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Analysis of Intrauterine Device Implementation and Review of Prevention Strategies to Reduce Adolescent Pregnancy in Nicaragua

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Analysis of Intrauterine Device Implementation and Review of Prevention Strategies to Reduce
Adolescent Pregnancy in Nicaragua

By

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Abstract

Adolescent pregnancy is one of the main healthcare issues facing Nicaragua. Prevention strategies are needed to avoid the maternal and fetal outcomes associated with young pregnancies. Extensive literature analysis and face-to-face discussions in Nicaragua were conducted to determine the current incidence of adolescent pregnancy and contraception use, barriers to reproductive health for adolescents, maternal outcomes of adolescent pregnancy, and if intrauterine devices have the potential to be a culturally effective method of contraception. Specific barriers to reproductive health for adolescents were identified to be machismo, societal criticism, lack of reproductive education, fear of infection from IUDs, and underutilization of healthcare facilities. Intrauterine devices are more effective and have a lower discontinuation rate compared to other contraceptives. Intrauterine devices also provide an option for a less extensive treatment regimen following implantation compared to daily or monthly dosing with other contraceptives. However, current attitudes regarding IUDs for contraception remain skeptical, which explains why they are the least favored contraceptive method in Nicaragua. Solely educating clinicians and patients about the effectiveness of IUDs does not increase their use nor change patient and provider attitudes. Instead, a multifactorial approach to IUD implementation has shown increased uptake of IUDs as contraception and has given hope for adolescent pregnancy prevention.

Introduction

According to the World Health Organization, Nicaragua has one of the highest adolescent birth rates in the world, with 149 births per 1000 women compared to 54.4 births per 1000 women here in the United States. Adolescents make up 24% of the total Nicaraguan population and 25% of women have already been pregnant by the age of 17. Many factors contribute to national birth rate statistics. Increasing pregnancies among young women correlate with countries that are poor and underdeveloped like Nicaragua.¹

Adolescent pregnancies and births pose a significant threat to maternal and fetal health. When pregnancies are unwanted or unplanned, they often result in significant emotional distress for the mother. Higher prevalence of anxiety and depression has been associated with pregnant mothers in Nicaragua than pregnant mothers in developed countries. This is concerning not only to the mother, but also to the child, as anxiety and depression during pregnancy can lead to adverse fetal outcomes including low birth weight, preterm labor, insecure mother-child attachment, and cognitive issues.²

This literature review explores the major contributing factors to Nicaragua's strikingly high incidence of adolescent pregnancies and offers a solution to reduce pregnancy rates by implementing clinic-level reproductive education with a focus on contraception. Specifically, research was conducted to determine if intrauterine devices (IUDs) are an effective method of prevention for teens in Nicaragua. Once an IUD is implanted, the patient is highly protected without needing further treatments or medication regimens. It is hypothesized that a less demanding treatment regimen may result in increased pregnancy prevention compared to contraceptives that require daily medication dosing or monthly injections.

Background: Literature Review

Current Incidence of Adolescent Pregnancy and Contraception Use in Nicaragua

I. Adolescent Pregnancy

Nicaragua has arguably the highest adolescent pregnancy rate in all of Latin America and since the total ban on abortion in 2006, suicide among pregnant teens has increased in prevalence.^{3,4} Many women in Nicaragua are largely unaware of their reproductive rights and lack control of their own fertility, which contributes to the 58% of total pregnancies in Latin America and the Caribbean that were classified as unplanned pregnancies in 2008.⁵ To better understand the prevalence of adolescent pregnancy, the age of sexual debut and risk factors for young sexual behavior were analyzed. According to a study of 2803 adolescents living in poor neighborhoods of Managua, sexual behavior correlated with “personal characteristics (sex and alcohol use), interactions with others (parents, partners, peers) and to the environment (housing condition, religion)”.⁴ The study also found earlier sexual onset correlated with alcohol consumption, not living with parents, and the male gender.

