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WOMEN'S CURRENT RELIGIOUS AFFILIATION AND EMERGENCY CONTRACEPTION USE, NATIONAL SURVEY OF FAMILY GROWTH, 2011-2013

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WOMEN'S CURRENT RELIGIOUS AFFILIATION AND EMERGENCY CONTRACEPTION USE, NATIONAL SURVEY OF FAMILY GROWTH, 2011-2013

BY

Dremiane Granby
M.P.H., Emory University, 2016
B.S., Howard University, 2000

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An abstract of
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in the Executive MPH Program
2016

Abstract

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BY
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BACKGROUND: Previous research demonstrates an association between religious affiliation and various forms of contraception among women; however, the association between current religious affiliation and emergency contraception use is not well-examined. We conducted a cross-sectional, quantitative analysis of the association between current religious status and lifetime emergency contraception use among women in the United States.
METHODS: Using data from the 2011-2013 National Survey of Family Growth (NSFG), we examined emergency contraception use among women aged 15-44 years, and its association with current religious affiliation. We estimated prevalence odds ratios and 95% confidence intervals for this association. Both unadjusted and adjusted analyses were conducted using logistic regression, and examining all possible two-way interactions between religious affiliation and each of the co-variables (age, race and ethnicity, residence, United States nativity, income, cohabitation status, and current religious attendance).
RESULTS: Overall, 20% of the women in the 2011-2013 NSFG who reported emergency contraception use reported either no or a specific current religious affiliation. There was significant interaction between current religious affiliation and income. Women within the high income strata and who were Catholic (aOR: 0.60; CI: 0.39-0.91)), Baptist (aOR: 0.46; CI: 0.26-0.81), Protestant (aOR: 0.53; CI: 0.35-0.83), or of Other (aOR: 0.37; CI: 0.20-0.71) religions were less likely to have reported use of emergency contraception compared to women with no religious affiliation within the same income strata.
CONCLUSIONS: Our study estimated a novel association between one's current religious affiliation and self-reported emergency contraception use, further mediated by income status. Our study generates new hypotheses for understanding predictors of emergency contraception use among women in the United States. Partnerships between various religious institutions, and the public health and medical communities can be developed to better understand their integrated dynamics and mechanisms that promote emergency contraception use among women.

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Women's Current Religious Affiliation and Emergency Contraception Use, National Survey of Family Growth, 2011-2013

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ABSTRACT

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INTRODUCTION

Emergency contraception, also referred to as post-coital contraception or emergency birth control, is defined as a method of contraception that can be used to prevent pregnancy in the first five days after sexual intercourse. It can be used to prevent pregnancy following unprotected intercourse, failed or misused contraception, or following a sexual assault (WHO EC, 2016). However, to be effective, emergency contraception must be used before the ovary releases the ovum and before fertilization. Also according to the World Health Organization (WHO), "all women and girls at risk of an unintended pregnancy have a right to access emergency contraception and these methods should be routinely included within all national family planning programmes" (WHO DPHR, 2016). The WHO recommends that emergency contraception should be a part of health care services, more so among women who are at an increased risk of exposure to unprotected sex including "post-rape care and services for women and girls living in emergency and humanitarian settings" (WHO EC, 2016).

BACKGROUND

Emergency Contraception

The historical evolution of emergency contraction is well-documented. In the 1960s, women who were victims of sexual assault were administered high doses of estrogens to prevent unintended or unwanted pregnancies. In the 1970s, a combination hormone therapy (estrogen and progestin) called the Yuzpe regimen replaced the high dose estrogen method, and the copper T intrauterine device (IUD) was also introduced. In the 1990s, emergency contraceptives containing ethinyl estradiol and norgestrel or levonorgestrel, Preven, and Plan B were approved by the US Food and Drug Administration. Based on reports from nine studies including 10,500 women, the WHO recommended levonorgestrel regimen is 52–94% effective in preventing

pregnancy and a copper-bearing IUD is over 99% effective in preventing pregnancy when used after unprotected sex or when traditional contraceptive methods have failed (WHO EC, 2016). The evolution of emergency contraception has resulted in its increased acceptance by physicians as well as women of childbearing age. This, in turn, has necessitated state legislatures to respond to this acceptance by enacting laws that increase its availability and accessibility. As of 2015, there are 31 states and the District of Columbia that have emergency contraception policies. Of these, 11 states (Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Illinois, Maine, Mississippi, South Dakota, and Tennessee) have laws that allow pharmacy and/or pharmacists to refuse to dispense emergency contraception.

In the National Survey of Family Growth that was conducted in 2006–2010, approximately one in nine (11% or 5.8 million) women who were sexually active had ever used emergency contraception, up from 4.2% in 2002 (Daniels et al., 2013). Global emergency contraceptive use is quite varied. Data from the Demographic Health Surveys conducted in 45 countries between 2000 and 2012 reported the prevalence of emergency contraception use among all women in Latin America (3.5%), Europe and West Asia (2.3%), Asia (0.3%), and Africa (15%) (E2A Evidence, 2016).

