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## Developing Emergency Department–based Education About Emergency Contraception: Adolescent Preferences

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### Abstract

**Objectives**—The objective was to identify adolescent preferences for emergency department (ED)-based education about emergency contraception.

**Methods**—This was a cross-sectional computerized survey, using adaptive conjoint analysis (ACA). Patients were eligible if they were females ages 14 through 19 years old and were seeking care in one of two urban EDs. Patients were excluded if they were too ill to participate in the survey or if they were non-English speaking. Participants completed a computerized survey that used ACA, a technique that can be used to assess patients’ relative preferences for services. ACA uses the individual’s answers to update and refine questions through trade-off comparisons, so that each respondent answers a customized set of questions. The survey assessed preferences for the following attributes of emergency contraception education: who should deliver the education, if anyone (e.g., nurse, doctor); how the education should be delivered (e.g., by a person or via video); how often the education should be offered if patients were to frequent the ED (e.g., every time or only when asking for it); length (e.g., 5 minutes, 10 minutes); and chief complaint that would trigger the education (e.g., headache or stomach pain).

**Results**—A total of 223 patients were enrolled (37.2% at Hospital 1 and 62.8% at Hospital 2). The mean ( $\pm$ SD) age of the participants was 16.1 ( $\pm$ 1.3) years. Just over half (55%) reported a history of sexual activity; 8% reported a history of pregnancy. Overall, the participants preferred education that was delivered by a person, specifically a doctor or nurse. They preferred a slightly longer education session and preferred education directed at patients seeking care in the ED for complaints potentially related to sexual activity.

**Conclusions**—Adolescents have specific preferences for how education about emergency contraception would best serve their needs. This information can inform clinicians as they work to improve adolescents' knowledge about pregnancy prevention and emergency contraception in particular.

Although the teenage birth rate has declined over the past several years, the United States has by far the highest teenage pregnancy rate of any industrialized nation,<sup>1</sup> and unintended pregnancy remains a major public health issue. Just over 730,000 pregnancies to young women ages 15 to 19 years were reported in 2008,<sup>2</sup> and just over 329,000 births to young women ages 15 through 19 years were reported in 2011.<sup>3</sup> Additionally, an estimated 80% of teenage pregnancies are unintended,<sup>4</sup> and although the decline in pregnancy rates is partially attributed to improved use of contraception over the past decade, a significant proportion of teenagers report using no contraception during their first sexual intercourse.<sup>5</sup> Concern about adolescent pregnancy was highlighted in the U.S. Department of Health and Human Services' Healthy People goals for 2010 and recently again for 2020,<sup>6</sup> because of its association with poor health outcomes as well as the heavy social and economic burden on parents and society.<sup>7–12</sup>

The emergency department (ED) is an opportune site to reach adolescents at risk for pregnancy. Adolescents use the ED more frequently than adults;<sup>13</sup> in addition, adolescents with higher levels of risk behaviors, such as substance use and depression, are more likely to use the ED as their primary source of care.<sup>14</sup> A significant proportion of teenagers may be at risk of pregnancy at the time of their ED visits; a study conducted at two urban EDs found that between 10 and 47% of sexually active 15- to 18-year-olds reported that they used no form of contraception and were not trying to become pregnant.<sup>15</sup> A more recent study found that 14% of sexually active adolescents reported unprotected vaginal intercourse within the 5 days preceding the ED visit,<sup>16</sup> which is especially significant given the narrow time frame for effective use of emergency contraception. Emergency contraception, as used in this study, refers to the use of hormonal medications within 120 hours after unprotected sexual intercourse to prevent pregnancy. A dedicated emergency contraception product containing levonorgestrel (Plan B, Teva Pharmaceuticals, Petah Tikva, Israel) has been available as a prescription product in the United States for many years and more recently as a behind-the-counter medication for women ages 17 years and older. After a long legal battle, some forms of emergency contraception will now be available to all ages without a prescription,<sup>17</sup> although at the time of this study, adolescents younger than 17 years old required a prescription to obtain emergency contraception. We chose to focus on a population of adolescents seeking care in the ED to assess preferences for education about emergency contraception.