II. Contraceptive Use

Current contraceptive use among adolescents has not been exclusively studied on a population-basis in Nicaragua. However, one 2014 survey revealed that of the sexually active male and female participants ($n_{\text{male}}=475$, $n_{\text{female}}=299$), contraceptive use was 43% and 54%, respectively.⁴ The study disclosed that only 4% of girls using contraceptives chose IUDs compared to 22% consistent condom use, 15% oral contraceptives, 0.4% hormonal implants, and 31% hormonal injections (Table 1). The rare use of IUDs for contraception was confirmed during discussions in Nicaragua at various health facilities. Augsburg students spoke with a nurse at a public clinic, an epidemiologist in a private clinic, two providers at Centro de Mujeres

Acahual, and a nurse at Casa Materna.⁶⁻⁹ All sites agreed that IUDs are offered as part of patient education but are rarely utilized due to fear of infection or ulcers. Providers from all health facility discussions agreed that hormonal injections are the most popular form of contraception due to convenience. In addition, another source reported that utilization of contraception is increased for women who are married or in a stable relationship and decreased for women who lack reproductive independence.¹⁰

Limitations to Reproductive Health for Adolescents

I. Machismo

Adolescent pregnancy is preventable with modern contraceptive methods and adequate family planning; however, unwanted and unplanned pregnancy still exists. Limitations to reproductive health for adolescents in Nicaragua were analyzed in several published articles and in-person discussions at Nicaraguan health facilities. To identify possible barriers, one study in Ocotal, Nicaragua held three focus group discussions with 17 women. The discussions demonstrated conclusively that machismo is one key factor that prevents women from making autonomous reproductive decisions.¹¹ Machismo, similar to the English term sexism, is common in the city of Ocotal and is a key reason women do not seek contraceptive options. One woman speaks, “*there are men who are machistas [sexists] who do not like it if [their partner] plans and prefer [that their partner] is always pregnant, having child after child.*”¹¹ Two providers at Centro de Mujeres Acahual agreed that the presence of machismo is the largest contributing factor in the underutilization of contraceptive methods.⁸ Although women are aware of access to free contraception, many do not exercise their reproductive independence because they lack the support from their male counterparts. Often males believe if their partners seek contraceptives they are being promiscuous. If women do decide to utilize contraception, long term IUD use is

the least favorable method and hormonal injections are most favorable. Hormonal injection is the method of choice for adolescent females because they are able to receive monthly or trimonthly injections confidentially with little risk of their partner becoming aware of it and are able to discontinue the injections at any time.

II. Societal Criticism

Another limitation to reproductive health for female adolescents is criticism from others. Adolescent women are less inclined to seek reproductive healthcare at the central city clinic in fear of being recognized and judged by others in the community.¹¹ Women who seek contraception in private fear that community members may find out due to a breach in confidentiality by public clinic providers.⁸ Because community members criticize women who are sexually active at a young age, these young women do not seek contraception and become pregnant. This leads to an even harsher backlash of criticism from the community and their families. One source gave an example of a respected nursing student who became pregnant.⁷ Her family gave her the decision to either drop out of school or find her own home to live in. Although in the United States it is common to live elsewhere while attending school, this is rare in Nicaragua. Most families live in one home together until they are married and begin having children of their own. In this case, she decided to drop out of her nursing program to become a single mother to ensure she would have a home in which to raise her child.

III. Lack of Sexual Education

Lack of sexual education in schools is another obstacle for reproductive health in adolescents from Nicaragua. The Catholic church largely influences government policies, which include the total ban on abortion and lack of sexual education in schools.^{7,12} Providers at a private clinic and women's health center reported that the only education students receive regarding safe sex is in

biology. Sexual intercourse is taught in an anatomical context, whereas the critical subject matters of contraception and safe sex are not discussed.^{7,8} Due to government restrictions, the women's health center is no longer allowed in schools to provide education on contraception and reproductive health, as it had been in the past. Comparatively, a provider from a government-funded public clinic in Nicaragua stated that reproductive education provided by her clinic is allowed in public schools without restrictions from the government.⁶

IV. Fear of Infection from Intrauterine Devices

The main barrier to IUD implementation is the fear of infection, according to information obtained from clinical providers from a public clinic, a private clinic, and a women's health center.⁶⁻⁸ An epidemiologist from the private clinic added that there has been no research to determine if the fear of infection from IUD implantation is a result of true infection risk or if it is a negative stigma about the method. Previous research in El Salvador found similar explanations attributable to rare IUD use compared to other contraceptive methods.¹³ Patients did not opt to use IUDs due to rumors about their safety, inadequate education during patient counseling, and insufficient provider experience.