Even with the recommendations by WHO and increasing acceptance of emergency contraception in the US and around the world, there are concerns regarding whether its use is associated with increased risks of negative outcomes on cardiovascular health, future fertility, drug interactions, abuse, and risky sexual encounters (Norris Turner & Ellertson, 2002). Women who have a history of thromboembolic disease or migraines are not able to use combined hormonal contraception on a regular basis due to adverse medical reactions, however, emergency contraception pills can be safely used by women who have these contraindications (Prine, 2007).

Overall, some advantages of emergency contraception are that they: a) are safe and effective in preventing pregnancy after unprotected sex; b) do not require consent from the male partner; and c) are mostly available over-the-counter in pharmacies (OPA, 2016). According to a review conducted by Lalitkumar et al. (2012), some of the barriers to the use of emergency contraception are: a) women at high risk of conception are not aware they are at risk of unintended pregnancy; b) the terms that are used to reference emergency contraception (i.e. "morning after pill" or "post-coital contraception") may be misinterpreted to be synonymous with an abortion pill; c) and a lack of knowledge about how emergency birth control works.

Emergency contraception use in the US is shown to be associated with the age of the woman, marital status, race and ethnicity, and education. Daniels et al. (2013) reported that women using emergency contraception are generally between the ages of 20-24 years old, never married, Hispanic/Non-Hispanic, and hold a bachelor's degree or higher degree; conversely, non-users tend to be between the ages of 30-44 years, currently or formerly married, Non-Hispanic Black, and have less than high school education (Daniels et al., 2013).

Religion and contraceptive use

According to the 2014 Pew Research Center Religious Landscape Study on religious affiliation in a nationally representative sample in the United States, 71% (n=35,000) of the survey participants (adults 18 years of age and over of which 50% were women) reported their current religious affiliation to be Christian, including Evangelical Protestant (47%), Catholic (21%), Mainline Protestant (15%), Historically Black Protestant (7%), and other Christian faiths (5%) (i.e. Mormon, Orthodox Christian, Jehovah's Witness, Other Christian). The non-Christian faiths constitute only 6% (n=2100) and include Jewish, Muslim, Buddhist, Hindu, Other World Religions, and other faiths). The remaining 23% were unaffiliated with any religion (Atheists,

Agnostic, or Nothing in Particular) (Pew Research Center, 2015). In 2007, the distribution of current religious affiliation varied from the 2014 statistics: there were more Christians (78%), less Non-Christians (5%), and less unaffiliated with any religion (16%). This increase in the representation for those unaffiliated with any religion from 2007 to 2014, coincides with the findings from the NSFG, 2011-2013 in that those who do not have a current religion are the most likely, when compared to those with a current religious affiliation, to use emergency contraception (27%).

The association between religion and contraceptive use is important, especially because it has been shown that religious factors impact the contraceptive use patterns and the timing of childbearing within the life course of men and women in the United States (Goldscheider & Mosher, 1991). Religious affiliations contribute to strong beliefs and codes of conduct as it relates to procreation: in Judaism, the husband indicates the acceptable method of contraception and must take into consideration rabbinical ruling; some sects of Protestants find contraceptives acceptable when married couples already have children (Srikanthan, 2008). Within Catholicism, every act of intercourse must remain open to conception and contraception destroys any potential to produce new life and violates the principal purpose of marriage (Srikanthan, 2008). Further, Catholic hospitals in the United States do not provide emergency contraception under any circumstances to any women, including instances of rape (Kavanaugh & Schwarz, 2008). In a London-based telephone survey of 1,354 women aged 13 – 49 years assessing factors influencing women's use and non-use of emergency contraception, one of the reasons given for non-use of emergency contraception were moral or religious in nature (Free et al., 2002). Corbett et al. (2006) examined the knowledge and perception of emergency contraception among

men and women attending a U.S. university, and reported that 90% of women who were "very unlikely" to use emergency contraception stated they had moral or religious objections to its use.

Previous research has focused on people's attitudes and perceptions of emergency contraception, but, to our knowledge, the association between emergency contraception use and religious affiliation has not been studied. It is hence worthwhile to further research the association between religious affiliation and emergency contraception, so that we can address challenges associated with religion in the uptake of this highly effective intervention among women, especially among at-risk groups. We aim to address this question using a nationally representative sample of women participating in the 2011-2013 National Survey of Family Growth (NSFG).

METHODS

The NSFG is a cross-sectional survey conducted by the National Center for Health Statistics division of the Centers for Disease Control and Prevention (CDC). Eight cycles have already been completed since its inception in 1973. The NSFG surveys non-institutionalized women and men aged 15 – 44 years within the 50 states and gathers information on family life, marriage, divorce, health, pregnancy, infertility, and contraception (CDC, 2016). The survey results are used by the U.S. Department of Health and Human Services and other research and policy organizations to plan health services and health education programs and to conduct analyses to better understand the health of the target population.

In order to assess the association between religious affiliation and emergency contraception use, we analyzed data from 5,601 female respondents aged 15-44 years from the NSFG which was conducted from September 2011 through September 2013. The overall

weighted response rate was approximately 73%, with the female response rate also at approximately 73%.

