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Title: Educational Intervention among adolescents and young adults on emergency contraception options

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Structured Abstract

Purpose: Emergency contraception, the ‘last chance’ contraceptive method, has gained significance post-Roe, but most young people do not know their options.

Methods: We conducted an educational intervention on emergency contraception (EC) among 1,053 students aged 18-25 years. We assessed changes in knowledge of key aspects of EC using generalized estimating equations.

Results: At baseline, virtually no one was aware of the IUD for EC (4%), but post-intervention, 89% correctly identified IUDs as the most effective EC (aOR= 116.6 CI 95% 62.4, 217.8). Knowledge that levonorgestrel pills could be accessed without a prescription grew (60% to 90%; aOR=9.7, 95% CI 6.7-14.0), as did knowledge that pills work best when taken as soon as possible (75% to 95%; aOR = 9.6, 95% CI 6.1-14.9). Multivariate results showed adolescent and young adult participants absorbed these key concepts across age, gender, and sexual orientation.

Conclusions: Timely interventions are needed to empower youth with knowledge of EC options.

Key words: Emergency contraception, emergency contraceptive pills, IUD for emergency contraception, adolescent and young adult contraceptive knowledge, ulipristal acetate, levonorgestrel emergency contraceptive pills

Implications and Contribution

This low-cost intervention equipped young people with increased awareness of their options for emergency contraception, which has taken on urgency in this time of greatly restricted reproductive autonomy in the U.S. Education on emergency contraception is especially important, given the short time window of use and increase in abortion bans.

Introduction

As a 'last chance' method, emergency contraception (EC) has taken on greater urgency in the post-*Roe* context, especially for adolescents and young adults with a strong desire to prevent pregnancy. Until now, awareness and availability of emergency contraception have lagged throughout the country. While levonorgestrel pills are more widely known¹ and available over-the-counter, the more effective EC prescription formulation, ulipristal acetate, and the intrauterine device (IUD) are rarely provided² and hardly known among patients.^{3,4}

Improving youth knowledge of EC options, however, may be easily attainable. Educational efforts can be impactful not only during clinic visits, but also in other community settings. We conducted a contraceptive intervention with youth-friendly visual tools in an educational setting, which showed an impact on general awareness of EC pills and regular contraceptive methods.⁵

This research note aims to explore the intervention effect on knowledge of how to access and use available EC options effectively, as the public health imperative for young people to know about these options, including the IUD as EC, has grown. Guided by the social determinants of health framework,⁶ we assessed the intervention's impact on youth knowledge about EC methods, accounting for a range of factors reflective of structural inequities in diverse student communities.⁷

Methods

We conducted a low-cost educational intervention among community college students aged 18-25 years, of all genders, using youth-friendly visual materials, to assess the impact on EC knowledge, including different aspects necessary to access and effectively use available options. Recruitment took place at five community colleges in the San Francisco Bay Area, California and Portland, Oregon. Research assistants set up tables on campus with study information, and interested students met in a private area to give informed consent and participate. Participants completed pre- and post-intervention surveys using iPads (see Yarger et al. 2022).⁵ The intervention was a 10-minute one-on-one session where research assistants, similar in age to the participants, showed a chart presenting the different EC methods, including levonorgestrel and ulipristal acetate pills and IUDs, with access information for each method, the time limit for use, effectiveness, and other factors. We developed the chart with [Bedsider](#) and piloted it among youths and health educators in an iterative process to integrate feedback, and then conducted in-depth interviews to inform the intervention.⁸ Participants received \$20 in remuneration. The study was approved by the Institutional Review Boards at the University of California, San Francisco and Oregon Health & Science University.

We measured changes in knowledge of emergency contraception and how to access it, including if participants were aware of IUDs for EC, whether EC pills work best if taken immediately after unprotected sexual intercourse,

which EC method is the most effective, and which method does not require a prescription.