Another plausible aspect affecting the low rate of IUD use in Nicaragua is the type of IUD offered. In four health facilities offering IUD insertion, only the copper T (Paraguard) IUD was available for women.⁶⁻⁹ Paraguard has a higher incidence of vaginal bleeding and a longer lifespan when compared to hormonal IUDs such as Mirena. Women with a copper IUD may experience increased bleeding, while women with a hormonal IUD may only have irregular bleeding or commonly experience amenorrhea.¹⁴ In addition, the copper IUD is able to last up to 10 years while hormonal IUDs can last only up to 5.

V. *Poor Utilization of Health Facilities*

Health facility underutilization also leads to decreased contraception use in addition to unsafe home births. Health facilities are only utilized in 63% of births in the Matagalpa region.¹⁵ Interviews of Nicaraguan women in Matagalpa suggest that limitations to reproductive health present in a hierarchy of levels including individual, household, and community. One barrier to utilization of health facilities was financial concerns. Although prenatal services are free, women stressed issues with affording transportation to and from the clinic, missing work time, and prioritizing money for hospital stays and to support current family members. Other causes of decreased utilization were traditional or religious home birthing practices, previous adverse health experiences, and gender-power issues as mentioned with “machismo” relationships in Ocotal that result in lack of support from male partners.^{11,14} Overall, utilization of maternal healthcare services depends on individual preferences and past personal healthcare experiences, household support network and financial ability, and community level access regarding transportation, affordability of care, and communicable knowledge of care available for mothers.¹⁵

Maternal Outcomes of Adolescent Pregnancy

I. Anxiety and Depression

Outcomes of adolescent pregnancy pose significant risks to the mother and the fetus. Adolescence is a fragile time when females may be at risk for depression. Unplanned pregnancies can exacerbate these underlying psychological conditions. Due largely to socioeconomic differences, pregnant women in underdeveloped countries have an estimated one-in-three to one-in-five chance of developing a significant mental health problem compared to one-in-ten chance for pregnant women in developed countries.² One retrospective cohort study

found that the incidence of anxiety and depression during pregnancy for Nicaraguan women doubled that of Dutch women ($p < 0.001$). The incidence of anxiety and depression may be related to inadequate mental health resources, as only 9.6% of Nicaraguan pregnant participants stated professional psychological resources were accessible to them.²

II. Domestic Violence

Another contributor to adverse maternal outcomes for adolescents is violence. Extensive survey-based research in Nicaragua showed that women who reported unintended pregnancies had significantly higher exposure to violence and abuse from their partner and often had a low socioeconomic status ($p < 0.05$).⁵ Violence against women also commonly occurs in father-daughter relationships when the parent encounters realizations that his daughter is sexually active and/or secretly in relations with a male counterpart.¹¹ As one epidemiologist stated, “Although Nicaragua is ranked the second safest country in Central America, there still remains a huge issue with violence against women; Home is not the safest place.”⁷

III. Birth Outcomes Resulting from Total Ban on Abortion

The total ban on abortion, which began when Daniel Ortega was elected in 2006, can also lead to poor maternal outcomes.¹² Females do not have an option to abolish gravidity, even if the pregnancy puts a young mother at significant health risks including poor maternal weight gain, depression, preeclampsia, and preterm premature rupture of membranes.¹⁶ Because treatments for malaria, cancer, HIV/AIDS, and cardiac emergencies are considered to put the fetus at risk, health care providers will be penalized for providing medical care to pregnant patients with any of these conditions.³ Ironically, many women in Nicaragua agree with the total ban on abortion despite rape or young age due to the religious doctrine moral code of the Catholic Church.¹¹ Young women who need the most help are being left with little support and no choice in

abolishing an unwanted pregnancy.