Exposure Variable

The main exposure variable for our study was a woman's current religious affiliation. Among those who completed NSFG surveys, 99.7% answered the question: "What is your current religion, if any?" The religions listed were as follows: a) No religion, b) Catholicism, c) Baptist or Southern Baptist, d) Methodist or Lutheran or Presbyterian or Episcopal, d) Fundamentalist Protestant, e) Other Protestant, f) Protestant-No specific Denomination, g) Other, h) Refused, and i) Don't Know. For those who selected "Other", they were then permitted to provide responses indicating the specific religious affiliation. The responses provided within the "Other" category were: Jewish, Church of Latter Day Saints, Jehovah's Witness, Unitarian-Universalist, Greek Orthodox, Muslim, Buddhist, Hindu, Native American religions, Taoic religions, Neopagan religions, or other - not shown separately. For our analysis, we re-categorized current religious affiliation into six categories: a) No religion, b) Catholicism, c) Baptist/Southern Baptist, d) Methodist/Lutheran/Presbyterian/Episcopal, e) Protestant, and f) Other. We excluded those with responses of 'Don't Know' and 'Refused'.

Since the NSFG also surveys participants about their religious affiliation in the past, the religion in which an individual raised was also examined. The NSFG question regarding the religion in which the participant was raised asked, "What was the religion in which you were raised, if any?" The responses were categorized using the same criteria as described above for current religious affiliation.

Outcome Variable

We examined the use of emergency contraception as the main outcome of our study. The women responded "yes", "no", or "refused" (to answer) the question: "Have you ever used emergency contraception, also known as "Plan B", "Preven", "Ella", or "Morning after pills"?"

Co-variates

We examined as co-variates socio-demographic factors including age (15-19, 20-24, 25-29, 30-34, 35-44), race and ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic other), income (200% and greater, 100%-199%, and 0%-99% of the United States poverty level), United States nativity (yes , no), residence locality (metropolitan, non-metropolitan), current religious attendance (none of the time, once per week, more than once per week, and less than 36 times per year), and cohabitation status (ever been married/cohabitated and have never married/cohabitated)

Statistical Analysis

NSFG is a nationally representative survey, and our analysis accounted for the sampling by integrating a weighted analysis, which accounted for sample weights, strata and clusters. We compared the socio-demographic characteristics of women who did and did not report ever having used emergency contraceptives using Wald Chi-square tests. Collinearity was assessed using conditional indexes greater than 30 and variance decomposition proportions greater than 0.5. Statistical significance was assessed using an alpha level of 0.05. We examined the association between current religious affiliation and emergency contraceptive use by multivariable logistic regression analysis, and considered all possible two-way interactions between religious affiliation and each of the co-variates (income, race and ethnicity, residence locality, United States nativity, age, cohabitation status, current religious attendance). Interactions between the main exposure and each of the co-factors was assessed at an alpha level

of 0.05. Factors not identified as effect modifiers were assessed for confounding. Confounding assessment was conducted using a 10% change-in-estimate approach, where a variable was retained in the model if removing it changed the odds ratio for the effect of the exposure by more than 10%. We estimated crude and adjusted odds ratios and 95% confidence intervals considering complex survey procedures. All analyses were conducted using SAS 9.4 (SAS, Cary, NC). The Institutional Review Board (IRB) of Emory University approved this study, and as it is a secondary analysis of publicly-available data, deemed it exempt from Full IRB review.

RESULTS

Of the total 5,601 women who participated in the NSFG 2011-2013 survey, 4,855 (87%) reported ever having heterosexual intercourse and answered "yes" or "no" to ever having used emergency contraception, and were included in this analysis. Overall, 20% of the women reported ever having used emergency contraception (n= 947) and provided religious information which was classified as: (a) None (27%), b) Catholic (21%), c) Baptist (12%), d) Methodist, Lutheran, Presbyterian, Episcopal (11%), e) Protestant (22%), and f) Other (6%)), and 80% (a) None (20%), b) Catholic (23%), c) Baptist (16%), d) Methodist, Lutheran, Presbyterian, Episcopal (9%), e) Protestant (23%), and f) Other (9%).

Women who reported ever having used emergency contraception were significantly different from those who did not with respect to age, education, race and ethnicity, income, cohabitation status, current and past religious affiliation, current religious attendance, residence locality, and religious importance ($P < 0.05$) (Table 1). Among women reporting ever having used emergency contraception, the majority of them were 20-24 years old (30%), were college educated (70%), were Non-Hispanic White (56%), lived in a metropolitan area (89%), had ever been married or cohabitated (77%), and had high income (50%). Also, the remaining women in

this group had private health insurance (54%), were working full time (44%), were born in the United States (88%), were not currently affiliated with any religion (27%), were raised in the Catholic denomination (33%), attended religious services less than once a month and at least once a year (32%), and felt that religion was very-somewhat important in daily life (88%) (Table 1). Specific distribution of characteristics for women who did not report emergency contraception in the 2011-2013 NSFG survey are given in Table 1.