To measure changes in knowledge, we used generalized estimating equations with logistic regression. We included covariates for race/ethnicity, immigrant, health insurance coverage, receipt of public assistance, sexual orientation, gender and age. We explored interactions of the intervention effect by age (adolescents 18-19 years vs. young adults 20-25), gender, and whether the participant was sexually experienced. Analyses were conducted in Stata version 16.1. Significance was reported at $p \leq 0.05$.

Results

The sample (N=1,053) was gender-inclusive, and diverse in terms of sexual orientation, race/ethnicity, and nativity (Table 1). Forty-three percent were adolescents aged 18-19 years. Among the 68% of participants who had had sexual intercourse, 47% used condoms, 22% pills, 11% withdrawal and 26% no method.

At baseline, participants had a vague awareness of EC, with 78% having heard of EC pills and 75% knowing where to obtain them, although many erroneously believed levonorgestrel pills (Plan B®) to be the most effective method (57%). Over half learned about the more effective pill, ulipristal acetate (ella®), for the first time from the intervention (56%). Participants identifying that pills worked best when taken as soon as possible after unprotected sex increased from 75% to 95% (aOR = 9.5 95% CI 6.1-14.9) (Figure 1, Table 2). Participants reporting that levonorgestrel pills could

be accessed without a prescription increased from 60% to 90% (aOR=9.7 95% CI 6.7,14.0). Awareness that IUDs could be used for EC grew from 4% to 65% (aOR=107.05, 95% CI 52.7-217.6).

Multivariate results showed sexually-experienced and female-identified participants and were more likely at the outset to know about EC pills (Model 1 & 2), but not IUDs (Models 3 & 4). Participants who were not yet sexually experienced, however, learned more from the intervention, evident by the interaction findings (Models 2 & 3). There were no differences in intervention impact by gender nor age, although adolescents learned more for the outcome, IUD is the most effective EC (not shown).

Discussion

Youth receiving this time-efficient educational intervention demonstrated significant increases in knowledge regarding different EC methods as well as critically important facts, like EC time-sensitivity, effectiveness, and need for a prescription. With many states passing abortion bans even for sexual assault,⁹ young people need to be aware of emergency contraceptives, as well as how to access and use them. National data showed that awareness and knowledge of effectiveness are essential for EC use.¹⁰ However, provider EC counseling for adolescents and young adults has remained surprisingly low over time, at around 5% from 2006 to 2017.¹¹ In fact, in 2020 only 18% of obstetrician gynecologists offered ulipristal acetate, the most effective pill form, and 29% IUDs for EC.¹ Improved insurance coverage for ulipristal acetate is still needed,¹² as is provider EC training

including on advance provision¹³ and emergency department provision,¹⁴ especially in restrictive states.¹⁵ At the same time, education for young people outside of clinic settings remains a critical complement, including learning about over-the-counter access or the IUD as EC. Given limited provider visit time for counseling, our intervention provides an opportunity to educate young people about all their EC options, especially needed for the IUD, as it is currently known to so few.³

A strength of our study was testing the intervention in a broad range of participants, including participants who were not yet sexually active, along with sexually active students, most of whom relied on condoms, withdrawal, or no method. Their increased awareness across EC method types showed it is possible to equip youth on many critical points. Young people from historically excluded communities will likely experience many impacts from restrictions following *Roe*, even in protective states.^{16,17} It is time to empower adolescents and young adults with knowledge about this last chance contraceptive.

Table 1. Sample Characteristics of Community College Students
Ages 18-25 years (N=1,053)^a

<i>Characteristic</i>	n (%)
Age	
18-19 years	453 (43)
20-25 years	600 (57)
Gender	
Female	608 (58)
Male	435 (41)
Transgender/Non-binary	10 (1)
Sexual Orientation	
Straight/heterosexual	908 (86)
LGBTQ+	145 (14)
Race/ethnicity	
Asian/Pacific Islander	290 (28)
Black	169 (16)
Hispanic	254 (24)
White	187 (18)
Other/Multiracial	153 (15)
Born outside the United States	281 (27)
Receives public assistance	195 (19)
Health insurance coverage	
None	69 (7)
Medicaid	357 (34)
Private	510 (48)
Do not know	117 (11)
Ever had sex	717 (68)
Current contraception ^b (<i>sub-sample of ever had sex=717</i>)	
Oral contraceptive pill	160 (22)
Transdermal patch/vaginal ring	15 (1)
Injectable	33 (5)
IUD	52 (7)
Subdermal implant	40 (6)
Condoms	338 (47)
Withdrawal	81 (8)
None	183 (26)

^aMissing data: n=7 in total (3 on race/ethnicity; 1 sexual orientation; 1 place of birth, public assistance, insurance; 2 outcome items.