Implementation of Reproductive Education and IUD for Contraception

I. Contraceptive Failure and Discontinuation Rates

Intrauterine device (IUD) contraception methods and reproductive education are postulated solutions to address barriers to reproductive planning and decrease pregnancies in Nicaraguan adolescents. Demographic and Health Survey data from 43 countries revealed that failure rates of long-acting reversible contraception (LARC) methods such as implants, intrauterine devices, and injectables were significantly lower than short-term resupply methods such as oral contraceptives and male condoms.¹⁷ Additionally, the discontinuation rate of IUDs is suggested to be lower than other methods, which is imperative to consider when offering a contraceptive option to high risk females who need protection longevity. One study in the United States found that the contraception method chosen by high-risk adolescents was the single strongest predictor of discontinuation, so method choice is critical for pregnancy prevention.¹⁸ Intrauterine device use was the most promising choice for continued use after 6 months of implementation. Out of 102 females in the study who initiated a contraceptive method, the continuation rates at 6 months were 20% depot medroxyprogesterone, 43% combined oral contraceptives, 17% patch and ring and 88% for IUDs ($p < .001$, Figure 1). These studies support the hypothesis that IUDs would prevent unwanted adolescent pregnancies in Nicaragua due to the lowest failure and discontinuation rates.

II. Patient and Clinician IUD Education

Educating clinicians about contraceptive options and patient counseling techniques is the first step necessary to increase IUD utilization. A randomized control trial studied the effect of implementing clinician education and patient education on total IUD uptake.¹³ Medical providers

were trained and presented with a checklist of counseling points to fulfill with each patient encounter. The goal of this strategy was to implement a standardized educational discussion with all adolescents seen in clinic. Interestingly, extensive teen counseling by medical practitioners had no significant impact on provider attitudes nor uptake of IUD use for patients. This suggests that increased education alone may not be sufficient to change personal beliefs about IUD contraception methods. Perhaps these beliefs are more complexly intertwined with Nicaraguan socioeconomics and culture.

III. Multifactorial Strategy for IUD Implementation

Adolescent pregnancy issues in Nicaragua have not gone unnoticed by the United States Agency for International Development (USAID). In contrast to the unchanged uptake of IUDs in the previous study, the Family Planning Expansion Collaboration put on by the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project gives hope to improve reproductive health of Nicaraguan adolescents. The USAID ASSIST Project is an organization funded by research and health administrations (World Health Organization) functioning to support health issues in developing countries.¹⁹ The 2009 initiative aimed to improve availability and uptake of family planning services, with specific goals to increase IUD availability and use, create more counseling opportunities for patients, and ensure women make an informed choice in their family planning. Clinics involved in the initiative followed best practices of previous health interventions and family planning protocols in an attempt to achieve desired goals. Promising results involved an increase of postpartum counseling before discharge from 76% to 92% and post-obstetric event IUD insertion from 1% to 8% from 2009 to 2011. With improved utilization of post-obstetric IUDs, adolescents who had a first birth could prevent future teen pregnancies. Despite increased education and accessibility of IUDs, this method remained secondary to other

contraception options. Patients' contraception choices included hormonal (40%), condoms (25%), IUDs (10%), and natural methods (10%). The successes of the Family Planning Expansion Collaborative brought awareness and resources to address adolescent pregnancy.

VII. Methods

The research topic of adolescent pregnancy in Nicaragua first surfaced from general internet search of current health issues facing the country. The prevalence of adolescent pregnancy is far greater than other countries in the world and peaked interest into further investigation. Background data on incidence of adolescent pregnancy in Nicaragua was found using the World Health Organization topic search of "adolescent pregnancy". This data was useful to compare prevalence of adolescent pregnancy of Nicaragua to other regions globally. Dynamed was utilized to draw general information on adolescent maternal and fetal risks. Pubmed internet database was used as the primary mechanism to further investigate point-of-care topics related to the hypothesis that IUDs and reproductive health education could reduce adolescent pregnancies. Specific key searches included "Nicaragua", "maternal outcomes", "adolescent pregnancy", "discontinuation and failure rate of contraceptive methods", and "barriers to reproductive health". Relevant studies included reviews, observational studies, and survey-type research. The book *Nicaragua: Living in the Shadow of the Eagle* by Walker and Wade provided copious information about Nicaragua history, culture, economics, and politics. Specifically, the legislature regarding the total ban on abortion was used to discuss maternal outcomes of adolescent pregnancy.