In unadjusted analyses, women whose current religious affiliation was Catholic (cOR: 0.71; 95% CI: 0.54, 0.92), Baptist (cOR: 0.58; 95% CI: 0.40, 0.84), or Other denominations (cOR: 0.54; 95% CI: 0.33, 0.90) were less likely to use emergency contraception compared to women who had no current religious affiliation (Table 1). In addition to current religious affiliation, we examined the role of religious affiliation a woman was raised in and its association with emergency contraception use. In this regard, we found that women who were raised as Baptists (cOR: 0.49; 95% CI: 0.32, 0.75), and currently attended religious services at least once per week (cOR: 0.67; 95% CI: 0.47, 0.95), and felt religion was very-somewhat important (cOR: 0.59; 95% CI: 0.39, 0.89) were less likely than women who were raised without a religious affiliation, who did not currently attend religious services, and who felt religion was not important in daily life to use emergency contraception (Table 1).

We further examined the association between religious affiliation and emergency contraception by stratifying by income and adjusting for religious attendance, age, race and ethnicity, residence locality, United States nativity, and religious attendance. In the multivarible analyses, we identified an overall significant interaction between current religious affiliation and income (*P* value 0.03). Current religious affiliation predicted emergency contraception non-use only among women with high incomes: women who were Catholic (aOR 0.60; CI: 0.39-0.91),

Baptist (aOR 0.46; CI: 0.26-0.81), Protestant (aOR 0.53; CI: 0.35-0.83), and of Other religions (aOR 0.37; CI: 0.20-0.71) were less likely to report lifetime emergency contraception use compared to women with no religious affiliation within the same income strata. We did not observe a significant relationship between religious affiliation and emergency contraception among women in the middle and low income groups (Table 2).

DISCUSSION

In using a nationally representative sample from the 2011-2013 NSFG survey, we found a novel and significant association between current religious status and emergency contraception use among women aged 15-44 years in the US, among women with high incomes. There was a significant negative association between emergency contraception use and women with a high income who were Catholic (aOR: 0.60; 95% CI: 0.39-0.91), Baptist (aOR: 0.46; 95% CI: 0.25-0.83), Protestant (aOR: 0.54; 95% CI: 0.35-0.84), or of Other (aOR: 0.36; 95% CI: 0.19-0.70) religions. This study is important in that it provides the latest evidence on how current religion and an individual's income status is associated with emergency contraception use. There have been no previous studies that examined the role of current religious affiliation with emergency contraception use making it impossible to compare our findings.

Our findings are exploratory and hypothesis generating. There are certain biases that could have existed with this study. First, eligible women who were excluded from the analysis due to missing data also showed similar significance/insignificance in the association of religious affiliation and emergency contraception when stratified by income. There was a significant association in for women with high incomes that did not know or refused to provide a response to current religious affiliation and refused to provide a response to emergency contraception use. For those women with similar responses, but in other levels of income, the results were

insignificant (data not shown). Second, the main exposure and outcome variables were religion and emergency contraception, both of which tend to be misreported because of social desirability, which could bias our findings. (Grimm, 2010). Women who were considered to be "deeply religious" in terms of attending religious services frequently and actively practicing their religion in their daily lives, could have answered "no" to ever having used emergency contraception due to fear of ridicule and/or punishment by God or the "Church". This response would have ultimately skewed the results away from the null. Also, women who falsely indicated never having heterosexual intercourse would have been excluded from the emergency contraception question. If these women have different patterns of emergency contraception use with respect to their religious affiliation compared to those included in our analysis, our results may be biased. Non-response/response bias is another bias that could exist with this study. It is believed that most people who respond to surveys tend to be more involved in civic duties. As a result, the measures of religious affiliation and observance would be inflated (Cooperman & Smith, 2015).

One of the strengths of this study was the fact that the NSFG is a nationally representative sample. Also, in using these data we are reporting the most current information, thus creating an opportunity to better address and identify women of certain religious affiliations who are at risk of unintended pregnancy and may or may not be aware of or use emergency contraception. Another strength of the study was the use of the current religious affiliation variable which allowed us to examine specific categories of religious affiliations and their association with emergency contraception use. Finally, NSFG had a high response rate (73%), and a relatively large sample which allowed us to obtain fairly precise odds ratio estimates.

Our study has limitations. We were unable to explore some of the religions that were grouped under "Other" current religious affiliation categories due to small numbers. We also opine that due to inherent limitations of a secondary data analysis, some of the survey questions related to religion may not have truly captured the essence of religiosity, which in turn could potentially affect the measurement of association between religious affiliation and emergency contraception. Thus, we consider our analysis to be exploratory and hypothesis generating. A survey that is specifically designed to examine this hypothesis would provide a more meaningful assessment of a woman's religious involvement and reproductive health choices. Another important limitation of this study is pregnancy intent was not taken into consideration. It is possible pregnancy intention differs by religion and income. This difference could explain the results delineated in Table 2 (women of high income were not using emergency contraception because they were more likely to plan a pregnancy).

CONCLUSION

Since there are religions, such as Catholicism which are conservative in their views of contraception in general, it could be interpreted that the findings from this analysis tend to coincide with those views. Further, the findings from this study somewhat coincide with the findings from the 2006-2010 NSFG survey in that as income increased, the prevalence of birth control pill use increased: 19% of women with low incomes used birth control pills compared to 39% of women with high incomes (NSFG, 2016). If women of higher incomes are more likely to use birth control pills, we would expect that they would have less need for emergency contraceptives. In the future, in order to obtain a more complete picture of the true association between religious affiliation and emergency contraception, surveys should be conducted with more detail and rigor and should be culturally appropriate and sensitive to the women's beliefs.