This study builds on our previous work,<sup>18</sup> in which we used in-depth interviews to probe urban adolescents' attitudes about using the ED as site for education to improve access to emergency contraception. While participants in that study were generally supportive, we found no clear preferences for specific components for an educational session. Therefore, we used the technique of conjoint analysis to better assess preferences among different options for delivering EC information. Conjoint analysis is a reliable, valid technique<sup>19,20</sup> that originated in marketing but has recently been used in health care.<sup>21–24</sup> Conjoint analysis

derives preferences by asking respondents to choose between competing combinations of components (or attributes) of products or services. One method for collecting data for conjoint analysis is adaptive conjoint analysis (ACA), which involves several steps. First, the investigators determine the relevant product/intervention/session attributes and the levels of attributes (i.e., specific options within each attribute) between which the participants will choose. Next, the participants rank the attributes using an interactive computer program. ACA first asks participants to rank attributes and then develops the trade-off tasks based on the attributes most highly ranked by the patient. Therefore, each respondent answers a customized set of questions. This technique has excellent internal consistency and has the potential for developing more patient-centered approaches.<sup>19–21,25,26</sup> Finally, the software can be used to analyze the results, providing utilities for each of the attribute levels.

The objective of this study was to identify patient preferences for ED-based education about emergency contraception. We hypothesized that adolescents would prefer a technology-based, very brief education session that would be available to all adolescent patients presenting to the ED.

## METHODS

### Study Design, Setting, and Population

We conducted a cross-sectional survey with female adolescents seeking care in one of two urban, children's hospital EDs. The general methods of this study (setting, population, inclusion criteria) have been described elsewhere.<sup>27</sup> Briefly, participants were included at Hospital 1 if they were females between the ages of 15 and 19 years (inclusive), if they resided in one of 11 zip codes surrounding the hospital, and if they were African-American and English speaking. At Hospital 2, participants as young as 14 years old were included, and there were no geographic or racial/ethnic limitations for inclusion. Participants were excluded at both institutions if they were identified by the patient care team as too acutely ill to participate or if they had significant developmental delay that would make completing the questionnaire difficult. Both institutions have a small proportion of adolescent patients who are not English-speaking. The study protocol and consent procedures were approved by the institutional review boards at both institutions.

### Survey Content and Administration

As described previously,<sup>27</sup> trained research assistants (RAs) identified potentially eligible patients in the ED through the computerized ED tracking boards. We requested and were granted a waiver of parental consent as the study involved only participation in a confidential survey that did not alter the course of the patients' care, and a waiver of written consent, as an informed consent document would be the only link between the participant and the study data. Potential participants were told involvement in the study would take up to 30 minutes.

As published previously, each participant first completed a detailed assessment of knowledge, attitudes, and beliefs about emergency contraception.<sup>27</sup> This was to ensure that each participant had some information about emergency contraception and had an

opportunity to begin to reflect on emergency contraception before moving on to questions about preference. The RA then completed a computerized survey using Sawtooth Software (Sequim, WA) with each participant. During survey administration, only the participant and the RA were in the patient's ED room. The survey was pilot tested on 10 participants prior to beginning study enrollment to ensure readability and comprehension. Demographic data (including age, race, visits to a gynecologist, and sexual history) were collected prior to the computerized portion of the survey. The conjoint tasks were then completed on a portable laptop computer. The selection of attributes for this conjoint portion of the survey was based on our prior qualitative work,<sup>18</sup> where we identified important aspects of education around emergency contraception with a similar population of ED patients. Additionally, the responses to the open-ended questions in our prior work informed the attribute and level response options for this study.<sup>18</sup> Specifically, patients told us that they care about who or what delivers education, who should be offered education, and how long an educational session should take. The survey assessed preferences within the following attributes: who should deliver the education, if anyone; potential materials to supplement or replace face-to-face conversations, such as pamphlets or a video; frequency with which education should be offered (if patients were to return to the ED in the future); length of an educational session; and ED visit circumstances for offering education (chief complaint). Each attribute had between three and five levels; the attributes and levels are listed in Table 1.

First, the participant ranked each attribute independently on a seven-point Likert-type scale ranging from "not desirable" to "extremely desirable." For example, participants were asked, "If you were going to learn about the morning after pill from someone while you are in the ED, how important would it be for you to learn from each of these people?" Second, the participant was asked to choose between two levels of the same attribute; the ACA software chose each pair based on the participant's own responses to the initial questions. For example, if a participant ranked talking to a doctor and a nurse as very desirable, she might then be asked to compare these two options with the following question: "Imagine that you are going to learn about the morning after pill in the ED. How important is this difference to you? Learn from a doctor OR learn from a nurse," with options on a seven-point Likert scale ranging from not important to extremely important. Third, the participant was asked to indicate her preference between education deliveries that included two different levels for two different attributes ("Next you will be presented with two different ways of learning about the morning after pill combining some of the things we've already talked about. Choose which combination you prefer and how strongly you prefer it over the other combinations.") An example of this step would be as follows: learn by talking to someone/offered one time versus learn from a video/offered when I ask for it. Finally, this exercise was repeated for combinations of three attributes. Each combination was individually selected by the computer software based on the participant's earlier responses.