Finally, in-person interviewing of clinicians in Nicaragua gave support and credibility to current views on IUD use for adolescents seeking contraception. Providers from Centro de Mujeres Acahal, a public clinic in Managua, and a private clinic were questioned about the

incidence of adolescent pregnancy, incidence of IUD use as a contraception option, barriers to contraceptives, and if reproductive education was offered in schools, family, and community settings. The last in-person resource utilized was a discussion held at Casa de Materna, which is a facility that provides pregnant women coming from rural communities proper housing, food, education, preparation, and labor and delivery resources. The pregnant women were asked to share their age, how far away their home community was from the facility, and if this was their first pregnancy.

All resources coalesced into four key topics for the background portion of this paper: incidence of adolescent pregnancy and contraception methods, limitations to reproductive health for adolescents, maternal outcomes of adolescent pregnancy, and implementation of reproductive education and IUDs for contraception. Exclusion of electronic sources was based on concern for validity and quality. All resources utilized were peer reviewed and recently published. The method to each research study was analyzed for controls, patient selection process, and type of analysis. Selected studies were read through entirely to obtain relevant data for this research. Data from studies was succinctly incorporated into various portions of the background section to compare key issues surrounding adolescent pregnancy. In-person discussions were compared to evaluate the similarities and differences in response to questions regarding IUD use and reproductive health education. Discrepancies regarding reproductive health education in schools existed when questioning different facilities and is included in the discussion.

VIII. Discussion

Intrauterine devices for contraception and reproductive health education were postulated solutions to prevent adolescent pregnancy in Nicaragua. Evidence suggests that adolescent pregnancy puts the mother at risk for psychosocial issues including depression and domestic

violence. Not only do young women often lack the social support needed for a healthy pregnancy, but also financial resources and support after birth. Poor fetal outcomes are also more likely and include low birth weight and premature birth, among others. Due to these adverse outcomes of adolescent pregnancy, an effort towards prevention is needed. The issue is multifaceted however, and necessitates multiple solution strategies to successfully develop a targeted approach to pregnancy prevention. The research suggests that barriers to reproductive health have social, political, financial, and logistical origins. Conclusive evidence that IUD use specifically provides a solution to this complex issue simply does not exist.¹⁹

Barriers to reproductive health include machismo, societal criticism, lack of sexual education in schools, and lack of IUD knowledge. First, although women's health is gaining awareness in Nicaragua, the country's social culture is still largely male-centered. Young women may not seek reproductive health services due to judgement and influence of their partner or parent figures. Many studies conducted via survey also suggested that society criticizes the utilization of reproductive education in the young population. Although contraceptive methods may be offered to women of all ages according to risk, young women are hesitant to utilize these resources due to fear of societal rejection. Simply increasing accessibility and education about reproductive services may not be enough to overcome these cultural norms of machismo and religious beliefs.

Another barrier to reproductive health is sexual education. Contradicting responses about this topic arose from interviews at different health facilities in Nicaragua. A provider at a public clinic stated that reproductive health is included in public school education and that the clinic is able to provide education on the topics of contraceptives to many schools in the area. Conversely, providers from a private clinic and women's health center disagreed that

reproductive health education was included in any schooling. Instead, the only education students receive on sexual intercourse is the anatomically relevant biology of sex. The women's health center stressed concern that discussions on safe sex and contraceptive options are no longer allowed in any schools. The discrepancies between the responses given from the public provider versus the women's health center are likely due to care for clinic reputation or political manipulation at the public clinic. Speaking to several people in the community and our guide confirmed that reproductive education in schools does not exist to the extent that the public nurse stated. Moreover, private schools it is not allowed at all.

