

UNIVERSITY OF HAWAII LIBRARY

**PREDICTORS OF UNIVERSITY WOMEN REQUESTING EMERGENCY  
CONTRACEPTION AT COLLEGE HEALTH SERVICES**

**A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY  
OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF**

**MASTER OF SCIENCE**

**IN**

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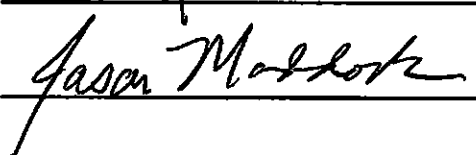
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**We certify that we have read this thesis and that, in our opinion, it is satisfactory in scope and quality as a thesis for the degree of Master of Science in Public Health.**

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## DEDICATION

**This thesis project is dedicated to my most precious and supportive wife who encouraged me with all of her heart and soul. I will forever appreciate her selfless act of foregoing personal dreams and pursuits as I completed my schooling. Her personal act of selflessness continues to inspire me and drives me to excel in all that I do. The time and effort invested in this work is but a fraction of the time and effort she spent in supporting and encouraging me. She will always be my friend, my strength, and most of all my love and eternal companion.**

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## ABSTRACT

The objective of this study was to identify risk factors associated with requesting emergency contraception (EC). A total of 309 eligible participants responded to a survey at University of Hawaii Women's Health Clinic. Logistic regression was used to identify indicators for requesting EC. Women requesting EC were at 2.27 greater odds of reporting perceived risk for pregnancy because of unprotected sex, opposed to "backing up a failed or questionable method". They were also significantly more likely to have previously used EC one ( $p < 0.001$ ) or two or more ( $p < 0.001$ ) times within the last year; and were more likely to have consumed 4 or more alcoholic drinks at last intercourse. These findings suggest that efforts to reduce negative sexual consequences within this population should include a comprehensive sexual responsibility program. This would encourage the adoption of and consistent use of a primary contraceptive method and reinforce EC as a secondary intervention.

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## **Chapter I. Background**

### **Statement of the Problem**

Understanding specific risks among the university/young adult population has been the focus of a great deal of investigation, with a considerable emphasis on sexual risks<sup>1-9</sup>. This unique population is persistently researched because it continues to be at a particularly high risk for sexually transmitted diseases (STD's) and unintended pregnancies<sup>10,11</sup>.

Of the approximately 19 million new cases of STD's, 48% (~9million) cases were among persons aged 15-24 years<sup>11</sup>. This age group maintains a large burden of the STD prevalence as well as a large proportion of the unintended pregnancies and births within the United States. It has been estimated that despite large efforts to increase the use of contraception approximately 870,000 pregnancies occur each year among 15-19 year olds<sup>12</sup>. Nationwide, approximately 50% of all pregnancies are unintended, and among adolescents anywhere from 80 to 90% are unintended<sup>13-15</sup>. More than 8 out of every 100 teens aged 15 to 19 will become pregnant each year, resulting in over half becoming mothers<sup>16-18</sup>. Specifically among the college population, it is estimated that 80 to 90% of all students are sexually experienced, many of whom are practicing unsafe sexual activities<sup>12,19-21</sup>.

Currently an increasing effort is being made to combat the high rate of unintended pregnancies and abortions locally as well as globally, through the widespread use of Emergency Contraception (EC)<sup>22-24</sup>, which has been estimated as having the potential to reduce approximately 1.7 million unintended pregnancies and 800,000 abortions each

year<sup>25,26</sup>. While EC holds much promise, many questions remain about its ability to actually reduce these projected rates.

### About Emergency Contraception

Hormonal emergency contraception was developed and first promoted by a Canadian professor A. Alblet Yuzpe in the mid 1970's<sup>27</sup>. The Yuzpe regimen, Levanorgestrel (plan B), and IUD insertion are all different types of emergency contraception, which have varying effectiveness as well as varying time frames of effectiveness<sup>27-31</sup>. Mifepristone (RU486), often referred to, as the "Abortion Pill", is not considered an emergency contraception because the mode of action is different than those deemed as EC<sup>32-33</sup>. Emergency contraceptives are believed to work by preventing the implantation of a fertilized egg into the uterus wall or blocking the fertilization of an egg<sup>31,34-36</sup>. Mifepristone however, acts after implantation has occurred and causes a shedding of the uterus lining, which will abort a implanted egg<sup>32,33</sup>. Emergency contraception in clinical trial settings has proven to be highly effective and safe at preventing pregnancy, with only mild side effects to the user<sup>31</sup>.

### Increased Access to Emergency Contraception

Much of the current literature and research regarding EC is focused on addressing the recent ruling by the FDA<sup>37</sup>, which did not give EC "over the counter" status<sup>38-40</sup>. The primary interest among researchers has been in addressing the fact that the sooner EC is taken after unprotected sex the more effective it is<sup>28,31,41,42</sup>. This has propagated a desire to explore the idea of "Pharmacy Access without a prescription" and "advanced provision of EC". The research regarding advanced supply and increased access to EC, has consistently concluded that women who are given it in advance or have it more readily

available, are more likely to use it but do not engage in riskier sex or give up more effective methods of primary contraception<sup>25,43-48</sup>. Based on this research, the States of Washington, California, Alaska, New Mexico, Hawaii, Maine, New Hampshire, Massachusetts, and most recently Vermont have all enacted laws that allow women to obtain EC from a pharmacist without a prescription<sup>49-51</sup>.

### Shift in Research Focus

A large proportion of the literature on EC is focused on probing for adverse behavioral effects associated with increased access<sup>45,-47,52-56</sup>. Recently a possible shift can be noted, with some studies examining whether EC is actually effective in reducing unwanted pregnancies, and abortions<sup>57-59</sup>. Currently no population-based study supports that EC reduces unwanted pregnancies or abortions<sup>57-59</sup>. A hypothetical model based on the projected effectiveness of EC, conducted in 1992 by James Trussell and others, is consistently cited in the literature and derives the expected reduction in pregnancy and abortion rates if EC was made more readily available<sup>25</sup>. Some researchers are beginning to claim that EC may not be the answer and are beginning to cast doubts as to the efficacy and feasibility of EC as a vital element in reducing overall abortion and pregnancy rates<sup>57,59</sup>.

### Who is Using/Seeking Emergency Contraception

Although the topic of EC has slowly become part of the Pro-Choice debate and is fueled by a great deal of emotion, understanding who is in need of EC would be beneficial to both sides of the argument. By discovering who may be at an increased risk of unwanted pregnancies and abortions, targeted information could be delivered to increase primary prevention, that is, use of more consistent and effective methods of birth

control. On the other hand, direct information regarding EC could be disseminated to these populations. This study will add to the growing body of literature about the differences between users and non-users of EC<sup>54-56,60-66</sup> with specific interest in the university population<sup>67,68</sup>. Although primarily comprised of the age group that is bearing a large proportion of unwanted pregnancies and abortions, EC use in this population is understudied<sup>69</sup>.

### The College Population

During the Spring 2004 semester, the American College Health Association (ACHA)'s National College Health Assessment (NCHA) was conducted on 74 different campuses in the United States. Over 47,000 surveys were collected and analyzed. Approximately 29,000 (~60%) of the respondents were female. Approximately 8% of the sexually active females had used EC within the last school year, and roughly 2% reported becoming unintentionally pregnant within the last year. Sexually active females on average had 1.25 partners within the last year, and approximately 11% reported having unprotected sex because of alcohol use within the last year<sup>70</sup>. Specific to the University of Hawaii at Manoa campus, 442 NCHA surveys were collected, of which 312 (~70%) were completed by females, with the mean age being 21.9 years. The average number of vaginal partners within the last year among females was 1.16, and approximately 3% or 9 individuals unintentionally became pregnant within the last year. At the University of Hawaii Manoa campus roughly 11% of females reported using EC within the last year, and 10% had unprotected sex in the last year that was reportedly a consequence of alcohol use<sup>71</sup>.

### Purpose of the Study

The goal of the proposed study is to identify differences between female WHC patients seeking EC and female WHC patients visiting the campus women's health clinic for other reasons. The focus is to classify "risk factors" that may lead to the need for EC, such as alcohol-related unprotected sex<sup>72,73</sup>. With a stronger understanding of who is more likely to seek EC, proper health promotional material can be developed that address skill-building as well as general education, and presented to the most suitable populations. This information could include primary prevention material to augment secondary prevention campaigns about EC. By combining these two types of prevention efforts a more balanced approach could be made to reduce the overall number of abortions and unintentional pregnancies locally.

