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Knowledge, attitudes, and behaviors related to emergency contraception among college students

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Knowledge, Attitudes, and Behaviors Related to
Emergency Contraception Among College Students

A Project Presented to

the Faculty of the

College of Health and Behavioral Studies

James Madison University

in Partial Fulfillment of the Requirements

for the Degree of Bachelor of Science

by Sarah K. Donohue

May 2015

Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Degree of Bachelor of Health Science.

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Abstract

More than 50% of pregnancies in the United States are unplanned. Though recent regulations have expanded access to EC, the numerous policy changes, lack of knowledge, and unreliable sources of information regarding EC prevent women from utilizing the benefits that EC can offer.

The purpose of this study was to assess students' knowledge and attitudes about emergency contraception (EC) and to determine if there is a relationship between sexual behaviors and the use of EC. Two hundred and twelve undergraduate students from James Madison University completed an anonymous 29-question survey regarding EC.

Results indicated that students were reasonably knowledgeable regarding the purpose and use of EC, with the majority of respondents answering eight out of ten questions correctly. A chi-square analysis was conducted to evaluate the association between gender and attitudes towards EC. Data showed a significant relationship between gender and attitude about (1) whether the advanced provision of EC contributes to increased risky sexual behavior and (2) whether the use of EC is the females decision only. Regarding types of risky sexual behaviors, four behaviors were evaluated: sex under the influence of alcohol and/or drugs, age of first sexual intercourse, number of sexual partners within the past year, and frequency of use of protection with sexual partner. Overall, of those respondents who were sexually active, majority engaged in few risky sexual behaviors and appeared to participate in safe sexual practices (having few sexual partners and frequent use of protection).

Chapter I

Introduction

Unintended pregnancy continues to be a major health issue for sexually active women. According to Corbett et al. (2006), while a majority of women do use a regular form of birth control, approximately 50% of all pregnancies are unplanned. Participation in risky sexual behaviors, such as having sexual intercourse under the influence of alcohol, having multiple partners, or refraining from the use of contraception contribute to this confounding statistic. Emergency contraceptive pills (ECPs) are an effective way to reduce unplanned pregnancies after method failure or risky sexual behavior.

ECPs offer a woman reassurance after having unprotected sex. Emergency contraception available in the United States includes hormonal ECPs and nonhormonal IUD insertions. Nonetheless, the impact of making EC available over the counter has raised many questions about whether its easy access would increase risky behavior among young adults. This study is designed to determine whether the use of EC is associated with sexual risk-taking among college-aged students.

Significance of the Study

This research is necessary to determine what instruction, if any, is needed to educate students on the latest regulations regarding ECPs, along with any additional knowledge and information that would further inform students. For this study in particular, James Madison University Students will largely benefit, along with health science professors and other health-related community members.

Statement of the Problem

A gap in current research exists among the relationship between knowledge, attitudes, and participation in risky sexual behaviors and the use of ECPs among university students, primarily since its FDA approval as an over-the-counter (OTC) medication in 2013.

Before approval in 2013, emergency contraception was limited as an OTC medication for women 17 years and older, and as a prescription only medication for females under the age of 17 (FDA, 2013). Moreover, the number of regulations that have transpired since the introduction of ECPs has led to confusion among physicians, pharmacists, and the general public.

Research Questions

The following research questions were addressed in this study:

1. Are students familiar with EC and its availability and mechanism of action?
2. What common risky sexual behaviors do undergraduate students participate in?
3. Is the use of emergency contraception common among this population?
4. What are reasons for students' use of emergency contraception?
5. What relationship exists, if any, between gender and attitudes related to EC?

Limitations of the Study

This study was exploratory and some surveys were incomplete and produced missing data. Surveys were self-reported and answers reported may be limited due to memory, sensitivity of the subject matter, or the need to give socially desirable answers. The small sample size (212 participants), use of a convenience sample, and having a disproportionate female to male ratio may limit generalizability of results. The results may

not reflect college students or the student body at James Madison University. The timing of when the survey was administered may have also had an effect on the accuracy of responses. While most surveys were administered in a class setting where time was not rushed, a third of the surveys were administered during dinnertime in an area located near a dining hall. Respondents may have felt rushed to complete the survey, causing errors in answer selection.

Lastly, a majority (n=141; 66.5%) of surveys were administered in 300-level health science classes. This explains why most of the participants were either juniors or seniors and why most were health sciences majors. The responses may be limited in any generalizability to non-health sciences majors or students who are not juniors or seniors.

Definition of Terms

- *Emergency contraception* is birth control that prevents pregnancy after unprotected or risky sex, and includes emergency contraceptive pills or ParaGard IUD insertion (Association of Reproductive Health Professionals [ARHP], 2014).
- *Emergency contraceptive pills* are hormonal birth control pills used to prevent pregnancy for up to five days after unprotected sex, and is sometimes referred to as the “morning after pill” (Association of Reproductive Health Professionals [ARHP], 2014).
- *IUD*, or intrauterine device, is a small T-shaped device inserted into the uterus to prevent pregnancy (Planned Parenthood, n.d.).
- The *endometrial lining* is the inner most tissue of the uterus that changes in width during a woman’s cycle to create an optimal environment for implantation of a fertilized egg.

- The *cervix* is a cylindrical-shaped body of tissue that connects the vagina to the uterus (WebMD, 2012).
- *Nonhormonal* refers to methods of emergency contraception that do not contain any hormones to prevent pregnancy.
- *Ovulation* is the release of an egg from the ovaries and its travel along the fallopian tube and into the uterus.
- *RU-486*, also called Mifepristone, is an abortion pill used to terminate an already existing pregnancy.

Chapter II

Review of Literature

The purpose of this chapter is to investigate the literature on the use of ECPs and risky sexual behaviors related to the research questions of this study. The following areas will be reviewed: History of EC, Societal and Political Controversy over EC, Provision and Access of EC, Pharmacist Refusal Laws, Types of EC and Mechanism of Action, Knowledge and Attitudes toward EC, and Sexual Risk-Taking.