The design of the conjoint survey is determined by the ACA software, which ensures that choices are displayed at random on the right or left side of the screen. The minimum number of recommended pairs is determined by a built-in formula; we included a maximum of five pairwise comparisons. ACA software further constructs the pairs by examining all of the possible ways the levels can be combined and ensures that the options presented are balanced and that the design matrix is orthogonal. Information about how ACA determines

each subsequent pairwise comparison can be found in the Sawtooth Technical paper series.<sup>28</sup>

### Data Analysis

Demographic characteristics were summarized by standard descriptive statistics (e.g., means and standard deviations [SDs]) for continuous variables such as age and percentages for categorical variables such as type of primary care provider). Data were analyzed using the ACA software, which uses least-squares regression to calculate a beta coefficient for each individual's relative preference for each level of each attribute, which are then averaged by the program to provide utilities ("scores") across the entire study sample. Additionally, the ACA software provides average importance scores by dividing the range of each attribute by the sum of ranges of all attributes and multiplying by 100. The relative importance scores are thus proportions and sum to 100. These importance scores reflect the extent to which a particular attribute affects the participants' overall opinion about the educational session, relative to the other attributes. We assigned a value of zero for the least preferred level of each attribute for ease of interpretation. Therefore, we report relative differences between the utilities and not their absolute value. The higher the number, the more preferred the level.

## RESULTS

Participant enrollment began at Hospital 1 in June 2008 and was completed in April 2009; enrollment at Hospital 2 began in June 2009 and was completed in November 2009. The survey was not changed after the pilot phase, as it was found to be easily understandable by the participants. A total of 403 adolescents were approached for enrollment; 223 (55.5%) consented for enrollment: 83 (37.2% of the total) at Hospital 1 and 140 (62.8% of the total) at Hospital 2. Refusal rates were slightly higher at Hospital 1 (50% at Hospital 1, 40% at Hospital 2). Demographic data (race/ethnicity and age) were collected for 90% of those who refused; those who refused were similar in these categories to those who consented. Most of those who refused reported "I don't have time" or "I don't feel like it" as the reason for refusal; for 22%, the parent refused participation on behalf of the patient. Of those who completed the study, none requested assistance from the RA during survey administration.

Demographic data of the study population, overall and by site of enrollment, have been previously published<sup>27</sup> and are presented in Table 2. Of note, many (20.2%) reported that they would be at risk for pregnancy in the next 6 months, mostly (77.8% of those at risk) due to actual or likely inconsistent contraception use, including 4.5% of the total sample who intended to *become* sexually active.

### Relative Preferences

As noted under Methods, the least preferred level was assigned a utility of zero. The utilities are presented in Table 3. The participants much preferred talking to someone about emergency contraception compared to learning from a video or computer (average utilities of 53.2, 15.3, and 12.3, respectively). They also preferred speaking to a nurse or doctor over a peer counselor (average utilities of 88.9, 65.2, and 26.9, respectively). Furthermore, they

preferred education directed at patients with complaints potentially related to sexual activity (such as specific concern for pregnancy or a sexually transmitted infection) rather than for an injury (average utilities of 83.9, 63.6, and 0) and slightly longer education (20 minutes vs. 10 or 5 minutes; average utilities of 11.9, 10.9, and 0).

### Importance Scores

Overall, participants placed the most importance on learning from a particular type of person (mean  $\pm$  SD importance = 25.1  $\pm$  9.2) and type of ED complaint triggering the education (mean  $\pm$  SD importance = 24.6  $\pm$  7.8). Less important for education delivery were the specific modality (i.e., video, pamphlet, person; mean  $\pm$  SD importance = 19.3  $\pm$  7.8), frequency of education offering (mean  $\pm$  SD importance = 16.9  $\pm$  7.9), and duration of educational session (mean  $\pm$  SD importance = 14.0  $\pm$  7.5).