Another postulated barrier to contraception, specifically IUD use, is the type of IUD offered in Nicaragua. Every health facility that provided IUDs for women only offered the copper T (Paraguard) and did not offer hormonal (Mirena, Skyla, etc) devices. The side effect profiles and longevity of effectiveness for both types of IUDs is very different. Perhaps the cramping, bleeding, and longer effective timeframe of Paraguard attributed to negative stigma from women. Hormonal IUDs do not have heavy bleeding profiles and are available for shorter timeframes. When providers were questioned about the hormonal IUD options, few of the interviewees had knowledge of these devices.

That being said, IUD implementation with reproductive education has promising potential. Through a clinician-lens, adolescents at high risk can be educated on contraception options to bring awareness to their reproductive rights and encourage independent choices. Intrauterine devices are proven to have the lowest failure and discontinuation rates, likely due to the little effort needed after initial implantation compared to the inconveniency of meticulous daily doses for combined oral contraceptive pills. For adolescents that do not want to frequently attend clinic due to lack of transportation, time restraints around work and/or school, and fear of

being seen and criticized by community members, IUDs are an excellent option. However, there is varying evidence around the effectiveness of suggesting IUD use in Nicaragua. One study in Managua found no difference in provider attitudes or patient uptake of the IUD method after substantial effort to educate adolescents and expand IUD access.¹³ In contrast, the USAID Family Planning Expansion Collaboration executed a comprehensive approach across many facilities (8 hospitals and 8 clinics) and has seen tangible improvements in post-obstetric pregnancy prevention.¹⁴ Health care providers were trained in sterilization and IUD implantation techniques and each site was analyzed independently for what resources were needed. The balance of standardization of provider-patient services and counseling combined with addressing individual site struggles lead to an overall successful initiative. This further supports the concept that pregnancy prevention cannot and will not be accomplished through one method due to the complexity of the issue.

IX. Conclusion

Intrauterine device implementation and reproductive education are not exclusively effective methods to prevent adolescent pregnancy in Nicaragua. This comprehensive literature review has identified that barriers to adolescent reproductive healthcare access are multifaceted. However, clinic-level interventions were most successful when providers were trained in a standardized manner while integrating site-specific weaknesses. The USAID Family Planning Collaborative showed a promising increase of IUD utilization from 1% to 8% in two years. However, the research focused on post-obstetric patients and disregarded prevention of first-time mothers.

Recommendations to future adolescent pregnancy prevention include implementing best practices from the USAID initiative to family care visits in females reaching reproductive

potential. Currently, there is little acceptance of IUDs as a contraceptive option in Nicaragua due to fear of infection and lack of patient knowledge about the method. Further research on the risk of infection with IUDs would be helpful to determine if patients are opting out of IUD use due to rumor or if clinician implantation techniques must be improved to reduce true infection risks. Additionally, implementing the hormonal IUD instead of the copper IUD may be more appealing to adolescents due to minimal vaginal bleeding and shorter duration. On a larger scale, women advocacy groups could help inform legislatures of the need for reproductive education and increased access to adolescent groups. The total ban on abortion is still largely supported by most women in Nicaragua, so the focus must be on total prevention.