History of Emergency Contraception

EC is often referred to as the “morning after pill,” but it can be either hormonal pills or insertion of an intrauterine device (IUD) that is utilized after having unprotected intercourse or in the event of contraceptive failure (Corbett, 2006). The emergency contraceptive pill (ECP) is composed of varying amounts of hormones and is easily swallowed, while the copper-releasing IUD must be inserted into the uterus by a skilled physician (Corbett, 2006). ECPs had a long history of trial and error but eventually made it to U.S. shelves in 1998. After its debut, a cascade of alternative FDA-approved EC methods became available for women.

ECPs date back to the early 1920s, when researchers first discovered that estrogenic ovarian extracts hindered mammalian pregnancy (Ellertson, 1996). The first use of estrogen as a type of EC was given to horses and dogs that had mated against their owner’s wishes. It was not until the 1960’s in the Netherlands that the first human, a 13-year-old girl who had been raped during mid-cycle, was successfully given a high dose of estrogen to prevent pregnancy (Ellertson, 1996). After years of solely using large amounts of estrogen, Canadian physician Albert Yuzpe and his colleagues introduced a pill that contained both

estrogen and progestin, which showed to inhibit ovulation before it occurred (Ellertson, 1996). Shortly after in the late 1970s, the primary nonhormonal method of EC was introduced. Clinicians primarily thought that the copper T IUD acted as an embryotoxin by releasing copper ions, but was found to also inhibit or delay ovulation (Ellertson, 1996).

In 1997, the Food & Drug Administration (FDA) announced that there were six brands of effective emergency contraceptive pills (ECPs), but were not available in the U.S. due to fears from manufacturers about litigation and political dispute (CNN Interactive, 1998). Shortly after, the first FDA approved ECP product hit the U.S. market in 1998 (Contraceptive Technology Update, 1998). The FDA approved the Preven Emergency Contraceptive Kit, which was available to all women by prescription only. The kit was cost efficient, priced at about \$20, and comprised of a pregnancy test, instructional guide, and four blue pills (Contraceptive Technology Update, 1998). The pills contained a mixture of 0.05 mg ethinyl estradiol and 0.25 mg levonorgestrel. The first two pills were taken within 72 hours after unprotected sex and the second two pills were taken the following 12 hours (Contraceptive Technology Update, 1998). The appearance of the Preven EC Kit initiated the availability of various other hormonal and nonhormonal methods in the ensuing years.

Types of Emergency Contraception and Mechanism of Action

Hormonal ECPs

There are three types of ECPs available: ECPs containing both progestin and estrogen, ECPs containing progestin-only, and ECPs containing ulipristal acetate (UPA) (Dominguez, *et. al.*, 2011). The progestin-only pills replaced the popular progestin and estrogen combination pill because they proved to be more effective and caused less severe

side effects in women (Dominguez, *et. al.*, 2011). Oral contraceptives approved for use as an ECP include Plan B One-Step, Next Choice, and the latest, ella.

Nonhormonal Copper T IUD

The Copper T IUD is most commonly used as a hormone-free method of birth control that is effective for up to 10 years. However, women who are sensitive to large doses of hormones and have had unprotected sex may use this method as a form of EC. The Copper T IUD is inserted six to 12 days after ovulation in order to prevent pregnancy (Dominguez, *et. al.*, 2011). The only known nonhormonal IUD approved for use as an EC in the United States is ParaGard.

The two types of EC act in different ways to prevent a pregnancy from happening. ECPs work by releasing a large dose of hormones, either all at once by taking one pill (i.e. Plan B, One-Step, or ella) or across a 24-hour time span by taking one pill first and then a second pill 12 hours later (i.e. Next Choice) (Trussell, Raymond, & Cleland, 2014). Multiple clinical trials have shown that the hormones released act by preventing or delaying ovulation. Additional studies have found the thickening of the endometrial lining and the congealing of the cervical mucous, which traps the sperm and prevents it from reaching the egg (Trussell, Raymond, & Cleland, 2014). ECPs are very effective for preventing pregnancy up to 72 hours after intercourse and are reasonably effective for up to five days post coitus (Dominguez, *et al.*, 2011).

Conversely, the Copper T IUD is a nonhormonal method that acts by releasing a steady amount of copper ions that prevent ovulation before it has occurred or delay the onset of ovulation. Since the origin of the Copper IUD in the late 1970s, only 10 known

failures have been reported, demonstrating only a 0.1% pregnancy rate (Trussell, Raymond, & Cleland, 2014).

Controversy over Emergency Contraception

Though emergency contraceptive pills (ECPs) have been around for some time, they are still a prominent topic of debate in our society. The cause of this debate may stem from a lack of knowledge on the use and mechanism of ECPs and conflicting views about contraception and abortion.

Advocates of ECPs believe that they will benefit society by reducing the number of unintended pregnancies and the number of women receiving abortions. In contrast, opponents believe that taking any type of morning after pill amounts to an abortion and that anything having the potential to prevent a pregnancy from occurring is considered an abortion method (Stacey, 2014).

Moreover, ECPs have been viewed synonymously with the RU-486 abortion pill. The abortion pill, also known as Mifepristone, causes the termination of an existing pregnancy, while ECPs merely prevent a pregnancy from occurring and do not harm an already established pregnancy (Stacey, 2014). As stated by the National Institute of Child Health and Human Development (NICHD), pregnancy is the event in which a sperm penetrates an egg to form a fetus (NICHD, 2013). More recent debate has focused on the labels that are found inside every box of ECPs that say ECPs may work by preventing a fertilized egg from implanting in the uterus (Belluck, 2012). However, some studies have not been able to definitively show that ECPs actually prevent implantation in the womb (Belluck, 2012).

Not only does the use of ECPs ignite debate in society, it has proved to be a key issue among political candidates as well. In the 2012 presidential election, republican Mitt Romney referred to emergency contraceptive pills (ECPs) as “abortive pills” (Belluck, 2012). However, it seemed that most of the debate surrounding ECPs was fueled by inaccurate or antiquated information. For instance, some conservative officials still believe that ECPs block an already fertilized egg from implanting in the uterus, when ECPs essentially block the fertilization of an egg (Belluck, 2012). Other political candidates, including Newt Gingrich and Rick Santorum, made similar assertions based on the erroneous knowledge that ECPs prevent fertilized eggs from implanting in the uterus (Belluck, 2012).