Further analysis could be performed assessing the difference between women's current religious affiliation and the religion in which women were raised to determine the association between emergency contraception and whether a woman has changed her religious affiliation in her lifetime. It may also be purposeful to conduct multivariable analysis using the same cofactors presented in this study and using the religion in which a woman was raised as the outcome variable. Parity, abortion status, and pregnancy intention are a few potential confounders that could be used in future analyses that we were unable to control for in the present study. These factors have the potential to be confounders because they are associated with both emergency contraception and religious affiliation. Capturing geographic information as it relates to this survey and/or other surveys in which to conduct additional analyses would beneficial in order to identify geographic trends that may additionally confound the religious affiliation and emergency contraception association.

According to the responses reported in the NSFG, there has been a steady increase in the prevalence of emergency contraception use over the past ten years: 4.2% (2.3 million) in 2002, 11% (5.8 million) in 2006-2010, and 18% (9.6 million) in 2011-2013. These prevalence rates are important because they provide information that can be used by public health professionals to develop initiatives to assist these populations. Also, since there have not been any previous studies assessing the association of religious affiliation and emergency contraception, this study generates hypotheses for future analyses on emergency contraception use among women in the U.S. This study suggests that more partnerships may need to be forged between various religious institutions, and the public health and medical communities to further understand the interplay between religious affiliation and emergency contraception use among women of reproductive age in the U.S. Public health education would be necessary to imbibe knowledge

and clarify misunderstanding related to emergency contraception, its availability, and how it can be accessed.

REFERENCES

Advocates for Youth (2016). Emergency contraception: safe and effective options for preventing pregnancy after unprotected sex. Retrieved January 27. 2016 from

Boonstra, Heather D. (2008). Matter of faith: support for comprehensive sex education among faith-based organizations.Guttmacher Policy Review, *11*(1). Retrieved from https://www.guttmacher.org/pubs/gpr/11/1/gpr110117.html

Brening, R. K., Dalve-Endres, A. M., & Patrick, K. (2003). Emergency contraception pills (ECPs): current trends in United States college health centers. *Contraception, 67*(6), 449-456. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12814813

Centers for Disease Control (2016). National Survey of Family Growth. Retrieved January 24, 2016 from http://www.cdc.gov/nchs/nsfg/nsfg_2011_2013_puf.htm.

Cooperman, A., Smith, G. (2015). Response from pew research center to "in polls we trust". Retrieved April 19, 2016 from http://www.firstthings.com/web-exclusives/2015/07/response-from-pew-research-center-to-in-polls-we-trust

Corbett, P. O., Mitchell, C. P., Taylor, J. S., & Kemppainen, J. (2006). Emergency contraception: knowledge and perceptions in a university population. *J Am Acad Nurse Pract, 18*(4), 161-168. doi:10.1111/j.1745-7599.2006.00114.x

Daniels, Kimberly, PhD., Jones, Jo, PhD., Abma, Joyce, PhD (2013). Use of emergency contraception among women aged 15-44: United States, 2006-2010. NCHS Data Brief. No. 112. http://www.cdc.gov/nchs/data/databriefs/db112.htm Retrieved March 30, 2016

Drugs (2016). Preven EC. In Drugs. Retrieved January 27, 2016, from http://www.drugs.com/preven-ec.html

Emergency Contraception: Four Country Case Studies on the Introduction and Scale-Up of Emergency Contraception. In *E2AEvidence to Action*. Retrieved March 30,2016 from http://www.e2aproject.org/publications-tools/pdfs/ec-four-country-case-studies.pdf

Finer, L. B., & Zolna, M. R. (2011). Unintended pregnancy in the United States: incidence and disparities, 2006. *Contraception, 84*(5), 478-485. doi:10.1016/j.contraception.2011.07.013

Free, C., Lee, R. M., & Ogden, J. (2002). Young women's accounts of factors influencing their use and non-use of emergency contraception: in-depth interview study. *Bmj, 325*(7377), 1393.

Goldscheider, C., & Mosher, W. D. (1991). Patterns of contraceptive use in the United States: the importance of religious factors. *Stud Fam Plann, 22*(2), 102-115.

Grimm, P. 2010. Social Desirability Bias. Wiley International Encyclopedia of Marketing. 2.

Hill, N. J., Siwatu, M., & Robinson, A. K. (2014). "My religion picked my birth control": the influence of religion on contraceptive use. *J Relig Health, 53*(3), 825-833. doi:10.1007/s10943-013-9678-1

Kavanaugh, M. L., & Schwarz, E. B. (2008). Counseling about and use of emergency contraception in the United States. *Perspect Sex Reprod Health, 40*(2), 81-86. doi:10.1363/4008108

Lalitkumar, P.G.L., phD, Berger, Cecilia, MD, Gemzell-Danielsson, Kristina (2012). Emergency contraception. *Best Practice & Research Clinical Endocrinology & Metabolism,* 27(2013), 91-101.