## **Chapter II. Materials and Methods**

### **Study Design**

Data collection was carried out at the University Health Services' Women's Health Clinic (WHC) on the University of Hawaii at Manoa campus. The Manoa campus enrolls over 20,000 students with a diverse ethnic distribution<sup>74</sup>. From September 1 2005 to November 30 2005, the university health services at Manoa saw a total of 7661 patients, with 4605 females (60.1%). During this same timeframe the Women's Health Clinic had approximately 400 visits. The WHC serves primarily university students but is available to those outside this community as well. All women visiting the WHC who were 18 years or older and had not previously completed the survey were eligible to participate in the study.

Participants were enrolled from January 19, 2006 through April 7, 2006. The clinic was closed on weekends, Federal and State holidays, and during spring break (3/24/06 - 4/2/06) during which no participants were enrolled. Data were collected on a total of 50 days within this time frame. To obtain the best representation of this population in a short duration, all women visiting the WHC during the enrollment time were asked to participate in the study by filling out a short anonymous self-administered survey. Women were recruited in a consecutive manner in order to acquire an adequate sample size in a relatively short duration of time. No systematic bias was expected due to this selection process. However anecdotally it had been observed that an expected pattern would be a relatively large influx of women requesting EC on the first day after a weekend, holiday, or break from school.

At intake all women were asked to participate in the short self-administered survey while they waited to be seen by a doctor or nurse practitioner; those who initially agreed were given the informed consent document and the survey. Each woman was directed to read the informed consent document and complete the survey if they wanted to participate. A locked deposit box was available in the WHC for the women to return the completed surveys. The survey was voluntary and completely anonymous, with implicit informed consent; if the women returned the survey, the assumption was that she consented to participate. The locked deposit box was emptied every morning by the research before the clinic opened. The researcher had no access to the previous day's appointments and was not present during recruitment. The attending medical professional, nurses, and staff did not have access to the locked deposit box and did not know which patients actually completed the survey, or the answers given on the survey. Services at the WHC were not interrupted, delayed, or modified in any way. The survey took no longer than minimal waiting time to complete (less than 10 minutes).

#### Study Tool Development

The questions on the study tool were developed specifically for this study. In order to establish clarity and validity the survey tool was developed through an extensive literature review, conversing with medical professionals directly dealing with EC, medical form questionnaires at WHC, as well as patterning certain questions after those found in the American College Health Association's National College Health Assessment, and other related available survey instruments. The questions were developed with the intent to identify and understand the relationships among contraception practices, sexual activity, alcohol/drug use, and basic demographics with

respect to requesting EC. Multiple health educators, MD's, psychologists, epidemiologists, bio-statisticians and a nurse practitioner reviewed all questions presented on the questionnaire. The questions appearing on the instrument were developed by working with professionals in the field of women's health in college populations to allow for proper wording and clarity of potentially embarrassing, frustrating, and private questions. These questions were developed with high sensitivity to the very personal information asked in order to encourage a high response for these questions. Although this questionnaire is confidential and anonymous, answering questions about intimacy could have theoretically made women hesitant to complete the questionnaire thoroughly and completely.

The tool originally comprised 30 questions and was pilot tested among 25 female public health college students and 5 health professionals with direct contact to this population and subject matter. The pilot test exposed unclear and/or extraneous questions. After revisions were made to the tool, the final survey comprised 27 total questions and provided information on basic demographics, current contraceptive and sexual practices, past contraceptive and sexual practices, EC use and knowledge, as well as drug and alcohol use, and body image.

The study and tool were approved through The University of Hawaii Committee on Human Studies and given exempt status on December 22, 2005 (Attachment A & B).

To better understand who is seeking EC with regard to demographics, age, ethnicity, and college status were obtained. Age and college status are often highly correlated and were both included to understand which best explains any possible association. Because of the diverse ethnic population that attends UH and frequents the



health service, ethnicity was obtained in order to form a more detailed understanding of who is seeking EC.

Knowledge about EC was assessed through two multiple-choice questions. The first addressed the time within which EC should be taken in order to be effective. Although the current “standard” is that EC can be taken up to 120 hours after unprotected sex, the “traditional” 72 hours was used to determine correct timing in this study<sup>41,42</sup>. The second question dealt with the effectiveness of EC at reducing an individual’s chance of pregnancy. Although conflicting estimates exist with respect to actual effectiveness, the range of 75%- 95% was reported by the Cochrane collaboration<sup>31</sup>. It is also known that EC is more effective the sooner it is taken after unprotected sex or a sexual mishap<sup>31,41,42</sup>. For the purposes of this study, a correct response was 75%, 85%, or 95%. This range is justified because of the large variability in the literature and printed material from varying organizations promoting EC, as well as the varying effectiveness of the types of EC<sup>59</sup>. For informational purposes a question about “how” the participant learned about EC was also asked to help expose possible areas in which this population seeks this specific type of personal information.

Asking what method of contraception the student used during the last sexual intercourse addressed recent contraception use. Consistency or frequency of use was determined by asking the number of times in the past six months vaginal penile penetration occurred when no protection was used.

Sexual activity and its relation with EC were investigated by asking a set of questions exploring past and current sexual practices. Age at first vaginal penile intercourse, number of partners within the last year, number of times in the last six

months oral, vaginal and/or anal intercourse occurred and whether the subject had become unintentionally pregnant in the last year was used to gain a brief history of the participant's sexual practices. For the purpose of understanding historical behavior, the survey asked about the most recent sexual partner. Questions asked about the length of time subjects' knew their last partner before engaging in intercourse and for a description of this partner they were asked to identify them as casual or exclusive. In addition to these aspects one question was asked about if they have ever experienced a sexually transmitted diseases.

Alcohol and drug use was determined through a set of three questions. One question asked the students to determine their personal drinking patterns. This question was developed through the ACHA survey, professionals in the field of student alcohol prevention, and health educators. Number of drinks at last vaginal penile intercourse was assessed. The last question addressed illicit drug use by asking, "During your last sexual experience did you use...", followed by a list of choices.

### Analysis

The primary concentration of the study was to determine differences or "predictors" between women requesting EC and those visiting the WHC for other reasons. The interest was to identifying behavioral, knowledge, past sexual history, and key demographics that are associated with requesting EC. To accomplish this, the analysis was completed in three distinct steps. The first step was to perform basic descriptive statistics on the data, in order to look for coherency, identify obscure outliers, and give a general report on the overall sample. At this stage in the analysis only aggregate data were considered and simple statistical tests were performed to assess

consistency within variables. The second step was to divide the subjects into two groups; those who requested EC, and those who were being seen for other reasons. Tests for univariate relationships were performed by using Fisher's Exact test and t-tests with significance set at  $p=0.05$  level. It is known that a proportion of women visiting for other reasons could theoretically have used EC the day before the study began or have recently used: however, this would only drive the results towards the null, thus providing more conservative estimates of the differences between the two groups. The third step was to include associated variables and other relevant variables into relevant multi-variate models. Logistic regression was used to find independent associations in regard to requesting EC.

Data analysis was conducted with R statistical software and Stat-Xact. Data organization and compilation was conducted in Microsoft Access.