On the other hand, the Obama administration announced in 2013 that the FDA will comply with the court-ordered decision to make Plan B One-Step available over-the-counter without age or gender restrictions (Food & Drug Administration [FDA] News Release, 2013). The administration’s opinion to expand access to ECPs was intended to further decrease the rate of unplanned pregnancies among young and teen-aged women (FDA News Release, 2013).

Many emergency departments, in both Catholic hospitals (55%) and non-Catholic hospitals (42%), were found to not dispense ECPs to patients, even those who were raped or sexually assaulted (Dominguez, *et. al.*, 2011). Additionally, up until 2010, conservative members of Congress limited the provision of ECPs to Military Treatment Facilities and to American soldiers overseas, which raised concern after the reports of an increase in numbers of female soldiers being raped (Dominguez, *et. al.*, 2011). As a result, Next Choice (generic version of Plan B) was added to the Basic Core Formulary (list of medications that

must be required at the every full-time military base), necessitating that ECPs be fully stocked at all Military Treatment Facilities (Dominguez, *et. al.*, 2011).

Barriers to Emergency Contraception Access and Provision

The access to emergency contraceptive pills (ECPs) was made easier after the FDA under the Obama administration removed age and gender restrictions and approved Plan B One-Step as an over-the-counter (OTC) medication. Though this was a productive step in the realm of women's health, there continued to be limited access for women living in particular areas of the United States, specifically in rural, conservative, and low income areas. This is partly due to erroneous beliefs about the mechanism of ECPs in pregnancy prevention, along with price constraints for underprivileged women unable to afford the medication.

According to the article by Wilkinson et al. (2013, pg. 14), "I'll see what I can do': What adolescents experience when requesting emergency contraception," the numerous changes made to laws pertaining to the provision of EC has caused confusion among pharmacists and health care professionals (Wilkinson et al., 2013). In a study using females posing as 17-year-old adolescents, 943 pharmacies from five major U.S. cities (Austin, Texas; Cleveland, Ohio; Nashville, Tennessee; Philadelphia, Pennsylvania; and Portland, Oregon) were called and questioned using a standardized script. Researchers found that the females were given false answers regarding access to ECPs and subjective answers using personal or religious opinions to explain EC or to refuse provision (Wilkinson et al., 2013). While the relationship between location of the pharmacy and types of answers was not studied, this investigation highlighted the need for pharmacy employee education and frequent updates to pharmacists on changes to dispensing laws.

In addition, according to the Emergency Contraception Access and Education Act, S.2876, 113th Cong. (2014) introduced by Senator Murray (D-WA), only 13 states and the District of Columbia are required to provide EC in hospital emergency rooms upon request by victims of sexual assault. Six states (Arizona, Arkansas, Georgia, Idaho, Mississippi, and South Dakota) have laws that allow hospital physicians to refuse the provision of emergency contraception, regardless of being a survivor of sexual assault (Pharmacist Conscience Clauses, 2012).

Pharmacist Refusal Laws

The Supreme Court case, *Roe v. Wade*, introduced the approval of health care provider “refusal clauses,” also known as “conscience clauses,” which allowed physicians and hospitals to refuse to perform or assist in abortions (Pharmacist Conscience Clauses, 2012). Recently, this law was expanded to grant pharmacists the ability to refuse to dispense ECPs based on ethical or religious values. In particular, Arizona, Arkansas, Georgia, Idaho, Mississippi, and South Dakota passed laws allowing pharmacists to refuse to supply ECPs based on moral grounds (Pharmacist Conscience Clauses, 2012). Other states include a medley of these legislations stating that physicians and pharmacists may not be held liable for refusing to dispense contraception or any type of family planning information (Pharmacist Conscience Clauses, 2012).

According to the National Women’s Law Center, in January of 2010 a woman went to her local CVS to purchase ECPs after she and her fiancé experienced method failure. The pharmacist refused to dispense the ECPs to her, even though it was in stock, and told her to come back in two and a half days, at which the medication would then be ineffective (Pharmacy Refusals 101, 2012). These parameters have limited the ready access to ECPs

for women, especially for those living in more conservative regions. Nonetheless, states such as New Jersey have actually enacted laws that prohibit any pharmacist from refusing to fill a prescription based on moral theory (Pharmacist Conscience Clauses, 2012).

University Students' Knowledge and Attitudes Toward Emergency Contraception

Plan B One-Step was first approved in 2009 for women aged 17 and older and available as a prescription-only medication. Since then, the Food & Drug Administration (FDA) has approved Plan B for all women of reproductive age without a prescription (Food & Drug Administration [FDA] News Release, 2013). Despite the recent accessibility of EC, studies show that there is still little knowledge or opinion on EC by college students.

According to a survey conducted by Miller, while 60% of students believed that EC should be available without a prescription, only 50% reported that they would feel comfortable using it (Miller, 2011). Post hoc examination for reasons behind these results show that students who said they would feel comfortable using EC had most likely heard of it before, taken health classes on contraception, or had increased knowledge on the use of EC (Miller, 2011). These findings indicate that having a higher knowledge and familiarity of EC may be related to more accepting attitudes towards using EC.

In addition, an investigation into the attitudes and beliefs about EC by a team of registered nurses found that 67% of the college students reflected that unintended pregnancies were a major issue in the United States (Corbett et al., 2006). Of students surveyed, 68% reported that they had no moral or religious objections to using EC, however 29.9% of those respondents said that they would feel uncomfortable asking for it (Corbett et al., 2006). The women who responded that they would most likely not use EC

indicated that they would feel embarrassed or judged when asking for it (Corbett et al., 2006).

The study by Corbett et al., (2006) also examined knowledge and attitudes about ECPs among college students, along with their attitudes towards it. Most students (96%) had previously heard of ECPs, or the “morning after pill.” In addition, 71% knew what ECPs were and agreed that they were used to prevent pregnancy (Corbett et al., 2006). However, 87.6% of the participants were unable to distinguish between the morning after pill and the RU-486 abortion pill. Although many students were aware of what ECPs are and what they do, most had misconceptions about the difference between ECPs and mifepristone.