^bParticipants could select more than one method; 25 (3%) reported EC use and, among those, 22 were also using another method (15 condoms, 10 pill, 9 withdrawal).

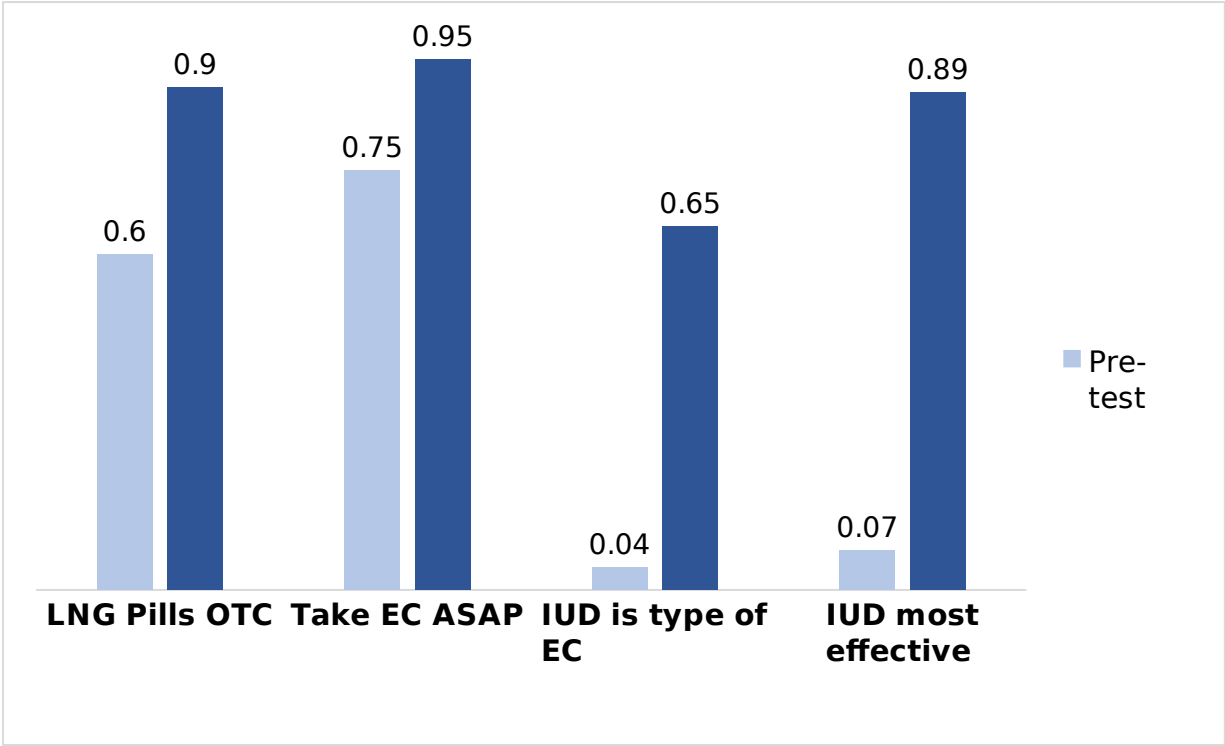
Table 2. Multivariate regression models predicting EC knowledge among community college students ages 18-25 in California and Oregon