## DISCUSSION

Unintended teenage pregnancy remains a major public health issue in the United States. Given the complexity surrounding the issues of sexual activity and pregnancy prevention among adolescents, efforts to reduce teen pregnancy must be multifaceted. One avenue to aid in the reduction of unintended pregnancy is to increase the use of contraceptives, with particular attention to emergency contraception, given the lack of knowledge about and underutilization of this method.<sup>27,29–34</sup> The recent decision by the U.S. government to end the appeals process and work to comply with Judge Edward Korman's order that emergency contraception be available to all ages without a prescription will likely greatly increase access to emergency contraception,<sup>17</sup> but not necessarily awareness or specific knowledge of the method; therefore, it remains important to explore opportunities to increase awareness and education about emergency contraception for this vulnerable population. Additionally, recent data have found that knowledge about emergency contraception, even among pharmacists, is less than ideal, and pharmacy access to emergency contraception is not universal, so that providing education about emergency contraception to patients so they are empowered to use it appropriately is imperative.<sup>35–38</sup>

In addition to awareness and accessibility issues, prior studies have demonstrated confidential care for adolescents may be limited in primary care practices and that many adolescents forego seeking health care even when they perceive a need for care.<sup>39–41</sup> Those who forego care are more likely to be sexually active and to use cigarettes, alcohol, and drugs, among other risk factors.<sup>40,42</sup> Therefore, identifying sites for education with adolescents beyond the primary care provider will likely reach otherwise difficult-to-reach teenagers; specifically, the ED has been identified as a potential location for preventive care,<sup>43</sup> including pregnancy prevention education.<sup>15</sup> We used the method of ACA, a well-established tool in marketing that is novel in our setting as well as with adolescents and around sexual health issues. Our results indicate that adolescents have specific ideas about how education about emergency contraception would best serve their needs. Our earlier work identified specific attributes that adolescents perceive to be important for delivery, but this study helps us to understand adolescents' preferences for those attributes. We now have a clearer understanding of what to consider from the adolescents' perspectives when

designing ED-based education around emergency contraception. In addition, by expanding our inclusion criteria for this study as compared to our earlier work, we were able to improve the generalizability of these findings. Our results did not support our initial hypothesis, in that adolescents in our study indicated that they were most interested in slightly longer education that was delivered by a nurse or a doctor and offered only to a specific subset of patients, rather than brief, technology-based education offered to all adolescents. Although it is possible that the participants interpreted the questions up front as part of an in-depth “intervention” and so answered accordingly, we believe that the open-ended nature of the questions (i.e., ways to “learn about the morning after pill”) allowed for a variety of potential responses.

Of note, our results indicating that adolescents prefer to speak to a person rather than watch a video contrast with recently published work around the effectiveness of an HIV educational video in improving adolescents’ knowledge around HIV and in increasing their willingness to be tested for HIV.<sup>44</sup> This may be due to the fact that Calderon and colleagues<sup>44</sup> assessed outcome (increased knowledge and increased HIV testing) rather than preferences. Perhaps adolescents seeking pregnancy prevention education may feel that speaking to a person will allow a more tailored approach than watching a video. While Delgado and colleagues<sup>45</sup> found that patients surveyed in three urban, general EDs preferred learning from books or videos over learning from experts, those who did prefer speaking with experts were those without high school education and those seeking information around subjects similar to emergency contraception, such as HIV testing.<sup>45</sup> Additionally, although our results reflect the patient’s perspective, many other factors will affect the delivery of education in the ED, including personnel issues and costs, and any intervention should be tested for efficacy. One possible educational approach could be to train nurses to provide patient-directed education during times the nurse would routinely be interacting with the patient, so as not to disrupt flow in the ED. A flexible, fluid approach is likely to be most successful, considering the many factors that will influence success, and it is possible that not all of the preferences reflected in this study will be able to be included by all practitioners in all settings. Further work designing and pilot testing ED-based education can address this gap.

## LIMITATIONS

First, there is no clear consensus on calculating a power analysis for ACA studies.<sup>46</sup> However, there are general rules of thumb that suggest that a sample size of 200+ is adequate for an exploratory study intended to assess main effects of group-level preferences.<sup>46</sup> Second, the sample recruited from one of the sites was a fairly homogeneous group. To increase the diversity of the sample, and thereby increase the generalizability of the results, we chose to conduct the study assessments at a second site. Because our goal was to increase generalizability, we did not analyze the two sites separately with respect to ACA; examining interindividual differences in preferences was beyond the scope of this study and could represent an area for further investigation. However, the two groups were similar in the percentages who reported histories of sexual activity. Also, we have previously published an analysis of the data related to attitudes and beliefs about emergency contraception, which did examine the two sites separately and found no differences in

attitudes, perceived behavioral control, subjective norms, or intention to use emergency contraception between the two study sites.<sup>27</sup> Next, approximately 50% of patients who were eligible for the study declined participation, so our results may be affected in that those who chose to participate may have had more knowledge or stronger opinions about emergency contraception. However, those who declined were similar in age and race/ethnicity to those who participated, and we enrolled a group of patients of varying ages, chief complaints, and ethnicities. Additionally, the ACA computerized survey can be challenging for participants to understand. We sought to limit this issue by pilot testing the questions and the survey prior to beginning enrollment and by having an RA available to assist the participants with the survey; we found that our participants were able to complete the survey with little or no outside assistance. Finally, we did not specify the sex of potential providers of education in the questions, which may have affected how participants answered particular questions. In our prior work, however, the sex of the person delivering education has not been mentioned as a potential issue.