### **Chapter III. Results**

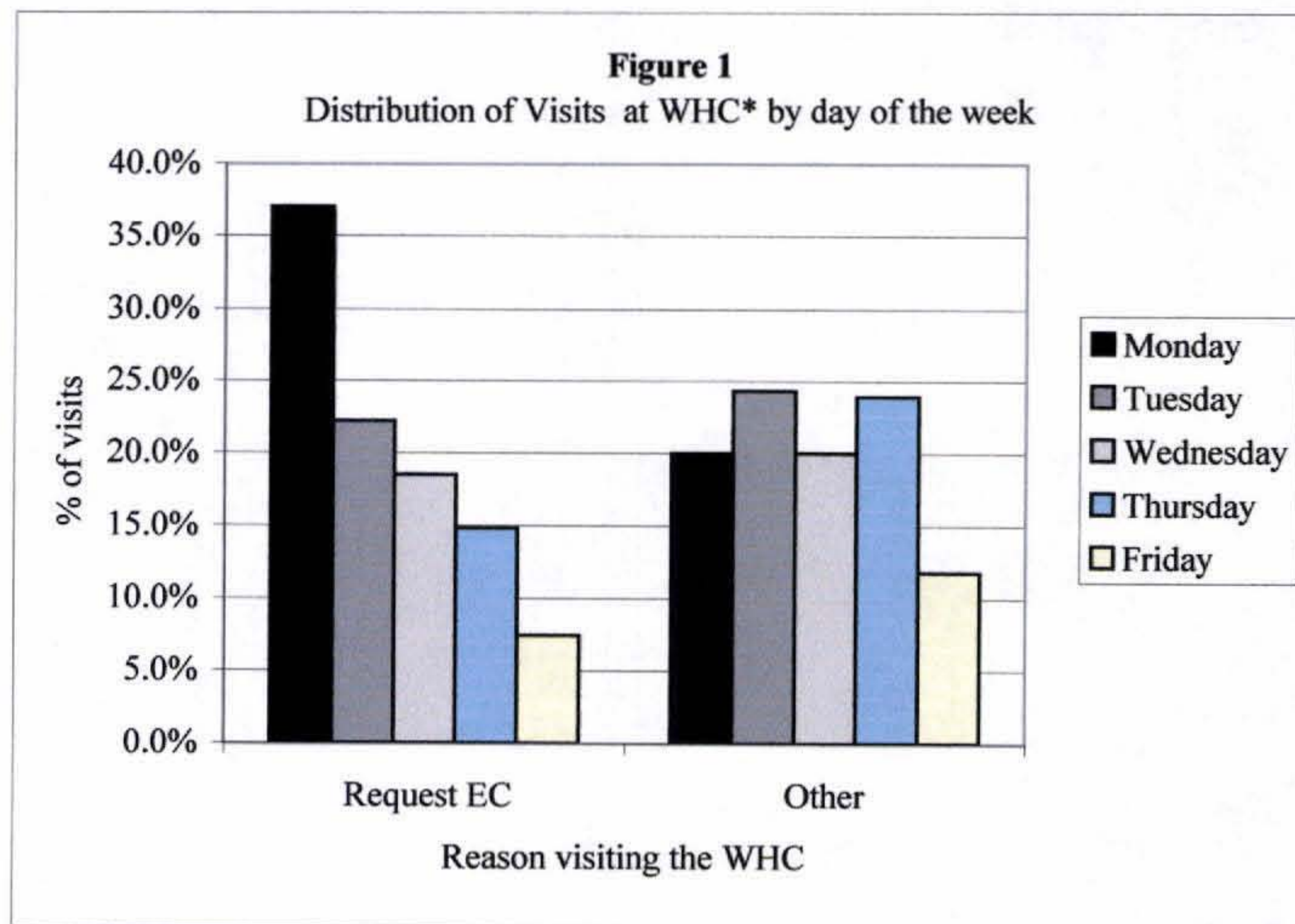
#### **Participants**

A total of 345 copies of the survey were given to the specialty clinics nurse who handled the WHC. Upon completion of the data collection period, of the 345 surveys, 6 were left over and not handed out, leaving a total of 339 surveys administered to women visiting the WHC. Three hundred and thirty-two of the 339 surveys (98.2%) were collected from the locked deposit box. All women who completed the survey were 18 years or older. Twelve individuals were excluded from the analysis because they reported that they had never participated in vaginal intercourse. These women were excluded because at the time of the survey they had not been “at risk” of needing EC and would therefore not be a fair comparison. Another 12 individuals were excluded because they reported having a husband. These women were excluded because they could have systematically different views and reactions to feeling at risk for pregnancy. After excluding these 24 women, 309 surveys were available for comparison by women requesting EC. Based on the number of days of actual data collection (50), on average 1.08 women were requesting EC per eligible day totaling 54 women requesting EC during the collection period.

A few individuals who visited WHC were not offered or given the chance to complete a survey because of shortage of staff, training of student staff, forgetting to hand it out, and other reasons. However, this gap is thought to be minimal and is not considered a potential for bias in the results, given the low number of these women missed and high response rate.

The four most frequent variables with missing values were: number of times the individual reported anal sex (22 missing); drug use at last sex (13 missing); number of times the individual reported having oral sex (12 missing); and the number of times the individual reported having vaginal sex (11 missing). Unanswered or ineligible responses appear to be proportionately distributed between those requesting EC and those visiting for other reasons.

Although the results were not significant ( $p=0.085$ ) it appears that the proportion of individuals requesting EC varies across the day of the week (Table 1). As was originally assumed, data confirmed that of those requesting EC, the largest proportion of persons requesting EC occurred on Monday (37%) and diminished as the week progressed (Figure 1).



\*WHC = Women's Health Clinic (located on the University of Hawaii Manoa campus).

When comparing Monday to all other days combined, by visit type. It was found that those who were requesting EC were at 2.35 (95% CI=1.18 – 4.60) greater odds to be visiting on a Monday than those visiting the WHC for other reasons ( $p=0.0118$ ).

### Demographics

The overall description of the data set consisted of analyzing and evaluating the variability of demographic characteristics. The mean age for those who completed the survey was 22.8 years old, with a range from 18 years to 36 years old. The top five reported Race/Ethnicity categories were Caucasian 42.9%, Japanese 17.2%, Mixed 8.8%, Filipino 6.2%, and Hawaiian/part Hawaiian 6.2% (Table 1). Within this data set 22.5% were graduate students, and 11.9% were 1<sup>st</sup> year students, with the rest being largely evenly distributed across the stratum (Table 1).

Upon completion of the initial aggregate analysis, the data set was divided into two major groups, and of the 309 surveys available for analysis 17% (54) were requesting EC and 83% (255) were coming in to be seen for other reasons. Again, basic demographics (age, race, day of the week, and college status) were compared between the two groups. Those requesting EC were on average younger at 21.6 years old, than those visiting for other reasons, 23.1 years old ( $p=0.005$ ). No statistical difference was found among racial groups  $p=0.0878$  using an omnibus Fisher's exact test (Table 1). Although not statistically significant at the 0.05 cut off, considering the relatively small sample size in the "requesting EC" group, the differences in proportions among groups could warrant future investigation of race (Table 1). When compared with Caucasians, however, those that identified as being Filipino were at greater odds to request EC (OR=3.5,  $p=0.02$ ).

**Table 1. Frequency Distribution of Demographic Characteristics**

Variables	N (N=309)	Requesting EC		P value
		Yes (N=54) no. (%)	No (N=255)	
<b>Date</b>	309			
Monday	71 (23.0)	20 (37.0)	51 (20.0)	0.085
Tuesday	74 (23.9)	12 (22.2)	62 (24.3)	
Wednesday	61 (19.7)	10 (18.5)	51 (20.0)	
Thursday	69 (22.3)	8 (14.8)	61 (23.9)	
Friday	34 (11.0)	4 (7.4)	30 (11.8)	
<b>Age</b>	307			
Mean (SD)	22.84 (4.09)	21.57 (3.41)	23.11 (4.17)	0.00552
<b>Race or Ethnicity</b>	308			
Caucasian/White	132 (42.9)	19 (35.2)	113 (44.5)	0.0878
Chinese	16 (5.2)	0 (0.0)	16 (6.3)	
Filipino	19 (6.2)	7 (13.0)	12 (4.7)	
Hawaiian/Part Hawaiian	19 (6.2)	3 (5.6)	16 (6.3)	
Hispanic	11 (3.6)	2 (3.7)	9 (3.5)	
Japanese	53 (17.2)	11 (20.4)	42 (16.5)	
Pacific Islander- Not Hawaiian	16 (5.2)	1 (1.9)	15 (5.9)	
Mixed*	27 (8.8)	7 (13.0)	20 (7.9)	
Other*	15 (4.9)	4 (7.4)	11 (4.3)	
<b>Current college status</b>	302			
1st year	36 (11.9)	8 (15.1)	28 (11.2)	0.121
2nd year	49 (16.2)	14 (26.4)	35 (14.1)	
3rd year	56 (18.5)	8 (15.1)	48 (19.3)	
4th year	54 (17.9)	12 (22.6)	42 (16.9)	
5th year or more	27 (8.9)	2 (3.8)	25 (10.0)	
Graduate	68 (22.5)	8 (15.1)	60 (24.1)	
Not currently a student	12 (4.0)	1 (1.9)	11 (4.4)	

EC=emergency contraception; SD=standard deviation

\*Mixed = Individuals self-identified as "mixed"

\*\*Other = All Races that were 2% or less of the data set identified with (Alaskan Native, Korean, Black or African-American, American Indian or Alaskan Native, Taiwanese and Vietnamese).

All other races were not statistically different from Caucasians (data not shown). College status was not statistically different between the two groups (Table 1).

### Knowledge of Emergency Contraception

Individuals requesting EC were at a significantly greater odds than the non-EC group to identify 72 hours as the time by which EC needs to be taken to be effective ( $p < 0.001$ ) (Table 2). Interestingly, none of those requesting EC reported that EC could be taken up to 120 hours after sex, which is now considered to be standard (Appendix C).

**Table 2. Correctness of Knowledge About Emergency Contraception**

Variables	N	Requesting EC		Odds Ratio (95% CI)	P value
		Yes (N=54) no. (%)	No (N=255) no. (%)		
<b>Use by 72 hours</b>					
Correct	221 (71.5)	49 (90.7)	172 (67.5)	4.71 (1.79 - 15.75)	<0.001
Incorrect	88 (28.5)	5 (9.3)	83 (32.5)		
<b>Effectiveness of EC*</b>					
Correct	259 (83.8)	48 (88.9)	211 (82.7)	1.67 (0.65 - 5.06)	0.3144
Incorrect	50 (16.2)	6 (11.1)	44 (17.3)		
<b>Responded correctly to both knowledge questions*</b>					
Yes	198 (64.1)	44 (81.5)	154 (60.4)	2.88 (1.35 - 6.71)	0.00296
No	111 (35.9)	10 (18.5)	101 (39.6)		

\*Effectiveness is determined by answering (75%, 85%, and 95%), because of the large variability of stated effectiveness in the literature.