	(1) Take EC ASAP		(2) LNG Pills OTC		(3) IUD is type of EC		(4) IUD most effecti ve	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
EC education intervention	9.55***	[6.11,14.9]	9.67***	[6.69,14.0]	107.1***	[52.7,217.6]	116.6***	[62.4,217.8]
Ever had sex	3.49***	[2.53,4.83]	2.86***	[2.13,3.84]	2.08	[0.96,4.52]	1.25	[0.73,2.14]
Intervention*ever sex	0.58	[0.32,1.06]	0.55*	[0.34,0.88]	0.32**	[0.15,0.70]	0.94	[0.46,1.92]
Age								
18-19 years	0.84	[0.63,1.13]	1.06	[0.83,1.35]	1.10	[0.85,1.42]	1.27	[0.95,1.71]
20-24 years	Ref		Ref		Ref		Ref	
Gender								
Female, Trans/other	2.87***	[2.13,3.87]	2.06***	[1.60,2.63]	0.92	[0.71,1.19]	1.32	[0.97,1.79]
Male	Ref		Ref		Ref		Ref	
Sexual orientation								
Straight	0.65	[0.39,1.10]	0.94	[0.64,1.38]	1.19	[0.83,1.72]	1.02	[0.71,1.45]
LGBTQ+	Ref		Ref		Ref		Ref	
Race/ethnicity								
White	Ref		Ref		Ref		Ref	
Black	0.99	[0.59,1.65]	0.91	[0.58,1.43]	0.53**	[0.34,0.84]	0.72	[0.44,1.17]
Hispanic	0.97	[0.59,1.60]	0.97	[0.64,1.47]	0.76	[0.51,1.13]	0.87	[0.58,1.31]
Asian/PI	0.65	[0.40,1.03]	0.62*	[0.42,0.92]	0.97	[0.65,1.46]	1.19	[0.78,1.80]
Other/Multi-racial	1.28	[0.76,2.16]	1.05	[0.68,1.62]	0.79	[0.51,1.22]	1.05	[0.66,1.69]

Immigrant to US	1.02	[0.74,1.41]	0.62***	[0.47,0.81]	1.32	[0.98,1.78]	1.04	[0.73,1.49]
Health insurance								
None	1.32	[0.67,2.61]	0.82	[0.49,1.36]	0.66	[0.38,1.13]	0.73	[0.35,1.52]
Medicaid	0.66*	[0.46,0.94]	0.76	[0.57,1.01]	0.98	[0.72,1.31]	0.88	[0.61,1.25]
Private	Ref		Ref		Ref		Ref	
Don't know	0.73	[0.47,1.14]	0.67*	[0.46,0.98]	0.81	[0.53,1.22]	0.73	[0.48,1.10]
Receives public assistance	1.22	[0.82,1.81]	1.17	[0.83,1.64]	0.73	[0.53,1.02]	1.28	[0.87,1.89]
No. Observations	n=1,053		n=1,053		n=1,053		n=1,053	

















aOR = adjusted odds ratios; CI= confidence intervals; Ref= reference; Models control for site; Female includes 10 participants assigned female at birth identifying as transgender, nonbinary, agender, genderfluid; when modeled separately, results did not differ. *p ≤0.05 **p ≤0.01 ***p ≤0.001

Figure 1. Increased knowledge of emergency contraception from educational intervention



Adjusted odds ratios of intervention impact from multivariate generalized estimating equations including measures of age, gender, sexual orientation, ever had sex, race/ethnicity, immigrant, health insurance, public assistance.

OOPS! EMERGENCY CONTRACEPTION: BIRTH CONTROL THAT WORKS AFTER SEX

Types of emergency contraception	How well does it work?	How soon do I have to use it?	How do I use it?	Where can I get it?
 ParaGard IUD	 Almost 100% effective	 Within 5 days	 It's placed in the uterus by a doctor or nurse	 From a doctor, nurse, or at a clinic
  ella	 Less effective if over 195 pounds. Try an IUD.	 ASAP Works better the sooner you take it, up to 5 days.	 Take the pill as soon as you get it	 From a doctor, nurse, or at a clinic
 Plan B One-Step or a generic	 Less effective if over 165 pounds. Try ella or an IUD.	 ASAP Works better the sooner you take it, up to 3 days.	 Take the pill as soon as you get it	 At a pharmacy, no prescription needed



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