## CONCLUSIONS

The geographically diverse groups of adolescents in this study have specific ideas about how education around emergency contraception would best serve their needs, with a particular interest in in-person, targeted counseling. Recognizing that many additional factors influence the delivery of education in the ED setting, ED providers can work to improve education about emergency contraception, keeping these preferences in mind as they seek to maximize effect of education in the ED.

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**Table 1**

## Definitions of Attributes and Levels Provided to Participants

Attribute	Level(s)	Definition
Learn from someone	Nurse	An ED nurse
	Doctor	A physician in the ED
	Peer counselor	A counselor of similar age to patient
	Older counselor	An adult counselor
	No one	Prefer not to speak to a person
How to learn	Video	Watch a short video with information
	Pamphlet	Be handed a pamphlet with information
	Something on the computer	A Web-based module on EC
	Talk to someone	Prefer to speak to someone rather than independent learning. NOT A CHOICE IF CHOSE "NO ONE" FOR ABOVE
Frequency education offered	Every time in the ED	To all patients every visit
	Once	Once receive education would not be offered again
	Only when ask for it	Education would be advertised (signs, etc.) and offered if requested
Duration of session	5 minutes	Education takes 5 minutes
	10 minutes	Education takes 10 minutes
	20 minutes	Education takes 20 minutes
Type of ED complaint triggering education	Headache	You came to the ED because of a headache
	Stomachache	You came to the ED because your stomach hurt
	Hurt/injured	You came to the ED because you were hurt or injured
	I think I could have an STI	You came to the ED because you were worried you might have an STI, and you tell a provider that
	I think I could be pregnant	You came to the ED because you were worried you might be pregnant, and you tell a provider that

Note: The program had a prohibition for asking about the first two attributes together during the combination questions.

EC = Emergency Contraception; STI = sexually transmitted infection.

**Table 2**Characteristics of the Study Population ( $N = 223$ )

Characteristic	Overall, $N = 223$	Hospital 1, $n = 83$ (37.2)	Hospital 2, $n = 140$ (62.8)
Mean age, yr ( $\pm$ SD)*	16.1 ( $\pm$ 1.3)	16.7 ( $\pm$ 1.1)	15.8 ( $\pm$ 1.3)
Race/ethnicity*			
African-American	155 (69.5)	83 (100)	72 (51.4)
White	45 (20.2)	0	45 (32.1)
Hispanic	12 (5.4)	0	12 (8.6)
Mixed race	10 (4.5)	0	10 (7.1)
Asian	1 (0.04)	0	1 (0.1)
In care of a gynecologist	49 (22.0)	24 (28.9)	25 (17.9)
History of sexual activity	124 (55.6)	53 (63.9)	71 (50.7)
History of pregnancy*	18 (8.0)	14 (16.9)	4 (2.9)
Triage acuity*			
Critical	0	0	0
Acute	25 (11.2)	19 (22.9)	6 (4.3)
Urgent	148 (66.4)	34 (41.0)	114 (81.4)
Nonurgent	47 (21.1)	28 (33.7)	19 (13.6)
Missing	3 (1.3)	2	1

Data are reported as  $n$  (%) unless otherwise noted.\*  $p < 0.05$ .

**Table 3**

## Relative Utilities for Each Attribute

Attribute	Level	Relative Utility
Learn from someone	Nurse	88.9
	Doctor	65.2
	Peer counselor	36.9
	Older counselor	51.5
	No one	0
How to learn	Video	15.3
	Pamphlet	0
	Something on the computer	12.3
	Talk to someone	53.2
Frequency education offered	Every time in the ED	13.8
	Once	0
	Only when ask for it	20.3
Duration of session	5 minutes	0
	10 minutes	10.9
	20 minutes	11.9
Type of ED complaint triggering education	Headache	2.3
	Stomachache	42.0
	Hurt/injured	0
	I think I could have an STI	63.6
	I think I could be pregnant	83.9

The least preferred level of each attribute was assigned a value of 0.

STI = sexually transmitted infection.