\*\*Identifying both the correct time by which to take EC and effectiveness at reducing pregnancy.  
EC = emergency contraception; CI = confidence interval.

Women requesting EC were at no greater odds to identify the correct effectiveness than those visiting for other reasons ( $p = 0.3144$ ) (Table 2). Approximately 88.9% of those requesting EC and 83.0% of those visiting for other reasons identified that its effectiveness is between 75%-95%. (Appendix C)



Overall correct knowledge was determined from correct responses to both multiple-choice questions on the questionnaire. Allowing for the variability in the effectiveness of EC, women seeking EC were at 2.88 greater odds to have correct knowledge regarding both the timeframe to take EC within and how effective it is at reducing the risk of pregnancy ( $p=0.0031$ ) (Table 2).

**Table 3: Mode of Learning About Emergency Contraception\***

Variable	Total (N=309)	Requesting EC	
		Yes (N=54)	No (N=255)
	no. (%)		
Friend	123 (39.8)	30 (55.6)	93 (36.5)
Pamphlets	119 (38.5)	26 (48.1)	93 (36.5)
Medical Professional	84 (27.2)	15 (27.8)	69 (27.1)
High School class	66 (21.4)	11 (20.4)	55 (21.6)
TV	59 (19.1)	9 (16.7)	50 (19.6)
Internet	53 (17.2)	10 (18.5)	43 (16.9)
College class	31 (10.0)	4 (7.4)	27 (10.6)
Never learned about it	20 (6.5)	0 (0)	20 (7.8)
Clinic poster	12 (3.9)	1 (1.9)	11 (4.3)
Parents	12 (3.9)	2 (3.7)	10 (3.9)
Other Professional	9 (2.9)	1 (1.9)	8 (3.1)
Siblings	8 (2.6)	2 (3.7)	6 (2.4)
Radio	4 (1.3)	2 (3.7)	2 (0.8)
Planned parenthood	3 (1.0)	1 (1.9)	2 (0.8)
Newspaper	2 (0.6)	0 (0)	2 (0.8)

\*Values sum to more than 100% because multiple selections were possible.

The two most common methods for individuals to learn about EC were through friends (39.8%) and pamphlets (38.5%). These were consistent across both groups (Table 3). Of the top 6 most common methods for learning about EC further

investigation of correct knowledge was assessed (Table 4). The two modes of learning with the most correct answers among individuals requesting EC were

**Table 4. Top Six Most Common Methods for Learning About Emergency Contraception and Correctness Knowledge\***

<b>Visit = EC</b>				<b>Visit = Other</b>			
	<b>Correct</b>	<b>Wrong</b>	<b>% Correct</b>		<b>Correct</b>	<b>Wrong</b>	<b>% Correct</b>
Med professional	12	3	80.0%	Internet	33	10	76.7%
Internet	8	2	80.0%	Pamphlets	65	28	69.9%
TV	7	2	77.8%	Med professional	48	21	69.6%
Pamphlets	20	6	76.9%	Friend	64	29	68.8%
High school	8	3	72.7%	High school	35	20	63.6%
Friend	21	9	70.0%	TV	28	22	56.0%

*\*Correctness of knowledge determined by correctly identifying both the correct amount of time by which EC must be taken, and the effectiveness at reducing pregnancy.*

*EC=Emergency contraception*

from medical professionals (80% correct) and the Internet (80% correct). Among those visiting the WHC for other reasons, 69.6% reported correct answers when stating they learned about EC from a medical professional, and 76.7% correct with the Internet (Table 4). Correct knowledge appears to be fairly consistent across modes of learning for individuals requesting EC, but differs more widely among those visiting for other reasons.

Predicted usage of EC within the next three months was obtained. Among those that were requesting EC, having a more favorable view of future usage was apparent ( $p < 0.001$ ). It was found that women requesting EC were at a greater odds to perceive that they could possibly use EC within the next three months (OR = 6.55 (3.22 – 13.42).

#### Most Recent Sexual Intercourse

Within the context of the most recent vaginal intercourse experience, the two groups appear to be very similar with one distinct difference (Table 5). Although

multiple birth control methods can be used, the “primary” or most effective method of preventing pregnancy was considered. When compared with the “Best” (hormonal and IUD) methods to prevent pregnancy, those that were requesting EC were at greater odds to use less effective methods to prevent pregnancy or no method at all compared to those visiting WHC for other reasons (Table 5).

**Table 5. Frequency Distribution of Most Recent Intercourse**

Variable	N	Requesting EC		OR (95% CI)	P value
		Yes	No		
		no. (%)			
<b>Length knew last partner</b>	302				0.0225
Knew last partner ≥ 1 year	159 (52.6)	20 (37.7)	139 (55.8)		
Knew last partner < 1 year	143 (47.4)	33 (62.3)	110 (44.2)	2.08 (1.09-4.05)	
<b>Primary birth control *</b>	309				
(r)Best (Hormonal or IUD)	178 (57.6)	12 (22.2)	166 (65.1)	1	
Good (Barrier methods)	94 (30.4)	30 (55.6)	64 (25.1)	6.48 (3.11-13.38)	<0.001
Poor (Withdrawal)**	22 (7.1)	8 (14.8)	18 (7.4)	7.91 (2.77-22.54)	<0.001
Nothing	15 (4.9)	4 (7.4)	11 (4.3)	5.03 (1.39-18.19)	0.0138
<b>Describe last partner</b>	304				0.1806
Casual	59 (19.4)	14 (26.4)	45 (17.9)	1.64 (0.76-3.41)	
Exclusive	245 (80.6)	39 (73.6)	206 (82.1)		

*\*This was determined by the most effective method used in preventing pregnancy.*

*\*\*Also included Fertility awareness and Spermicide. EC = emergency contraception.*

*IUD = IntraUterine Device; OR = Odds Ratio; CI = Confidence Interval.*

*(r) = Reference group for Logistic regression computation*

Both groups were not statistically different in how they described their most recent sexual partner, casual or exclusive (p=0.1806) (Table 5). Although not significant the EC group appears to have a non-significant trend towards the hypnotized direction. A casual partner was determined by all those responses that were not consistent exclusive partners. In addition to how the most recent partner is described, length they have

known the most recent partner was also asked. Determining if the most recent partner was a relatively new acquaintance could have implications as to the choice of contraception used during intercourse. It was found that EC requestors were at greater odds to have known their most recent partner for less than one year ( $p=0.0225$ ) (Table 5).

### Substance Use

Marijuana use at last sex and frequency of alcohol consumption were not statistically different between the two groups (Table 6). Amount of alcohol consumed

**Table 6: Frequency Distribution of Substance Use Among Women Visiting WHC\***

	N	Requesting EC		P value
		Yes	No	
		no. (%)		
<b>Drugs at last intercourse</b>				
<b>Marijuana</b>	296			0.1073
Yes	26 (8.8)	4 (7.7)	22 (9.0)	
No	270 (91.2)	48 (92.3)	222 (91.0)	
<b>Alcohol</b>	305			0.0201
Never	30 (9.8)	6 (11.1)	24 (9.6)	
None at last intercourse	196 (64.3)	29 (53.7)	167 (66.5)	
1 - 3 drinks	52 (17.0)	8 (14.8)	44 (17.5)	
4 or more drinks	27 (8.9)	11 (20.4)	16 (6.4)	
<b>Frequency of alcohol use</b>	301			0.3459
Lifelong non-drinker	20 (6.6)	6 (11.1)	14 (5.7)	
Not a current drinker	16 (5.4)	4 (7.4)	12 (4.8)	
Drank at least once in past year	63 (20.9)	9 (16.7)	54 (21.9)	
Drink 1 - 6 times a month	142 (47.2)	22 (40.7)	120 (48.6)	
Drink 2+ times a week	60 (19.9)	13 (24.1)	47 (19.0)	

\*WHC = Women's Health Clinic.

at the most recent sexual intercourse was assessed only among users of alcohol. There appeared to be an association with use of alcohol and requesting EC, using a general test of significance ( $p=0.0201$ ) (Table 6). Upon further investigation, the data indicate that individuals who consumed 4 or more drinks at their most recent vaginal intercourse at

greater odds to be requesting EC when compared with those who consumed 1-3 drinks (Table 7). Although not significant with any drinking at last sex, it looks as if use of alcohol at increased levels or binge drinking is associated with requesting EC (p=0.0795).