A second major knowledge deficit was students’ lack of knowledge about how to obtain ECPs. Miller (2011) reported that of those who were surveyed, only 16% knew that they could obtain ECPs from their university health center, while 60% responded that they would not know where to purchase it off campus (Downing, 2014). The study also found that almost 75% of students were not aware that they could purchase ECPs over-the-counter (Downing, 2014).

Sexual Risk-Taking

Sexual risk-taking is defined as the involvement in any sexual activity that increases a person’s predisposition for an unplanned pregnancy and/or a contraction of a sexually transmitted infection (STI) (Weiss et al., 2008). Behaviors include unprotected sex, sex with multiple partners, sex under the influence of drugs or alcohol, or inconsistent use of contraception (Weiss et al., 2008).

According to the Bixby Center for Global Reproductive Health (2008), changes in availability of ECPs will not lead to an increase in sexual risk-taking, despite what some

health officials and political candidates believe (Weiss et al., 2008). Using simulation studies to show the effects of over-the-counter provision of EC and increased access, studies have found that women have not abandoned their regular method of contraception, nor did they increase their number of partners when receiving advanced provision of EC (Weiss et al., 2008). Also, a study conducted with 825 sexually active women found that 56% females with multiple provisions of ECPs provided by a health care professional never engaged in unprotected sex, while 3% engaged in frequent unprotected sex (Weiss et al., 2008).

Weiss et al. (2008) found that increased access to ECPs does not promote sexual risk-taking among young adults. An investigation of 826 15-24-year-old females discovered that compared with other females, those with advanced provision of ECPs by their health care provider engaged in sex with one partner (75.2%). Also, only 2.3% and 4.4% were positive for chlamydia and herpes, respectively (Weiss *et. al.*, 2008).

Furthermore, a study conducted by Raine et al. (2005) in which women were assigned to one of three groups: pharmacy access to EC, advanced provision of EC, and clinical access to EC (control) found that women who had pharmacy access to ECPs used the method the same amount as with the control group. Women who had advanced provision of ECP (three packages) were twice as likely to use EC compared to the control group, even though both groups had similar frequencies of unprotected sex (Raine et al., 2005). Similarly, Harper et al. (2000) conducted a randomized controlled study with 370 women in which one group was given four packages of ECPs and a five-minute education session, while the other group was given no advanced provision. The study found that those women provided with ECPs were four times more likely to use the pills than those

with no advanced provision (Jackson et al., 2003). However, the study found that there was no evidence of less effective use of regular contraception among those with ready access to ECPs (Jackson et al., 2003).

Chapter Summary

This chapter reviewed the history of EC, societal controversy over EC, political controversy over EC, provision and access of EC, pharmacist refusal laws, types of EC, mechanism of action, attitudes toward EC, knowledge of EC, and sexual risk-taking. The many changes in laws regarding ECPs has led to confusion among health professionals and the general population about its procurement and availability. Though recent regulations have expanded access to EC, lack of knowledge and unreliable sources of information concerning EC prevent women from utilizing the benefits that EC can offer if placed in an unfavorable post-coital situation.

Chapter III

Methodology

The purpose of this research was to assess students' knowledge and attitudes about EC and to determine if there is a relationship between risky sexual behaviors and the use of EC. The data collected from this study allowed the researcher to identify the knowledge level of university students on EC, their attitudes regarding EC, and any correlations between students' sexual behavior and their use of EC. The results of this research may provide valuable information for health professors and may illustrate the need to incorporate additional information on the use and availability of EC to students in general health classes.

Sampling

The sample population used in this study was James Madison University undergraduate students. Participants constituted a variety of majors and included both male and female students ranging from the ages of 18 to 22. Students from three health science classes and students who attended the Festival dining facility on 11/5/14 participated in the study. The survey was administered after approval from the Institutional Review Board.

Instrumentation

A survey was developed to determine the possible relationship between risky sexual behavior and emergency contraceptive (EC) use and the level of knowledge and attitudes among James Madison University students. The survey comprised a total of 32 questions, consisting of 3 demographic questions, 10 knowledge-based questions, seven attitudinal-based questions, and 12 multiple-choice questions. The demographic questions

measured gender, year in college, and type of major (either health science or non-health science). The 10 knowledge questions involved dichotomous true or false questions to measure the students' perceived information and understanding of emergency contraceptive pills (ECPs). The seven attitudinal questions used a three-point Likert scale (1= agree, 2= disagree, and 3= no opinion) to measure the students' perspective and stance on ECPs. Lastly, 12 multiple-choice questions measured students' sexual activity, age of first time having intercourse, number of sexual partners within the past year, type of protection used during intercourse, types of sexual behavior, and use of ECPs. A copy of the survey is found in Appendix A.

Procedures

Institutional Review Board approval was received on 10/28/14. Research for this study began on 11/4/14 and ended on 11/6/14. The survey was administered at James Madison University, specifically in classes with permission from the instructor and in the Festival dining facility. A cover letter that accompanied the survey is found in Appendix B. The surveys were handed out to each student and the instructions were lucidly communicated before the participants started the survey. Upon completion, the surveys were placed in a large envelope and the envelope was then sealed and stored in a locked file inaccessible to anyone except the researcher.

Research Design

A sample of 212 James Madison University students participated in this study. The subjects received no incentive for their voluntary participation and all surveys were anonymous.

Research Questions

The following research questions were addressed in this study:

1. Are students familiar with EC and its availability and mechanism of action?
2. What common risky sexual behaviors do undergraduate students participate in?
3. Is the use of emergency contraception common among this population?
4. What are reasons for students' use of emergency contraception?
5. What relationship exists, if any, between gender and attitudes related to EC?

Data Analysis

Data were aggregated and analyzed using SPSS computer software program.

Demographic questions, attitudinal questions, and multiple choice were all evaluated using descriptive frequency and means. The relationship between gender and attitudes related to EC were analyzed using a nonparametric chi-square analysis.

Chapter IV

Results

This chapter reports the results from the survey responses. The following five research questions are addressed in the results:

1. Are students familiar with EC and its availability and mechanism of action?
2. What common risky sexual behaviors do undergraduate students participate in?
3. Is the use of emergency contraception common among this population?
4. What are reasons for students' use of emergency contraception?
5. What relationship exists, if any, between gender and attitudes related to EC?