National Survey of Family Growth (2016) In Centers for Disease Control and Prevention. Retrieved January 27, 2016, from http://www.cdc.gov/nchs/nsfg.htm
National Survey of Family Growth User Manual (2016) In Centers for Disease Control and Prevention. Retrieved January 27, 2016, from http://www.cdc.gov/nchs/data/nsfg/nsfg_2011-2013_userguide_maintext.pdf#General.
Norris Turner, A., & Ellertson, C. (2002). How safe is emergency contraception? *Drug Saf, 25*(10), 695-706.
Office of Population Affairs (OPA) (2016). Emergency Contraception Fact Sheet Retrieved January 27. 2016 from http://www.hhs.gov/opa/reproductive-health/contraception/emergency-contraception/#
ParaGard (2016) In Mayo Clinic. Retrieved March 23, 2016, from http://www.mayoclinic.org/tests-procedures/paragard/basics/definition/prc-20013048.
Pew Research Center (2015). America's Changing Religious Landscape. Retrieved January 24, 2016 from http://www.pewforum.org/2015/05/12/americas-changing-religious-landscape/
Plan B. One Step (2016). About Plan B One Step Retrieved January 27, 2016, from http://www.planbonestep.com/about.aspx
Prine, L. (2007). Emergency Contraception, Myths and Facts. *Obstetrics and Gynecology Clinics of North America, 34*(1), 127-136. doi:http://dx.doi.org/10.1016/j.ogc.2007.01.004
Sex, Etc. (2016). Sex in the StatesRetrieved January 27, 2016, from http://sexetc.org/states/colorado/
Srikanthan, A., & Reid, R. L. (2008). Religious and cultural influences on contraception. *J Obstet Gynaecol Can, 30*(2), 129-137. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/18254994
Stacey, Dawn M. Ed, LMHC (2014). The history of emergency contraception. Retrieved from http://contraception.about.com/od/emergencycontraception/fl/The-History-of-Emergency-Contraception.htm
Stacey, Dawn M. Ed, LMHC (2014). What do religions say about birth control and family planning?The Retrieved from http://contraception.about.com/od/additionalresources/ss/religion.htm#showall
Update on Emergency Contraception (2011) In Association of Reproductive Health Professionals Retrieved March 30, 2016 from https://www.arhp.org/Publications-and-Resources/Clinical-Proceedings/EC/safety
Weiss DC, Harper CC, Speidel JJ, Raine TR. (2008). Is emergency contraception cost-effective? *Bixby Center for Global Reproductive Health, University of California, San Francisco.* April 2008. Retrieved January 26, 2016 from http://bixbycenter.ucsf.edu/
World Health Organization: Department of Reproductive Health and Research (2016). Ensuring human rights within contraceptive programmes: a human rights analysis of existing quality indicators. Retrieved March 30, 2016 from http://apps.whoint/iris/bitstream/10665/126799/1/9789241507493_eng.pdf?ua=1
World Health Organization (WHO) (2016). Emergency contraception. Retrieved January 27, 2016, from http://www.whoint/mediacentre/factsheets/fs244/en/

Figure 1. Flow Chart of National Survey of Family Growth, 2011-2013 Female Respondents Included and Excluded in Analysis