**Table 7: Analysis of Specific Alcohol Use at Last Intercourse\***

	N (%)	OR (95% CI)	P value
<b>Any alcohol at last sex</b>	275 (90.2)		
Yes	79 (28.7)	1.82 (0.89 - 3.64)	0.0795
No	196 (71.3)		
<b># Of drinks at last sex*</b>	79 (28.7)		
4 or more drinks	27 (34.2)	3.71 (1.13 - 12.81)	0.0244
1 - 3 drinks	52 (65.8)		

\*Among those that claimed they have "ever" drank alcohol.

\*\*Only those who consumed alcohol at last intercourse.

### Past Sexual Experiences

Among this population 50.2% reported ever using EC, 85.2% of those requesting EC, and 42.7% of those visiting for other reasons (Table 8). Age at first vaginal intercourse, average number of partners in the last year, frequency of vaginal, oral, and anal sex (data not shown), and ever testing positive for an STD, were all found to be very similar between the two groups (Table 8). Having had unprotected sex within the past 6 months, past use of EC, feeling at risk of pregnancy because of unprotected sex, having ever had an abortion, having ever had a pregnancy, and having had an unwanted pregnancy within the last year were all significantly associated with requesting EC (Table 8). Of the total sample, 4.5% reported an unintentional pregnancy within the past year. 13% of the requesting EC group had experienced an unintentional pregnancy within the last year, while only 2.7% in the other group. It was also discovered that 20.4% of those

requesting EC reported ever experiencing an abortion while only 9.1% in the group visiting WHC for other reasons (Table 8).

Past users of EC were at 7.65 greater odds to be currently requesting EC ( $p < 0.001$ ) (Table 8). When compared with those that had not used EC in the past year, those seeking EC were at greater odds to have used it one, or two or more times within the past year (Table 8). Those requesting EC were at 5.24 greater odds to have experienced an unwanted pregnancy within the last year ( $p = 0.0044$ ), as well as at 2.55 greater odds to have ever experienced an abortion (Table 8). Participants were asked if after sexual intercourse they had ever felt “at risk” for an unwanted pregnancy, and to identify the primary reason for feeling they may be or have been at risk. Unprotected sex was identified as all responses where no form of contraception was used at intercourse. Back-up to birth control was identified when any form of contraception was used at intercourse but was defective, used incorrectly, or the person was just being cautious. Among those requesting EC, individuals feeling at risk for pregnancy were at an increased odds of 2.4 to have stated they felt at risk because of unprotected as opposed to a birth control problem or precautionary measure to back up the birth control method (Table 8). Also 81.5% of those women requesting EC stated having unprotected sex in the past six months at least once.

**Table 8. Frequency Distribution of Sexual History Characteristics**

Variable	N	Requesting EC		OR (95%CI)	P value
		Yes	No		
		no. (%)			
<b>Ever used EC</b>	<b>309</b>				<b>&lt;0.001</b>
Yes	155 (50.2)	46 (85.2)	109 (42.7)	7.65 (3.40-19.55)	
No	145 (49.8)	8 (14.8)	146 (57.3)		
<b>Frequency of EC use in past year</b>	<b>309</b>				
(r)0 times	202 (65.4)	8 (14.8)	194 (76.1)	1	
1 time	74 (23.9)	25 (46.3)	49 (19.2)	12.37 (8.00-19.14)	<0.001
2+ times	33 (5.2)	21 (38.9)	12 (4.7)	42.44 (15.59-115.53)	<0.001
<b>Risk of pregnancy*</b>	<b>216</b>				<b>0.0067</b>
BC problem (contraception used)	115 (53.2)	19 (36.5)	96 (58.5)		
No contraception used	101 (46.8)	33 (63.5)	68 (41.5)	2.44 (1.23-4.96)	
<b>Unprotected sex in past six months</b>	<b>302</b>				<b>&lt;0.001</b>
Yes	164 (54.3)	44 (81.5)	120 (48.4)		
Not in past six months	64 (21.2)	4 (7.4)	60 (24.2)		
Never had unprotected sex	74 (24.5)	6 (11.1)	68 (27.4)		
<b>Ever experienced</b>					
<b>STD</b>	<b>309</b>				<b>0.8532</b>
Yes	62 (20.1)	10 (18.5)	52 (20.4)	0.89 (0.37-1.94)	
No	247 (79.9)	44 (81.5)	203 (79.6)		
<b>Unwanted pregnancy</b>	<b>308</b>				<b>0.0395</b>
Yes	39 (12.7)	12 (22.2)	27 (10.6)	2.39 (1.02-5.36)	
No	269 (87.3)	42 (77.8)	227 (89.4)		
<b>Abortion</b>	<b>307</b>				<b>0.0285</b>
Yes	34 (11.1)	11 (20.4)	23 (9.1)	2.55 (1.04-5.93)	
No	273 (88.9)	43 (79.6)	230 (90.9)		
<b>Unwanted pregnancy (in last year)</b>	<b>309</b>				<b>0.0043</b>
Yes	14 (4.5)	7 (13.0)	7 (2.7)	5.24 (1.49-18.40)	
No	295 (95.5)	47 (87.0)	248 (97.3)		
<b>Age at first intercourse</b>	<b>305</b>				<b>0.3094</b>
16 or under	105 (34.4)	16 (30.8)	89 (35.2)		
17-19	153 (50.2)	31 (59.6)	122 (48.2)		
20+	47 (15.4)	5 (9.6)	42 (16.6)		
<b># Of partners within last year</b>	<b>309</b>				
Mean	2.22	2.78	2.11		0.0163

*\*Those that responded to ever feeling at risk of unwanted pregnancy after intercourse. This compared those that felt "at risk" because of not using any form of birth control with those that did use some form of birth control, between groups. (r) = reference group for the variable; OR = Odds Ratio; CI = Confidence Interval.*

### Multivariate Analysis

For the three major variables of interest, alcohol use at last sex, characteristics of most recent sex, and past sexual history, logistic regression models were estimated to find key independent associations. Within all three models, perception of future use was included. Having a positive perception of future use could have a confounding effect, or an important variable influencing actual behavior, so it is considered relevant to all three separate logistic models.

After adjusting for type of contraception used at most recent intercourse, age and likelihood of use within the next three months, binge drinking was still significantly associated with requesting EC. Those requesting EC were at increased odds of 3.48 of having had 4 or more drinks at last intercourse (Table 9). With adjustments for contraceptive use and perception of future use, the only remaining variable not significant

**Table 9. Multivariate Analysis of Contraception & Alcohol at Most Recent Intercourse**

	<b>OR (95% CI)</b>	<b>P value</b>
<b>Age</b>	<b>0.87 (0.73-1.05)</b>	<b>0.1405</b>
<b>Contraception used at last sex*</b>		
(r)Best (Hormonal or IUD)	1	
Good (Barrier)	2.24 (0.52-9.66)	0.2793
Poor (Withdrawal, Spermicide, Fertility awareness)	4.59 (0.57-37.27)	0.1538
Nothing	7.09 (1.0-50.52)	0.0506
<b>Alcohol</b>		
4 or more at last sex <sup>†</sup>	3.48 (1.03-11.73)	0.0441
<b>Predicted use EC in 3 in months</b>		
Likely	0.38 (0.09-1.56)	0.1775

*\*This was determined by the most effective method used in preventing pregnancy.*

*†Comparing only those that drank at last intercourse (4 or more with 1-3 drinks).*

*(r) = Reference group for Logistic regression computation.*

*IUD = IntraUterine Device; OR = Odds Ratio; CI = Confidence Interval.*



(although of borderline significance), was use of “nothing” for type of contraception used at last intercourse when compared to the best methods (Table 9). Interestingly, perception of future use was no longer significant in this model ( $p=0.1775$ ).

Key variables were included in a model to assess associations between past sexual history and requesting EC. Included in the model were age at first intercourse, number of partners during the last year, ever had an abortion, unintentionally pregnant during last year, reason for ever thinking could be at risk for pregnancy (birth control problem, or unprotected sex), and perception of future use. After including these key indicators of sexual risk and history into the logistic model, the significant variables were, feeling at risk of pregnancy because of unprotected sex as opposed to a birth control failure ( $p=0.0318$ ), and having a positive perception of future use of EC within the next three months ( $p<0.001$ ) (Table 10).

**Table 10. Multivariate Analysis of Past Sexual History**

	OR (95% CI)	P value
<b>Age at first vaginal intercourse</b>		
(r)16 or under	1	
17 – 19	0.91 (0.42-1.99)	0.8213
20+	0.55 (0.15-2.08)	0.3822
<b>Number of partners during last year</b>	1.00 (0.88-1.14)	0.9449
<b>Ever had abortion</b>	1.69 (0.48-5.91)	0.4135
<b>Unintentionally pregnant during last year</b>	2.89 (0.60-13.87)	0.184
<b>Reason for "thinking" at risk for pregnancy*</b>		
Unprotected sex	2.20 (1.07-4.53)	0.0318
<b>Predicted use EC in next 3 months</b>		
Likely	5.21 (2.45-11.10)	<0.001

(r) = Reference group for Logistic regression computation.