Description of Sample

A total of 212 undergraduate students from James Madison University were anonymously surveyed. All 212 students completed the "Knowledge, Attitudes, and Behaviors Related to EC Among College Students" survey and any questions left unanswered were presented as missing data.

Table 1 illustrates the descriptive statistics for the 212 respondents. The respondents consisted of 151 females (71.2%) and 61 males (28.8%). The respondents consisted of 10 freshman (4.7%), 26 sophomores (12.3%), 100 juniors (47.2%), and 76 seniors (35.8%). Students were categorized as either a health sciences major (n=141; 66.5%) or a non-health sciences major (n=71; 33.5%).

Table 1. Demographics of Subjects

	n	%
Gender		
Male	61	28.8
Female	151	71.2
Total	212	100.0
Year		
Freshman	10	4.7
Sophomore	26	12.3
Junior	100	47.2
Senior	76	35.8
Total	212	100.0
Major		
Health Sciences	141	66.5
Non-health Sciences	71	33.5
Total	212	100.0

Description of Knowledge on Emergency Contraception

The survey contained 10 true/false questions to assess students' knowledge of pregnancy and emergency contraception (Table 2). Based on respondents' answers, a majority of students answered eight out of the ten questions correctly while there were only two questions that most of the population did not know. In terms of evaluating knowledge on common misconceptions concerning emergency contraception, only 9.5% of students knew that taking three hormonal birth control pills was equivalent to one emergency contraceptive pill. When asked if emergency contraception can be purchased over-the-counter to any age and whether it can be purchased by a male, only 25.0% answered correctly.

Regarding pregnancy, 94.8% of students knew that a woman can get pregnant the first time she has intercourse. Similarly, 74.4% of students knew that pregnancy is most likely to occur during a female's mid-cycle. On the other hand, most students (n=203; 95.8%) were aware that emergency contraception cannot be taken as a monthly birth control pill. Moreover, when asked whether emergency contraception can only be taken the morning after unprotected sex, 77.8% answered correctly. Majority of students (n=193; 91.0%) were also aware that emergency contraception is different from the abortion pill. When asked if emergency contraception can be purchased by a male, 93.9% answered correctly. In addition, 83.5% of students knew that the emergency contraception pill can be taken more than three times in a woman's life and 87.3% knew that emergency contraception can be taken up to 72 hours after unprotected sex.

Table 2. Knowledge of Subjects

	T		F	
	n	%	n	%
A woman cannot get pregnant the first time she has intercourse	11	5.2	201	94.8
Pregnancy is most likely to occur during a female's mid-cycle	158	74.4	54	25.6
Taking 3 hormonal birth control pills is equivalent to 1 emergency contraceptive pill	201	91.1	91	9.5
Emergency contraception can be used as a monthly birth control pill	9	4.2	203	95.8
Emergency contraception can only be taken the morning after unprotected sex	47	22.2	165	77.8
Emergency contraception is the same as the abortion pill	19	9.0	193	91.0
Emergency contraception is available over the counter to any age	53	25.0	159	75.0
Emergency contraception can be taken up to 72 hours after intercourse	185	87.3	27	12.7
Emergency contraception can be taken no more than 3 times in a woman's life	35	16.5	177	83.5
Emergency contraception cannot be purchased by a male	13	6.1	199	93.9

Description of Attitudes Related to Emergency Contraception

Participants were asked seven questions to determine their attitudes related to emergency contraception (Table 3). When asked if women should have an advanced provision of emergency contraception, most subjects disagreed with this statement (n=100; 47.2%). Furthermore, 67.0% of subjects disagreed when asked if they would be more likely to participate in risky sexual behavior if they had EC on hand. Additionally,

68.4% of students did not believe that men should buy emergency contraception ahead of time for their partner. A large percentage of participants (n=199; 93.9%) disagreed with “it is okay to not use protection because EC is readily available.” In addition, 67.5% of students said that EC is not common among their friends or their partners. When asked if the use of EC was the female’s decision only, only 24.1% agreed while 67.5% disagreed. Lastly, majority of students said that they do not repeatedly use EC after having unprotected sex (n=178; 84.0%) while 14.1% had no opinion and only 1.9% agreed with this statement.

Table 3. Description of Attitudes Related to Emergency Contraception

	Agree		Disagree		No opinion	
	n	%	n	%	n	%
Women should have ECPs on hand	43	20.3	100	47.2	69	32.5
If I have ECPs on hand, I am more likely to participate in risky sexual behavior	47	22.2	142	67.0	23	10.8
Men should buy EC ahead of time for their partner	22	10.4	145	68.4	45	21.2
It is okay to not use protection because EC is readily available	2	0.9	199	93.9	11	5.2
The use of EC is common among my friends or their partners	61	28.8	123	58.0	28	13.2
The use of EC is the female’s decision only	51	24.1	143	67.5	18	8.5
I repeatedly use EC after having unprotected sex	4	1.9	178	84.0	30	14.1

Description of Risky Behaviors

The purpose of this study was to assess the use of emergency contraception and types of risky sexual behaviors among James Madison University students. Of the participants, (n=72; 34.0%) reported they were currently in a monogamous relationship, while similar numbers of participants were either sporadically with one partner (n=33; 15.6%), sporadically with different partners (n=39; 18.3%), not sexually active within the past three months (n=35; 16.5%), or had never been sexually active (n=33; 15.6%).

Regarding types of risky sexual behaviors, four behaviors were evaluated: sex under the influence of alcohol and/or drugs, age of first sexual intercourse, number of sexual partners within the past year, and frequency of use of protection with sexual partner (Table 4). In terms of sex under the influence, the most participants (n=138; 65.2%) answered that they “occasionally have sex under the influence of alcohol and/or drugs.” In terms of the age at which the participants first had sex, of students (n=55; 26.2%) had sex at 16 or younger. The number of respondents in the 17 (n=41; 19.5%), 18 (n=38; 18.1%), and 19 or older (n=36; 17.1%) age groups were evenly dispersed and also fairly small.

Regarding the number of sexual partners, 100 respondents (47.6%) had only 1-2 partners within the past year. Furthermore, less than half of students (n=97; 46.4%) said that they use protection every time they have sex.