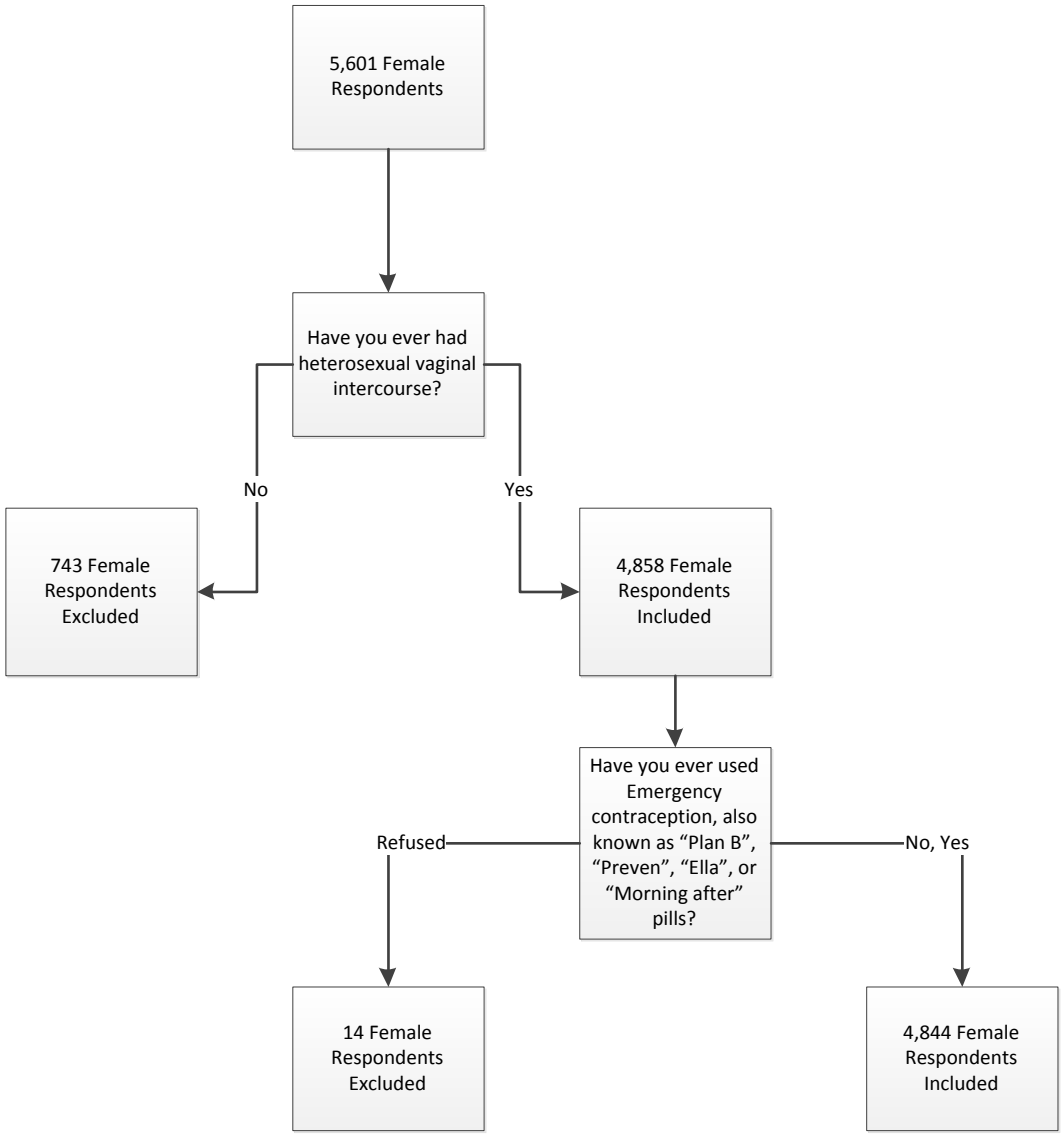

Table 1. Characteristics of National Survey of Family Growth (2011-2013) female respondents aged 15-44 years who reported ever having heterosexual intercourse by self-reported lifetime emergency contraception (EC) use

Characteristic	Used EC		Have Not Used EC		Crude OR	**95% CI*	*P-value*
	n=947	Weighted%	n=3897	Weighted%			
Age at Interview							
15-19	92	9.7%	386	7.6%	1	---	<0.0001
20-24	**265**	**30.0%**	585	13.5%	**1.76**	**(1.13-2.74)**	
25-29	270	26.3%	765	17.4%	1.19	(0.80-1.78)	
30-34	185	17.6%	768	19.4%	0.72	(0.45-1.14)	
35-44	135	16.4%	**1393**	**42.1%**	**0.31**	**(0.20-0.48)**	
	947		3897				
Education Level							
Less than High School	29	2.9%	354	6.9%	1	---	0.0001
High School	313	28.5%	**1494**	**35.5%**	1.89	(0.97-3.69)	
College[a]	**362**	**40.5%**	1181	29.9%	**3.18**	**(1.68-6.04)**	
Bachelor's Degree and Higher	243	28.0%	868	27.7%	**2.38**	**(1.26-4.46)**	
	947		3897				
Race and Ethnicity							
Non Hispanic-White	**429**	**56.3%**	**1834**	**59.6%**	1	---	0.04
Non Hispanic-Black	188	14.5%	886	14.9%	1.03	(0.69-1.54)	
Hispanic	291	23.9%	953	19.0%	**1.33**	**(1.07-1.66)**	
Non Hispanic Other/Multiple Races[b]	39	5.3%	224	6.6%	0.86	(0.57-1.30)	
	947		3897				
Cohabitation Status							
Ever Married or Cohabitated	**718**	**77.0%**	**3106**	**83.6%**	1	---	0.0006
Never Married or Never Cohabitated	229	23.0%	791	16.4%	**1.52**	**(1.20-1.94)**	
	947		3897				
Income Level[c]							
High	**417**	**50.2%**	**1668**	**51.0%**	1	---	*0.38*
Medium	239	24.1%	868	21.1%	1.16	(0.84-1.61)	
Low	291	25.7%	1361	27.9%	0.93	(0.73-1.20)	
	947		3897				

[a]Includes some college and associate degree;

[b]Includes American Indian or Alaskan Native, Asian, Native Hawaiian or other Pacific Islander

[c]Income considered is in comparison to poverty level (High: >200%; Medium: 100-199%; Low: 0-99%)

P-value based on Wald Statistic (<0.05 is significant; >0.05 is not significant)

* CI is Confidence Interval; EC is Emergency Contraception; OR is Odds Ratio

Table 1 (continued). Characteristics of National Survey of Family Growth (2011-2013) female respondents aged 15-44 years who reported ever having heterosexual intercourse by self-reported lifetime emergency contraception (EC) use