OR = Odds Ratio; CI = Confidence Interval;

\*Risk of pregnancy was grouped into two categories, unprotected sex where no form of protection was used to prevent pregnancy and used some form of protection and “backing it up”.

The most recent sexual experience was evaluated by including frequency of EC use during the past year, activity of vaginal intercourse within the past six months, how the most recent partner was described (Casual or Exclusive), and perception of future use. Using EC one and two or more times were significantly associated with requesting EC, as well as feeling that EC use within the next three months is likely (Table 11). Controlling for vaginal sex activity and past and expected use of EC, individuals requesting EC were at 3.94 greater odds of describing their most recent partner as “Casual” (Table 11). Activity of vaginal intercourse remained insignificant and appears to be fairly constant between these two groups.

**Table 11. Multivariate Analysis of Most Recent Sex Characteristics**

	<b>OR (95% CI)</b>	<b>P value</b>
<b>Frequency of EC use in past year</b>		
(r)0 times	1	
1 time	10.90 (4.31-27.47)	<0.001
2 or more times	38.46 (12.56-117.77)	<0.001
<b>Activity of Vaginal intercourse (past 6mo.)</b>		
(r)Low (1-10 times)	1	
Moderate (11-20 times)	1.41 (0.51 - 3.90)	0.5103
High (21+ times)	1.52 (0.62 - 3.76)	0.3623
<b>Describe last partner*</b>		
Casual	3.94 (1.51 - 10.24)	0.005
<b>Predicted use EC in 3 months</b>		
Likely	4.01 (1.80-8.97)	<0.001

*(r) = Reference group for Logistic regression computation.*

*OR = Odds Ratio; CI = Confidence Interval; EC = emergency contraception*

*\*Last partner was grouped into exclusive or casual partners.*

## **Chapter IV. Comments**

### **Discussion**

A large proportion of this population (over 50%) has previously used EC. This high proportion of use raises questions as to the efficacy and importance of EC within this type of population and reasons for its continued use or nonuse among these women.

Use of emergency contraception is considered a back-up to primary birth control and is largely promoted as a “Back-up your Birth control” method by many organizations<sup>75-79</sup>. However of those requesting EC, 81.5% indicated having unprotected sex when asked about birth control use used within the past six months. They were also at 2.4 greater odds of ever feeling at risk for a pregnancy because of unprotected sex (as opposed to a birth control failure or mishap). It was also discovered that women requesting EC were more likely to have used less effective methods at their most recent intercourse when compared with the “best” methods of preventing pregnancy. These findings suggest that the women requesting EC are not consistently protecting themselves with a form of primary birth control, or are using less effective methods of primary birth control, thereby putting themselves at a greater risk of a STD and/or unwanted pregnancy. In addition, women seeking EC were more likely to have used it 1 ( $p<0.001$ ), or 2 or more times ( $p<0.001$ ) within the last year. This supports the idea that this is predominantly not an isolated incident and could likely be needed again in the future. In fact, those requesting EC were at 6.5 greater odds of reporting that they would likely use EC within the next three months. Although conclusions must be tentative, it seems that those women seeking EC perceive that they will again engage in a sexual experience that should be protected with a form of primary contraception to reduce the risk of pregnancy.

Within this highly sexually active population being concerned only with pregnancy prevention seems incomplete since 20.1% reported ever experiencing an STD, whereas only 12.7% have ever unintentionally become pregnant. It was found that women who were currently requesting EC were less likely to have used effective birth control, had used EC multiple times in the last year, and experienced a higher proportion of unwanted pregnancies and abortions. Within the context of this multivariate model and adjusting for multiple past sexual history factors (Table 10), the only independent associations remaining were feeling at risk for possible pregnancy because of unprotected sex where no form of birth control was used and feeling that EC might be used within the next three months.

These findings suggest that this population might benefit from comprehensive sexual responsibility and contraception awareness education that promotes the use of an effective primary method of contraception; that is, it is proactive (before sexual contact) not reactive (prior to sexual contact). Compartmentalizing the gamut of sexual responsibility would seem to be a mistake with this population, and perhaps any population.

Studies have shown that alcohol use is strongly associated with unsafe sexual risk taking<sup>72,73</sup>. One focus of this study was to look not only at any alcohol use at last intercourse but also specifically distinguish between safe and unsafe drinking at the most recent intercourse.

No statistical difference was found between any alcohol use at most recent sex and no use of alcohol ( $p=0.0795$ ). However when only those who consumed alcohol at the most recent intercourse were evaluated, those requesting EC were at 3.71 greater odds

of drinking four or more alcoholic beverages at the most recent intercourse than those visiting for other reasons. This supports the notion that an unsafe drinking pattern, not any alcohol use per se, is what is primarily associated with negative consequence related to sexual risk taking. Four or more alcoholic beverages is generally considered binge drinking for females; at this level individuals are more likely to do things they would have otherwise not done, like having unprotected sex<sup>73</sup>. Unsafe alcohol use could impair even the best decision makers and should therefore be included in addressing sexual health and responsibility. Again, by focusing solely on promoting EC as opposed to a more comprehensive approach, a key relationship would be overlooked: alcohol use and decision-making in relation to unsafe sexual practices, which seems to play a key role in needing and requesting EC. When adjusting for age, type of contraception used at most recent intercourse, and perception of future EC use, binge drinking was still highly associated with requesting EC (Table 11), and the use of any contraception method was no longer significantly different between the two groups. Perception of future use was no longer significant; suggesting that women may feel this is an isolated incident because of drinking and may feel that they have control over their drinking. Despite differences in sexual history, women under the influence of alcohol are less likely to make good decisions with contraception and use less effective methods or no method at all<sup>73</sup>. An apparent need is to focus not only on contraception but also focus on contraception in relation to substance use with this population.

In particular, overall sexual history and risk taking were similar between the two groups, which is most likely due to the fact that a large proportion of the comparison group had used EC at some point previous to the current visit and could have very similar

experiences. This dilution of characteristics would ultimately drive the results towards insignificance. It also appears that both groups of women have very similar sexual practices that put them at risk for negative outcomes associated with sexual activity, like having multiple partners. One specific area that became exposed was in regard to recent partners. Controlling for activity of vaginal intercourse (which was very similar between the two groups) and frequency of EC use in the past year, those currently requesting EC were more likely to describe the last partner as casual as well as to perceive future use of EC within the next three months. This adjustment allowed for a comparison to be made that would help expose how the most recent partner is described and adjust for the fact that these two groups engage in very similar sexual activities. Thus, in this population there appears to be a need for primary providers and health educators in understanding the relationship women are involved in as well as the choice or reported choice of sexual partner.

Knowledge about EC has been previously shown to be lacking among many different populations, and increasing knowledge could theoretically increase use of EC<sup>60-63,80</sup>. Although a little over 50% of the total population had ever used EC, a distinct difference in knowledge existed between those requesting EC and those visiting WHC for other reasons (although this knowledge was not entirely up-to-date). One explanation for this difference could be that those who are in need of EC may be more likely to pay particular attention to specific details about it. Also the areas in which information is sought may differ and could be accessed with more intensity and more recently by an individual who currently feels a need for it. In addition, over 85% of those requesting EC had previously used EC and could be more comfortable with it and seeking it. Although

current standards are that women have up to 120 hours after sex to take EC, this is a relatively new standard<sup>44</sup> and many women may not have been familiar with this new information. Using 72 hours as the cutoff timeframe, those requesting EC were at 4.71 greater odds of identifying this correctly.

Knowledge about the effectiveness of EC was comparable between the two groups when allowing the responses about effectiveness to range between 75% and 95%. In a quick web search, stated effectiveness of EC ranges greatly depending on the method of EC. This variation in efficacy and statements that EC is more effective the sooner it is taken could all be contributing to the confusion of the actual users. Although more than one type of EC is currently available, most statistics on efficacy and timeframe seem to be referring to the “Plan-B” regimen unless otherwise stated<sup>75-79</sup>. The fact that both groups were similar is encouraging, in that the vast majority of this population is fairly well educated with respect to the effectiveness of EC.

Although not statistically significant across the day’s of the week, there may be a “weekend effect” (Figure 1). In fact when collapsing all other days of the week and comparing it to Monday, it is found that those requesting EC are more likely to be requesting it on Monday than the other days of the week when compared to those visiting for other reasons. This suggests that during the weekend this population is at an increased risk for needing EC on Monday at the clinic. Knowing that women are particularly vulnerable on weekends, time specific interventions could be formulated to address both sexual responsibility and safe drinking during these periods. This also raises the question about opening the clinic for limited weekend hours. Future investigation of a

“weekend” or “holiday” effect could be interesting and might be explained because of the types of behaviors engaged in during these short breaks by this population.