Table 4. Description of Risky Behaviors

	n	%
Sex under the influence of alcohol and/or drugs		
Every time I have sex I am under the influence	3	1.4
I occasionally have sex under the influence	138	65.2
I never have sex under the influence	31	14.3
I am not sexually active	40	19.0
Total	210^a	100.0
Age of first sexual intercourse		
16 or younger	55	26.2
17	41	19.5
18	38	18.1
19 or older	36	17.1
I have not had intercourse	40	19.0
Total	210^a	100.0
Number of sexual partners within the past year		
1-2	100	47.6
3-4	44	21.0
5-6	11	5.2
7 or more	11	5.2
I have not had intercourse	44	21.0
Total	210^a	100.0
Frequency of use of protection with sexual partner		
Every time	97	46.4
Never	18	8.6
Sometimes	55	26.3
I have not had intercourse	39	18.7
Total	209^b	100.0

^a Data missing from 2 subjects

^b Data missing from 3 subjects

Description of Use of Emergency Contraception

A majority of the participants (n=150; 71.6%) have never used emergency contraception, and 28.4% (n=60) responded that they have used EC (Table 5). Of those respondents who have used EC, the most common reason reported was “ineffective contraception—i.e. condom breakage” (n=17; 8.1%). Of those who have used EC, 17.9% (n=38) only took it once and only 13.2% (n=27) of students have taken it two or more

times. When asked who purchased the EC, 15.6% (n=33) of participants said that the female purchased it and only 6.6% (n=13) purchased it with their partner.

In terms of reasons for why those who have never taken emergency contraception, most said that “they have not needed it” (n=116; 55.2%). When asked if they would every use EC in the future, most agreed that they would (n=120; 56.6%), while only 11.8% (n=25) said that they would not.

Table 5. Description of Use of Emergency Contraception

	n	%
Have you or your partner ever used EC?		
Yes	60	28.4
No	150	71.6
Total	209^b	100.0
What was your primary reason for taking EC?		
Ineffective contraception—i.e. condom breakage	17	8.1
Unprotected Sex	13	6.2
Fear of method failure	3	1.4
Just to “play it safe”	7	3.3
Under the influence of alcohol and/or drugs	1	0.5
Chose more than one above response	29	13.8
Does not apply—I have not taken EC	140	66.7
Total	210^a	100.0
How many times have you taken EC?		
None	147	68.9
Once	38	17.9
Twice	20	9.4
Three or more times	7	3.8
Total	212	100.0
Who purchased the emergency contraception?		
Female	33	15.6
Male	20	9.4
I purchased it with my partner	13	6.6
Does not apply—I have not taken EC	142	68.4
Total	209^b	100.0
If you have never taken EC, why not?		
I have not needed it	116	55.2
Too afraid to purchase it	1	0.5
I could have used it, but I took my chances instead	7	3.3
Taking it is against my moral values	1	0.5
Chose more than one above response	7	3.3
Does not apply—I have not needed it	78	37.1
Total	210^a	100.0
Would you take emergency contraception in the future?		
Yes	120	56.6
No	25	11.8
Undecided	67	31.6
Total	212	100.0

^a Data missing from 2 subjects

^b Data missing from 3 subjects

Relationship between Gender and Attitudes on Emergency Contraception

A chi square analysis was used to measure the relationship, if any, between attitudes and gender (Table 6). A total of two attitudes were found to have significance. When assessing whether having ECPs on hand would contribute to more risky behavior, there was a significant difference between both genders at the 95% confidence level ($X^2= 12.480$, $df= 2$, $p= .002$). Similarly, there was a significant difference when asked if the use of EC is the female’s decision only ($X^2= 7.141$, $df= 2$, $p= .028$). In contrast, there was no significant difference between males and females when asked if women should have EC on hand or if “the use of EC is common among my friends and their partners.”

There were two questions “It is okay to not use protection because EC is readily available” and “ I repeatedly use EC after having unprotected sex,” that contained >25% of cells that did not meet the expected cell frequencies. Therefore, chi square analyses could not be computed for these questions.

Table 6. Relationship between gender and attitude towards emergency contraception

	X² (df=2)	p
Women should have ECPs on hand	1.571	.456
If I have ECPs on hand, I am more likely to participate in risky sexual behavior	12.480	.002*
Men should buy EC ahead of time for their partner	2.788	.248
It is okay to not use protection because EC is readily available	21.345**	
The use of EC is common among my friends or their partners	7.890	.019
The use of EC is the female’s decision only	7.141	.028*
I repeatedly use EC after having unprotected sex	20.373**	

* Indicates significance at $p < 0.05$

**Indicates the X^2 variables did not meet expected frequencies

Chapter V

Discussion

Introduction

The purpose of this chapter is to discuss the results of the study and to review any considerations for future research. Again, the following five research questions will be addressed in this chapter:

1. Are students familiar with EC and its availability and mechanism of action?
2. What common risky sexual behaviors do undergraduate students participate in?
3. Is the use of emergency contraception common among this population?
4. What are reasons for students' use of emergency contraception?
5. What relationship exists, if any, between gender and attitudes related to EC?

Knowledge on Emergency Contraception

It was not surprising that the majority of the respondents were familiar with emergency contraception due to the type of population (college students, most of whom were health-sciences majors). However, it was unexpected that most students were aware of its time limit and how long it was effective after unprotected intercourse. There were discrepancies among previous studies that tested similar concepts. For instance, the present study found that most respondents knew that an abortion pill and the emergency contraception pill was not the same thing. However, in a similar study by Corbett et al. (2006), most participants did not know that the abortion pill and the ECP were different. Contrary to Miller (2011), this research found the majority of the sample was knowledgeable when discussing EC and its use.

While it was not expected that respondents would be highly knowledgeable about EC, some of the misconceptions they reported were unexpected. In a study by Miller (2011), over a third of students were unaware of the availability of EC. These findings were similar to those in the present study, as most (n=159; 75%) of the respondents of this study were also unfamiliar with the prescription status of EC. Further, most students were able to differentiate between the mechanism of action of EC and that of monthly birth control. This may have been due to the number of health science majors that participated in the survey, who most likely had increased knowledge of these differences due to information they have learned in their courses. A more random sample of students from a variety of different majors would be necessary to further analyze the differences between knowledge and major. Although differences in knowledge among males and females were not studied, Marcell (2012) revealed that male knowledge about EC was lower than that of females, regardless of the subjects' age.