Characteristic	Used EC		Have Not Used EC		Crude OR	*95% CI	*P-value*
	n=947	Weighted%	n=3897	Weighted%			
Insurance Type							
Single Service or No Coverage	204	23.4%	903	21.2%	1	---	0.42
Government Plan	61	5.9%	240	4.8%	1.11	(0.72-1.69)	
State Sponsored Plan	213	16.7%	887	16.3%	0.93	(0.63-1.37)	
Private Health Insurance	**469**	**54.0%**	**1867**	**57.6%**	0.85	(0.64-1.13)	
	947		3897				
Residence Locality							
Metropolitan	**859**	**89.0%**	**3294**	**83.8%**	1	---	0.01
Non-Metropolitan	88	11.0%	603	16.2%	**0.64**	**(0.45-0.90)**	
	947		3897				
Employment Status							
Not Working	305	28.2%	1431	31.8%	1	---	0.15
Full Time	**412**	**43.6%**	**1548**	**44.4%**	1.11	(0.84-1.46)	
Part Time	199	23.9%	744	19.3%	1.40	(1.00-1.96)	
On Leave	31	4.3%	174	4.4%	1.09	(0.59-2.01)	
	947		3897				
United States Native							
Yes	**830**	**87.8%**	**3253**	**84.8%**	1	---	0.18
No	117	12.2%	644	15.2%	0.78	(0.54-1.12)	
	947		3897				

P-value based on Wald Statistic (<0.05 is significant; >0.05 is not significant)

* CI is Confidence Interval; EC is Emergency Contraception; OR is Odds Ratio

Table 1 (continued). Characteristics of National Survey of Family Growth (2011-2013) female respondents aged 15-44 years who reported ever having heterosexual intercourse, by self-reported lifetime emergency contraception (EC) use

Characteristic	Used EC		Have Not Used EC		Crude OR	**95% CI*	*P-value*
	n=947	Weighted%	n=3897	Weighted%			
Current Religion							
No Religion	**246**	**27.0%**	752	20.3%	1	---	0.04
Catholic	233	21.3%	855	22.6%	**0.71**	**(0.54-0.92)**	
Baptist	123	12.4%	741	16.1%	**0.58**	**(0.40-0.84)**	
Methodist, Lutheran, Presbyterian, Episcopal	66	11.2%	291	8.7%	0.97	(0.62-1.50)	
Protestant	226	21.8%	**955**	**23.3%**	0.70	(0.48-1.03)	
Other	53	6.4%	303	8.9%	**0.54**	**(0.33-0.90)**	
	947		3897				
Religion Raised[a]							
No Religion	103	11.6%	360	9.0%	1	---	0.0002
Catholic	**336**	**32.8%**	**1227**	**32.7%**	0.78	(0.53-1.14)	
Baptist	150	12.9%	925	20.6%	**0.49**	**(0.32-0.75)**	
Methodist, Lutheran, Presbyterian, Episcopal	96	15.8%	368	11.2%	1.10	(0.64-1.89)	
Protestant	185	18.0%	699	16.9%	0.83	(0.49-1.38)	
Other	75	8.9%	318	9.6%	0.72	(0.46-1.12)	
	945		3897				
Current Religious Attendance[b]							
None	271	28.1%	961	24.6%	1	---	0.01
Less than Once Per Week and At Least Once a Month	176	18.3%	824	21.3%	0.75	(0.55-1.03)	
At Least Once Per Week	195	21.6%	**1163**	**28.3%**	**0.67**	**(0.47-0.95)**	
Less than Once a Month and At Least Once a Year	**304**	**32.0%**	948	25.8%	1.09	(0.85-1.40)	
	946		3896				
Religious Importance							
Not Important	61	11.7%	181	7.2%	1	---	0.01
Very Important or Somewhat Important	**640**	**88.3%**	**2963**	**92.8%**	**0.59**	**(0.39-0.89)**	
	701		3144				

[a]Based on exclusion criteria created with religion raised as the exposure variable

[b]Based on exclusion criteria created with current religion as the exposure variable

P-value based on Wald Statistic (<0.05 is significant; ≥0.05 is not significant)

* CI is Confidence Interval; EC is Emergency Contraception; OR is Odds Ratio

Table 2. Adjusted[a] odds ratios for the association between religious affiliation and self-reported lifetime emergency contraception use in female National Survey of Family Growth (2011-2013) respondents aged 15-44 years who have had heterosexual intercourse by income[b]

Characteristic	Income		
	High Adjusted Odds Ratio; 95% C.I.	**Medium** Adjusted Odds Ratio; 95% C.I.	**Low** Adjusted Odds Ratio; 95% C.I.
Current Religion			
No Religion	1	1	1
Catholic	**0.60 (0.39-0.91)**	0.67 (0.31-1.44)	1.21 (0.69-2.11)
Baptist	**0.46 (0.26-0.81)**	0.83 (0.35-1.99)	1.11 (0.54-2.28)
Methodist, Lutheran, Presbyterian, Episcopal	1.00 (0.60-1.67)	0.64 (0.24-1.69)	2.54 (0.98-6.57)
Protestant	**0.53 (0.35-0.83)**	0.95 (0.47-1.90)	1.29 (0.65-2.57)
Other	**0.37 (0.20-0.71)**	1.16 (0.44-3.07)	1.13 (0.57-2.23)

[†] C.I. Confidence interval

[a]Adjusted for cohabitation status, age, race and ethnicity, residence locality, current religious attendance, United States nativity, and income

[b]Income considered is in comparison to the United States poverty level (High: >200%; Medium: 100-199%; Low: 0-99%)