X. References

1. Department of Child and Adolescent Health and Development. World Health Organization. 2004. Adolescent Pregnancy: Issues in Adolescent Health and Development. http://apps.who.int/iris/bitstream/10665/42903/1/9241591455_eng.pdf. Accessed May 30, 2017.
2. Verbeek T, Arjadi R, Vendrik JJ, Burger H, Berger MY. Anxiety and depression during pregnancy in Central America: a cross-sectional study among pregnant women in the developing country Nicaragua. *BMC Psychiatry*. 2015; 15(6). doi: 10.1186/s12888-015-0671-y.
3. Campbell W and Jenkins AE. Adolescent Pregnancy in Nicaragua: Trends, Policies, and Practices. *International Handbook of Adolescent Pregnancy*. 2014; 465-483. doi 10.1007/978-1-4899-8026-7_25.
4. Decat P, Meyer SD, Jaruseviciene L, et al. Sexual onset and contraceptive use among adolescents from poor neighborhoods in Managua, Nicaragua. *The European Journal of Contraception & Reproductive Health Care*. 2014; 20(2): <http://www-tandfonline-com.ezproxy.augsburg.edu/doi/full/10.3109/13625187.2014.955846?scroll=top&needAccess=true>. Accessed June 3, 2017.
5. Salazar M and Sebastian MS. Violence against women and unintended pregnancies in Nicaragua: a population-based multilevel study. *BMC Womens Health*. 2014; 14. doi 10.1186/1472-6874-14-26.
6. Chief of Nurses. Centro de Salud Villa Libertad. Managua, Nicaragua. Discussion on clinic healthcare services and challenges. Translated by Augsburg Program Associate, Nicaragua, Juan Carlos Lopez. Center for Global Education and Experience, Augsburg University July 12, 2017.
7. Epidemiologist and president of the Nicaraguan Association of General Practitioners. Private clinic. Nicaragua. Discussion on Nicaraguan healthcare. July 14, 2017.
8. Nurse. Centro de Mujeres Acaual, Nicaragua. Discussion on contraception utilization and reproductive health education. Managua, Nicaragua. Translated by Augsburg Program Associate, Nicaragua, Juan Carlos Lopez. Center for Global Education and Experience, Augsburg University. July 11, 2014.
9. Nurse and 15 patients. Casa Materna of Matagalpa, Nicaragua. Discussion about facility services, patient profiles, and contraception. Translated by Augsburg Program Associate, Nicaragua, Juan Carlos Lopez. Center for Global Education and Experience, Augsburg University. July 18, 2017.
10. Lion KC, Prata N, Stewart C. Adolescent childbearing in Nicaragua: a quantitative assessment of associated factors. *Int Perspect Sex reprod Health*. 2009; 35(2). doi 10.1363/ifpp.35.091.09.

11. Luffy SM, Evans DP, Roachat RW. "Siempre me critican": barriers to reproductive health in Ocotol, Nicaragua. *Rev Panam Salud Publica*. 2015; 37(4-5):
http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1020-49892015000400009&lng=en&nrm=iso&tlng=en. Accessed June 1, 2017.
12. Walker TW and Wade CJ. Chapter 4: Recent history, part 2. In: *Nicaragua: Living in the Shadow of the Eagle*. 2011; 5th ed. Boulder, CO.
13. Hubacher D, Vilchez R, Gmach R, et al. The impact of clinician education on IUD uptake, knowledge and attitudes: results of a randomized trial. *Contraception*. 2006; 73(6): 628-33. doi 10.1016/j.contraception.2006.02.003.
14. Birth Control: Medicines to Help You. U.S. Food and Drug Administration: Free Publications. <https://www.fda.gov/forconsumers/byaudience/forwomen/freepublications/ucm313215.htm#LARC>. Updated September 9, 2016. Accessed July 26, 2017.
15. Lubbock LA and Stephenson RB. Utilization of maternal health care services in the department of Matagalpa, Nicaragua. *Rev Panam Salud Publica*. 2008;24(2): 75-84:
<https://www.ncbi.nlm.nih.gov.ezproxy.augsburg.edu/pubmed/19062598>. Accessed June 3, 2017.
16. Dynamed. Adolescent pregnancy.
<http://web.b.ebscohost.com.ezproxy.augsburg.edu/dynamed/detail?vid=1&sid=c75997f5-0b76-4a3e-b8b0-f533168c7f78%40sessionmgr103&hid=118&bdata=JnNpdGU9ZHluYW11ZC1saXZlJnNjb3BIPXNpdGU%3d#AN=361084&db=dme>. Updated May 30, 2017. Accessed June 1, 2017.
17. Polis CB, Bradley SEK, Bankole A, et. al. Typical-use contraceptive failure rate in 43 countries with Demographic and Health Survey data: summary of detailed report. *Contraception*. 2016; 94(1): 11-17. doi 10.1016/j.contraception.2016.03.011.
18. Maslyanskaya S, Coupey SM, Chhabra R, Khan UI. Predictors of Early Discontinuations of Effective Contraception by Teens at High Risk of Pregnancy. *J Pediatr Adolesc Gynecol*. 2016; 29(3): 269-75. doi 10.1016/j.jpag.2015.10.014.
19. USAID Assist Project. *Nicaragua: Family Planning Expansion Collaboration*. 2011.
<https://www.usaidassist.org/resources/nicaragua-family-planning-expansion-collaborative>. Accessed June 4, 2017.