Attitudes Related to Emergency Contraception

This study found that most students did not believe that women should have EC on hand or that men should buy it in advance for their partner. Moreover, it was found that if EC was provided in advance, most respondents would still not participate in risky behavior. This coincides with findings from Raine et al. (2005), who discovered that advanced provision of EC did not cause participants to compromise the use of contraception or increase risky sexual behavior. Similarly, a large proportion of respondents believed that it was not merely the female's decision to use EC, but that it was also the male's. These findings revealed that there is no increased participation in risky sexual behaviors among this population and that both genders are willing to purchase EC when necessary.

Risky Behaviors

The risky sexual behaviors examined in this study included occurrence of sexual intercourse under the influence of alcohol and/or drugs, age of first intercourse, number of partners within the past year, and frequency of use of protection during intercourse.

In reviewing sex under the influence, of those who were sexually active, most respondents occasionally had sex under the influence. Given the type of sample used (college students), this finding was not unexpected. According to the 2014 American College Health Association Survey, 50.7% of college students drink alcohol between one and nine days per month, and approximately four out of five college students drink alcohol (American College Health Association [ACHA], 2014).

Although the highest percentage of subjects had their first intercourse at age 16 or younger, this number was still very low, revealing that not many students are having sex at such a young age. Similarly, of those respondents who were sexually active, majority only had 1-2 partners within the past year. This was also similar for those who said they used protection every time they had sex. This coincides with the ACHA report, stating that most college students have either one or no sexual partners (ACHA, 2014). In addition, more than half of college students reported that they frequently or always use some type of protection when having vaginal intercourse (ACHA, 2014). Based on these analyses, of the respondents who were sexually active, majority engaged in few risky sexual behaviors and appeared to participate in safe sexual practices (having a low number of sexual partners and frequent use of protection).

Use of Emergency Contraception

Overall, the respondents in this study seemed to have favorable attitudes towards the use of EC and appeared to be open to using it. In responding to the third research question, the use of EC seemed to be low among this population. Similarly, the National College Health Assessment reported that only a small number (16%) of those who were sexually active had previously used emergency contraception (NCHA, 2014).

It is interesting to note that although just under three-quarters of the sample have never used EC, more than half of the population said that they were willing to use EC in the future. Though recent laws have increased access to EC, it has not led to an increased use of the product among this population.

Relationship Between Gender and Attitudes on Emergency Contraception

When looking at the relationship between gender and attitudes related to EC, there was an association between male and female responses related to advanced provision of EC and subsequent participation in risky sexual behavior. Examining the pattern of numbers, more females disagreed that advanced provision of EC would contribute to increased participation in risky sexual behavior compared to males. In addition, there was an association between gender and the use of EC being the females' decision only. Data illustrated that more males believed that it was the females decision to use EC. A similar study by Marcell et al. (2012) found that when surveying males, most agreed that it was ultimately the female's decision to use emergency contraception.

Suggestions for Future Research

This preliminary study investigating the knowledge, use, and perceptions of emergency contraception and participation in risky sexual behaviors necessitates further

research to support these recent findings. In particular, future research is needed to look at the number of individuals who reported multiple risky behaviors. Also, though the respondents demonstrated a high amount of knowledge regarding EC, the health science-related background of the majority of respondents may have contributed to this increased knowledge. Future research should utilize more of a random sample that incorporates an equal proportion of health sciences and non-health sciences majors. Moreover, using a similar number of males and females would increase generalizability to the greater population. It may also be beneficial to determine a correlation, if any, exists between risky sexual behaviors and the use of EC, as well as between risky sexual behaviors and attitudes toward EC.

Conclusion

While knowledge of EC was high among this student population, there are still a number of misconceptions that may affect the use of EC. Wilkinson et al. (2014) showed that constant notifications of policy changes regarding access and availability of EC are critical to maintain awareness. That study also reported that the frequently evolving laws related to EC cause confusion among both adolescents and adults. Further investigation into how these policy changes have affected current use and whether students are aware of the recent changes and/or restrictions regarding EC is needed. Overall, the respondents in this study had a high knowledge and desirable attitudes about EC; however, true/false responses revealed respondents had inadequate knowledge on the access and availability of EC. It is crucial that both men and women have the essential knowledge and desirable attitudes related to sexual health to make educated decisions regarding their sexual behavior to avoid any unwanted outcomes.

Appendix A

Knowledge, Attitudes, and Behaviors Related to Emergency Contraception Among College Students

Gender: Male Female

Year: Freshman Sophomore Junior Senior Graduate student

Major: Health Sciences Non-Health sciences

Please answer true or false for the following questions:

- | | | |
|--|----------|----------|
| 1. A woman cannot get pregnant the first time she has intercourse | T | F |
| 2. Pregnancy is most likely to occur during a female's mid-cycle | T | F |
| 3. Taking 3 hormonal birth control pills is equivalent to 1 emergency contraceptive pill | T | F |
| 4. Emergency contraception can be used as a monthly birth control pill | T | F |
| 5. Emergency contraception can only be taken the "morning after" unprotected sex | T | F |
| 6. Emergency contraception is the same as the abortion pill | T | F |
| 7. Emergency contraception is available over the counter to any age | T | F |
| 8. Emergency contraception can be taken up to 72 hours after intercourse | T | F |
| 9. Emergency contraception can be taken no more than 3 times in a woman's life | T | F |
| 10. Emergency contraception cannot be purchased by a male | T | F |

Please use the scale to answer the following statements:

- | | 1- Agree | 2-Disagree | 3- No opinion |
|---|----------|------------|---------------|
| 1. Women should have emergency contraception pills (ECPs) on hand | 1 | 2 | 3 |
| 2. If I have ECPs on hand, I am more likely to participate in risky sexual behavior | 1 | 2 | 3 |
| 3. Men should buy EC ahead of time for their partner | 1 | 2 | 3 |
| 4. It is okay to not use protection because EC is readily available | 1 | 2 | 3 |
| 5. The use of EC is common among my friends or their partners | 1 | 2 | 3 |
| 6. The use of EC is the female's decision only | 1 | 2 | 3 |
| 7. I repeatedly use EC after having unprotected sex | 1 | 2 | 3 |

