a
Pregnancy intention		
Both want	Ref.	Ref.
Only wife wants	2.50 (0.42–15.00)	2.56 (0.40–16.32)
Only husband wants	1.72 (0.44–6.71) <sup>b</sup>	1.85 (0.45–7.65)
Neither want	5.09 (1.69–15.31) <sup>C</sup>	4.71 (1.43–15.58) <sup>C</sup>

Abbreviation: EC, emergency contraceptive pill.

 $<sup>^{\</sup>it a}{\rm Omitted}$  from multivariable model owing to correlation with another variable in the model.

 $<sup>^</sup>b$ Significantly different from "neither want" at P<0.05.

 $<sup>^{</sup>c}_{P \ 0.01.}$ 

 $\label{eq:Table 3}$  EC use and acceptability among women reporting EC use at follow-up (n=37)

	No. (%)
Use	
Number of times ECs taken	
1	20 (54.1)
2	9 (24.3)
3	7 (18.9)
6	1 (2.7)
Used primary contraceptive method	6 (16.2)
Before use, spoke to <sup>a</sup>	
Husband	26 (70.3)
Husband (asked permission)	25 (67.6)
Friend	8 (21.6)
Mother	5 (13.5)
Mother-in-law or sister-in-law	4 (10.8)
Timing of use	
1 day	21 (56.8)
1–2 days	8 (21.6)
2–3 days	4 (10.8)
>3 days	4 (10.8)
Pills taken	
2 pills taken at the same time	27 (73.0)
2 pills taken 1 day apart	5 (13.5)
2 pills taken >1 day apart	1 (2.7)
1 pill only	4 (10.8)
Acceptability	
Feelings after EC use <sup>a</sup>	
Glad	36 (97.3)
Relieved	31 (83.8)
Sick or not well	6 (16.2)
Worried	4 (10.8)
Would take ECs again if needed	28 (75.7)
Would recommend to a friend in need	30 (81.1)
Adverse effects experienced <sup>a</sup>	
Fatigue	9 (24.3)
Nausea	7 (18.9)
Abdominal pain	6 (16.2)
Dizziness	5 (13.5)
Vomiting	4 (10.8)
Headache	3 (8.1)
Vaginal bleeding	1 (2.7)

Abbreviation: EC, emergency contraceptive pill.

 $<sup>{}^{</sup>a}$ Response categories not mutually exclusive.