XI. Appendix A

Table 1: Contraceptive method choice among sexually active adolescents (with and without regular partner)

Table 4 of 6
Table 4 Contraceptive use among sexually active adolescents.

	Adolescents who have a regular partner		Adolescents who do not have a regular partner	
	Girls (N = 232)	Boys (N = 305)	Girls (N = 67)	Boys (N = 170)
Current contraceptive use	138 (59%)	155 (51%)	24 (36%)	51 (30%)
Consistent use of condoms	51 (22%)	84 (27%)	19 (28%)	38 (22%)
Respondent or partner currently uses				
Oral contraceptives	35 (15%)	68 (22%)	4 (6%)	–
Intrauterine devices (copper T)	9 (4%)	5 (2%)	2 (3%)	–
Hormonal implants	1 (0.4%)	2 (0.7%)	0 (0%)	–
Hormonal injections	71 (31%)	37 (12%)	3 (4%)	–

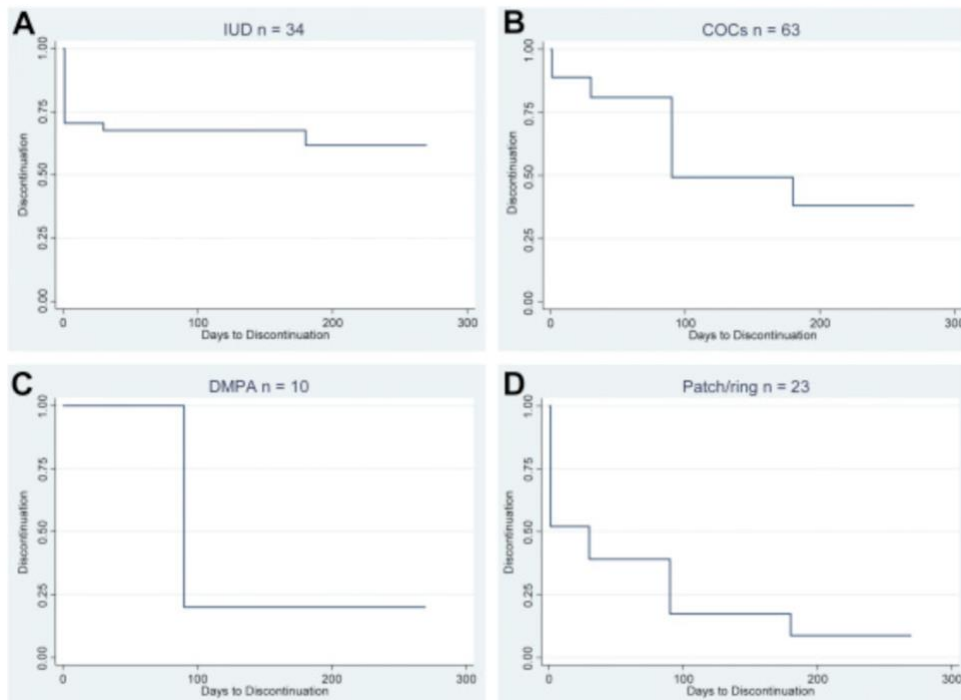


Figure 1: United States study of adolescent contraceptive method discontinuation rates. “Kaplan-Meier curves show timing of discontinuation for each contraceptive method over a 6-month time period (N = 130). Noninitiation of a method is graphed as discontinuation on day 1. (A) IUD; (B) COCs; (C) DMPA; and (D) patch and/or ring. COC, combined oral contraceptive pill; DMPA, depot medroxyprogesterone acetate; IUD, intrauterine device; Patch, transdermal patch; ring, intravaginal ring.”



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