Please answer the following questions:

1. Are you sexually active?
 - a. Yes, currently in a monogamous relationship
 - b. Yes, sporadically with one partner
 - c. Yes, sporadically with different partners
 - d. No, not within the past 3 months
 - e. No, I have never been sexually active

2. Please choose the best answer
 - a. Every time I have sex I am under the influence of alcohol and/or drugs
 - b. I occasionally have sex under the influence of alcohol and/or drugs
 - c. I never have sex under the influence of alcohol and/or drugs
 - d. I am not sexually active

3. At what age did you first have intercourse?
 - a. 16 or younger
 - b. 17
 - c. 18
 - d. 19 or older
 - e. I have not had intercourse

4. How many partners have you had intercourse with in the past year?
 - a. 1-2
 - b. 3-4
 - c. 5-6
 - d. 7 or more
 - e. I have not had intercourse

5. What type of contraception do you normally use when having intercourse?
 - a. Birth control pills
 - b. An IUD or implant
 - c. A shot (i.e. Depo-Provera), patch (i.e. Ortho Evra), or birth control ring (i.e. NuvaRing)
 - d. Condom
 - e. Other form of protection
 - f. I do not use any form of protection
 - g. I have not had intercourse

6. How often do you use protection with your partner?
 - a. Every time
 - b. Never
 - c. Sometimes
 - d. I have not had intercourse

7. Have you or your partner ever used emergency contraception?
 - a. Yes
 - b. No

8. What was your primary reason for taking emergency contraception? Please check all that apply.
 - Ineffective contraception—i.e. condom breakage
 - Unprotected sex
 - Fear of method failure
 - Just to “play it safe”
 - Under the influence of alcohol and/or drugs
 - Does not apply—I have not taken EC

9. How many times have you or your partner taken emergency contraception?

- a. None
- b. Once
- c. Twice
- d. Three or more times

10. Who purchased the emergency contraception?

- a. The female
- b. The male
- c. I purchased it with my partner
- d. Does not apply—I have not taken EC

11. If you have **never** taken emergency contraception, why not? Please check all that apply

- I Have not needed it
- Did not know it was available
- Too afraid to purchase it
- I could have used it, but I took my chances instead
- Taking it is against my moral values
- Does not apply—I have taken EC

12. Would you use EC in the future?

- a. Yes
- b. No
- c. Undecided

Appendix B

Cover Letter (Class Surveys)

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Sarah Donohue from James Madison University. The purpose of this study is to assess students' knowledge and attitudes about emergency contraception (EC) and to determine if there is a relationship between sexual behaviors and the use of EC. This study will contribute to the researcher's completion of her senior honors thesis.

Research Procedures

This study consists of a survey that will be administered to individual students in their classes and at the East campus dining hall. You will be asked to provide answers to a series of questions related to assessing your knowledge and attitudes on emergency contraception and sexual health behaviors.

Time Required

Participation in this study will require 10-15 minutes of your time.

Risks

There exists a potential risk of experiencing feelings of discomfort when answering the survey questions. You are free to skip questions that cause such feelings of discomfort. The survey is to assess students' opinions on emergency contraception (EC) and determine if there is a relationship between EC use and sexual behaviors.

Benefits

This study will not provide any direct or indirect benefits to you. However, the benefits of taking part in this survey will be a compilation of information relevant to the field of health education. This study will create social value by illustrating the relationship between sexual behavior and use of EC and may provide valuable information for future studies.

Confidentiality

Confidentiality of the data collected will be maintained throughout the study. Names will not be collected or used in the reporting of the data. The results of this research will be presented at the honors project discussion seminar.

The researcher retains the right to use and publish non-identifiable data. While individual responses are anonymous, aggregate data will be presented representing averages or generalizations about the responses as a whole. All surveys will be stored in a locked file accessible only to the researcher. After data has been entered into SPSS, all surveys will be destroyed.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Your decision to participate or not will have no influence on your grade in class. Should you choose to participate, you can withdraw at any time without consequences of any kind. However, once your responses have been submitted and anonymously recorded you will not be able to withdraw from the study.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Sarah Donohue
Health Sciences
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Dr. Maria T. Wessel
Health Sciences
James Madison University
Telephone: (540) 568-3995
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Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this cover letter and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. I certify that I am at least 18 years of age.

Name of Researcher (Printed)

Name of Researcher (Signed)

Date

Appendix C

Cover Letter (Festival Surveys)

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Sarah Donohue from James Madison University. The purpose of this study is to assess students' knowledge and attitudes about emergency contraception (EC) and to determine if there is a relationship between sexual behaviors and the use of EC. This study will contribute to the researcher's completion of her senior honors thesis.

Research Procedures

This study consists of a survey that will be administered to individual students in their classes and at the East campus dining hall. You will be asked to provide answers to a series of questions related to assessing your knowledge and attitudes on emergency contraception and sexual health behaviors.

Time Required

Participation in this study will require 10-15 minutes of your time.

Risks

There exists a potential risk of experiencing feelings of discomfort when answering the survey questions. You are free to skip questions that cause such feelings of discomfort. The survey is to assess students' opinions on emergency contraception (EC) and determine if there is a relationship between EC use and sexual behaviors.

Benefits

This study will not provide any direct or indirect benefits to you. However, the benefits of taking part in this survey will be a compilation of information relevant to the field of health education. This study will create social value by illustrating the relationship between sexual behavior and use of EC and may provide valuable information for future studies.

Confidentiality

Confidentiality of the data collected will be maintained throughout the study. Names will not be collected or used in the reporting of the data. The results of this research will be presented at the honors project discussion seminar.

The researcher retains the right to use and publish non-identifiable data. While individual responses are anonymous, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. All surveys will be stored in a locked file accessible only to the researcher. After data has been entered into SPSS, all surveys will be destroyed.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. However, once your responses have been submitted and anonymously recorded you will not be able to withdraw from the study.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

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Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this cover letter and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. I certify that I am at least 18 years of age.

Name of Researcher (Printed)

Name of Researcher (Signed)

Date

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