The top mode of obtaining knowledge about EC was from a friend (39.8%). This has possible implications for how someone in this population prefers to seek information regarding this kind of topic. The second most commonly reported method was pamphlets (38.5%). These two modes of learning are very noninvasive and comfortable. Possible applications of this would be to promote sensitive material in a very non-judgmental, non-authoritative, and non-accusing manner to this population. This information could be strategically printed in campus newspapers, and placed in high traffic areas accessed by this population. The participants in this study appeared to be fairly well informed about EC, with those requesting being a little more accurate. Improving and updating the accuracy of the knowledge about EC among this population seems less vital in reducing unintentional pregnancies and abortions than promoting primary contraception methods, and safe drinking habits.

### Limitations

Because of the nature of this study several limitations are apparent. First is the sampling procedure. All women were asked to participate and a majority did (98.2% response rate) it is thought that this is a representative sample of those who visit WHC because it is a largely all-inclusive sample covering a large portion of the 2006 spring semester. Because women were only allowed to participate once, the frequency of visits of participants should not have affected the results. To account for this sampling problem specific questions were designed to address past sexual practices and usage of EC within the past year.



Second the utilization of EC at the WHC may have been affected during this semester because of a sexual health and responsibility campaign that was carried out at UH-Manoa during the same period. However, this is thought not to have biased the results in any significant manner because only 10% of the sample stated learning about EC in a college class.

Third, because this is a cross-sectional study the time sequence of events is difficult to determine and extreme caution should be taken in citing any causal relationships. However, to help reduce this effect the data were collected at intake when women were requesting EC, which allowed for a fair examination of events shortly preceding the current need for EC. Strong associations were found between many variables, which could be investigated further with other appropriate study designs; like cohort study that enrolled freshman females and followed them prospectively throughout their college stint.

Although this study was performed at the university WHC, this sample is not considered representative of the campus population and care should be taken on extrapolating these results beyond the study group. The study was designed to capture a “snap shot” of women visiting the WHC in order to help identify “higher risk”. If someone is repeatedly seeking EC, motivating and encouraging the adoption of more effective primary birth control could be enhanced with knowledge of common predictors for seeking EC. However, because it is unknown who will use the services regularly among the university population at any given time, the recommendations and conclusions found in this study should be applied and delivered not only to those visiting the WHC, but also to the entire campus community.

## Recommendations

Based on these findings further research should incorporate a more dynamic approach through the use of a prospective cohort or community based intervention study. The findings also support a focus on presenting a more comprehensive sexual responsibility education plan as opposed to fragmented individual campaigns of various aspects of sexual health. This plan should incorporate primary and secondary contraception use, choice of partners, and substance use, as well as practical and relevant STD information. By focusing strictly on one aspect of sexual responsibility, the resources, effort, reach, and effectiveness at reducing overall negative sexual consequences are greatly reduced. Emergency contraception is a great option to “back-up” a birth control failure, but should in no way replace a regular and consistent method of birth control. If a need arises for EC, not only is an individual at risk for pregnancy but could also be at risk of an STD, which appears to be a larger burden within this population.

This study suggests that health professionals in a college health center should recognize that individuals currently requesting EC could benefit from receiving comprehensive sexual health education and skill building that includes negotiation and refusal skills, dangers of binge drinking, benefits of adopting and consistently using a primary birth control/STD method, how to have a safe and responsible weekend, as well as information regarding EC as a true back up method. Identifying perceived future use of EC could stand as a benchmark as to the type of information the individual would most likely respond to in a clinical setting. Through the use of Motivational Interviewing (MI) techniques<sup>81</sup> the practitioner could use the “perceived” future need to help guide the

individual into identifying a more proactive primary contraception use or behavioral modifications that would reduce the need for EC. This information could help institute the adoption of proactive safe sexual practices because it would be offered during a specific “teachable” moment in a women’s life.

Although sexual practices are similar between the two groups, which is consistent with the literature<sup>40,44,51,54-55</sup>, contraception practices and alcohol use appear to stand as primary modifiable indicators of those requesting EC. Preferably not only should those requesting EC be encouraged to adopt more protective behaviors, but all women visiting the WHC could benefit from this type of intervention, considering over half reported ever using EC.

## APPENDIX A

### Questionnaire

#### Contraception Practices Among UH Students

\*If you have previously completed this survey please DO NOT complete it again\*

#### Background

1. What is your age? \_\_\_\_\_
2. What race or ethnic group do you best identify with?  
 Caucasian/White       Hispanic       Pacific Islander- Not Hawaiian  
 Chinese       Japanese       American Indian or Alaskan Native  
 Filipino       Korean       Hawaiian/Part Hawaiian  
 Black or African-American       Other:(please specify) \_\_\_\_\_
3. What is your reason for this visit (mark ALL that apply)?  
 Renew/Start birth control pills       Request Emergency Contraception  
 Routine annual exam (PAP)       STD check  
 Other:(please specify) \_\_\_\_\_

#### Contraception

4. What method did you or your partner use to prevent pregnancy the last time during intercourse? (Select all that apply)  
 Have not had vaginal penile intercourse       Norplant (implant)       Condoms  
 Diaphragm/Cervical cap/Sponge       Birth control pills       Spermicide (e.g. foam)  
 Nothing- Not trying to become pregnant       Depo Provera (shots)       Withdrawal  
 Nothing- trying to become pregnant       Fertility awareness  
 Other:(please specify) \_\_\_\_\_
5. Number of times in the **PAST SIX MONTHS** where vaginal penile penetration occurred without ANY protection? (please select best answer)  
 Pregnant or trying       Never did this       Not in last 6 months       1-5       6-10       11-15  
 16-20       21-25       26+

#### Emergency Contraception

6. Have you **EVER USED** Emergency Contraception?  
 Yes       No

\*\*\*If you answered No please skip to question 7\*\*\*

6a. **IF YES:** number of times used in the **PAST YEAR?** \_\_\_\_\_

7. In the **PAST SIX MONTHS** have you had sex and after thought you might be at risk of becoming pregnant?  
 Yes (Wanted to become pregnant)       No  
 Yes (Did NOT want to be pregnant)

\*\*\*If you answered No or Yes (Wanted to become pregnant) please skip to question 8\*\*\*

7a. **IF YES (Did NOT want to be pregnant):** Did you  
 Use Emergency Contraception     Other: \_\_\_\_\_  
 Decided to "wait and see"

7b. **IF YES (Did NOT want to be pregnant):** Reason for "thinking" you might be pregnant  
 (mark all that apply):

- Condom slipped off
- Other birth control failure
- Unprotected sex- "got carried away"
- Used protection but being cautious
- Unprotected sex- Unwanted sexual contact
- Unprotected sex- Other:(please specify) \_\_\_\_\_
- Condom broke
- Missed a pill
- Inconsistent birth control use
- Cannot remember the night before

8. For Emergency Contraception to be effective it must be taken how soon after sex:  
 24 hours     72 hours     48 hours     96 hours     120 hours  
 within one week     Don't know     Sometime before next expected period

9. Once taken, Emergency Contraception reduces your risk of pregnancy by?  
 15%     35%     55%     75%     95%  
 25%     45%     65%     85%     100%

10. How did you learn about Emergency Contraception (mark all that apply)?  
 Never learned about it     Internet     College class     T.V.  
 High School class     Parents     Medical Professional     Pamphlets  
 Friend     Siblings     Other Professional  
 Other:(please specify) \_\_\_\_\_

11. How likely are you to use Emergency Contraception in the next three months?  
 Extremely Unlikely     Unlikely     Neither Likely or Unlikely  
 Extremely Likely     Likely

### Sexual Activity

12. How old were you when you **FIRST** had vaginal penile intercourse?  
 Never done this     <=14     15     16     17     18     19     20     21  
 22     23     24     25     26+

13. Within the **LAST YEAR**, with how many partners, if any, have you had sex (oral, vaginal, or anal)?  
 \_\_\_\_\_

14. Within the **LAST YEAR**, have you unintentionally become pregnant?  
 Yes     No

15. Within the **LAST SIX MONTHS**, how many times did you have (please select the best answer for each of the following):

- |                         |                                      |  |                             |                            |
|-------------------------|--------------------------------------|--|-----------------------------|----------------------------|
| a. Oral Sex?            | <input type="radio"/> Never did this | <input type="radio"/> Not in last 6 months | <input type="radio"/> 1-5   | <input type="radio"/> 6-10 |
|                         | <input type="radio"/> 11-15          | <input type="radio"/> 16-20                | <input type="radio"/> 21-25 | <input type="radio"/> 26+  |
| b. Vaginal Intercourse? | <input type="radio"/> Never did this | <input type="radio"/> Not in last 6 months | <input type="radio"/> 1-5   | <input type="radio"/> 6-10 |
|                         | <input type="radio"/> 11-15          | <input type="radio"/> 16-20                | <input type="radio"/> 21-25 | <input type="radio"/> 26+  |
| c. Anal Intercourse?    | <input type="radio"/> Never did this | <input type="radio"/> Not in last 6 months | <input type="radio"/> 1-5   | <input type="radio"/> 6-10 |
|                         | <input type="radio"/> 11-15          | <input type="radio"/> 16-20                | <input type="radio"/> 21-25 | <input type="radio"/> 26+  |

16. Please indicate the number of times you have experienced each of the following (if zero please put zero in blank provided):

\_\_\_\_\_ Pregnancies                      \_\_\_\_\_ Miscarriages  
\_\_\_\_\_ Births                                      \_\_\_\_\_ Abortions

17. How would you describe your most recent sexual partner?

- Have not had sexual intercourse
- Long-Term exclusive partner (>3 Months)
- New exclusive relationship (< 3 Months)
- Other:(please specify) \_\_\_\_\_
- Unknown (did not know last partner)
- Co-worker
- Casual (Friends)
- Regular but not exclusive partner
- Casual (New Acquaintance)

18. How long have you known your MOST RECENT sexual partner with whom vaginal penile penetration occurred?

- Have not had vaginal penile sex
- Less than 1 day
- Less than 1 week
- Less than 1 month
- Less than 1 year
- 1 Year or greater
- Did not know

### Sexually Transmitted Disease

19. Have you ever tested positive for a sexually transmitted disease?

- Yes  No

\*\*\*If you answered No please skip to question 20\*\*\*

19a. **IF YES:** Have you been tested for a sexually transmitted disease in the past year?

- Yes  No

### Alcohol/Drug Use

1 Drink=	1 Beer or Wine Cooler (12 ounces)
	1 Glass of Wine (4 ounces)
	1 Shot of Liquor (1 ¼ ounces)
	1 Mixed Drink

20. Are you currently?

- A consistent drinker of alcohol (2 or more times per week)
- A frequent drinker of alcohol (4 to 6 times per month)
- A regular drinker of alcohol (1 to 3 times per month)
- An occasional drinker of alcohol (at least once in the past year)
- An infrequent drinker of alcohol (drink, but not in the past year)
- A former drinker of alcohol, now a non-drinker
- A lifelong non-drinker of alcohol

21. How many drinks did you have before your last vaginal penile sexual experience?

- Never done this
- 1-3
- 4-6
- 7-9
- 10-12
- 13-15
- 16+
- None
- Don't remember

22. During your last sexual experience did you use: (mark all that apply)
- |   |   |                               |
|---|---|-------------------------------|
| <input type="checkbox"/> Marijuana (hash or hash oil) | <input type="checkbox"/> Heroin (injected or smoked, smack) | <input type="checkbox"/> None |
| <input type="checkbox"/> Inhalants (glue, solvents)   | <input type="checkbox"/> Designer drugs (ecstasy, MDMA)     |                               |
| <input type="checkbox"/> Hallucinogens (LSD, PCP)     | <input type="checkbox"/> Cocaine (crack, rock, powder)      |                               |
| <input type="checkbox"/> Methamphetamines (ICE...)    | <input type="checkbox"/> Other:(please specify)_____        |                               |

### Demographics

23. What is your current college status?
- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Not currently a student            | <input type="checkbox"/> 1 <sup>st</sup> year undergraduate | <input type="checkbox"/> 2 <sup>nd</sup> year undergraduate |
| <input type="checkbox"/> 3 <sup>rd</sup> year undergraduate | <input type="checkbox"/> 4 <sup>th</sup> year undergraduate | <input type="checkbox"/> 5 <sup>th</sup> year undergraduate |
| <input type="checkbox"/> Graduate                           | <input type="checkbox"/> Other:(please specify)_____        |   |
24. What is your height (feet and inches)? \_\_\_\_\_ ' \_\_\_\_\_ "
25. What is your weight (pounds)? \_\_\_\_\_ lbs
26. During the **PAST 30 DAYS** have you felt satisfied with your body image/size: (please circle only one)
- |        |            |           |       |
|--------|------------|-----------|-------|
| Always | Most times | Sometimes | Never |
|--------|------------|-----------|-------|
27. How do you describe your weight?
- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Very Underweight     | <input type="checkbox"/> About the right weight | <input type="checkbox"/> Very overweight |
| <input type="checkbox"/> Slightly underweight | <input type="checkbox"/> Slightly overweight    |  |

**You have completed the UH Contraceptive Practices Survey.  
Please place the completed survey in the locked deposit box provided.  
Mahalo for your participation!**

## APPENDIX B

### Consent Form

Agreement to Participate In Contraception Use Study  
Principal Investigator: Jared Parrish, Public Health Graduate Student,  
Phone: (808) 942-5594  
Department of Public Health Sciences and Epidemiology,  
University of Hawaii Mānoa  
Biomedical Sciences Bldg. Room D204

**Description:** This research project is being conducted as a component of a thesis for a master degree in public health. The purpose of the project is to investigate the use of contraception among university students and to better understand when students are likely to obtain contraception.

**Procedures:** You are eligible to participate in this study if you are a female, a U.H. Mānoa student, and at least 18 years old. If you choose to participate in the research, you will be asked to fill out an anonymous questionnaire while you wait to be seen for your appointment. Questions will cover your sexual history and present sexual practices, contraception use, substance use, and knowledge and practices regarding emergency contraception. The questionnaire should take no longer than 10 minutes. No identifying information will be requested and you are asked not to put your name on the survey. Once you have completed the survey please place only the survey into the locked deposit box provided by the clinic, and take this consent form with you. The box will be emptied the morning of the next business day by the principal investigator. The clinic personnel will not have access to your survey.

**Risks and Benefits:** There are no physical risks associated with participation in this study. Some of the questions could cause you to feel mildly embarrassed or uncomfortable. Participation in this research may be of no direct benefit to you, but the information gained from this study could help us to better understand factors related to contraceptive usage among college students so that we can improve our services and help educate students.

**Confidentiality/Anonymity:** This survey is anonymous. No identifying information will be asked on the questionnaire. The principal investigator has no access to clinic records or appointments of those who visit the clinic. There will be no way to link you to the answers given on the survey. Please do not put your name or any other identifying information on the survey.

**Voluntary Participation:** Your participation in this survey is completely voluntary. You may choose to answer none, some, many or all of the questions. Your decision to participate or not will not affect your access to services at the clinic. Consent to participate in this study will be given by depositing the anonymous survey in the locked deposit box.

**Results of the Study:** If you would like to learn about the study results, please contact Jared Parrish, at the address/ phone number given above. Final results of this study will be available sometime in June 2006 and presented in a thesis paper and oral defense.

If you have any questions regarding this research project, please contact the researcher Jared Parrish, at (808) 942-5594.

If you have any questions regarding your rights as a research participant, or if you cannot obtain satisfactory answers to your questions or have comments or complaints about your treatment in this study, please contact the UH Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Phone: (808) 956-5007.

**Mahalo for your participation**

**\*Please do not return this form, this is your copy\***



## APPENDIX C

### Answers to Knowledge Questions

**Frequency Distribution of the Responses to the Both Knowledge Questions Asked About Emergency Contraception.**

	N 308	Requesting EC	
		Yes N = 54	No N = 254
	no.(%)		
<b>Effectiveness*</b>			
15%	2 (0.6)	0	2 (0.8)
45%	1 (0.3)	0	1 (0.4)
55%	13 (4.2)	0	13 (5.1)
65%	6 (1.9)	3 (5.6)	3 (1.2)
75%	46 (14.9)	5 (9.3)	41 (16.1)
85%	99 (32.1)	22 (40.7)	77 (30.3)
95%	114 (37.0)	21 (38.9)	93 (36.6)
100%	11 (3.6)	2 (3.7)	9 (3.5)
Unknown	16 (5.2)	1 (1.9)	15 (5.9)
<b>Time To Take By**</b>			
24 hours	36 (11.7)	2 (3.7)	34 (13.4)
48 hours	27 (8.8)	3 (5.6)	24 (9.4)
72 hours	221 (71.8)	49 (90.7)	172 (67.7)
96 hours	5 (1.6)	0	5 (2.0)
120 hours	4 (1.3)	0	4 (1.6)
Within one week	1 (0.3)	0	1 (0.4)
Before next expected period	1 (0.3)	0	1 (0.4)
Don't know	13 (4.2)	0	13 (5.1)

\*Wording of actual question: Once taken, Emergency Contraception reduces your risk of pregnancy by?

\*\*Wording of actual question: For Emergency Contraception to be effective it must be taken how soon after sex?

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