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Medically Accurate Evidence-Based Sex Education and Abstinence-Only Sex Education: Impact on Teen Pregnancies in the United States

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**Medically Accurate Evidence-Based Sex Education and Abstinence-Only Sex
Education: Impact on Teen Pregnancies in the United States**

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November 16, 2022

Abstract

The U.S. has funded abstinence-only programs to combat pregnancy rates for a long time. With numerous factors contributing to teen pregnancies, there have been a lot of ways that people have decided to try to decrease the number of teen pregnancies. For example, schools have either decided that they intend to fully educate their teenage students using medically accurate evidence-based sex education or come from a more conservative approach and give abstinence-only education. The objective of this investigation is to identify whether evidence-based sex education or abstinence-only sex education is more effective at combating teen pregnancy and abortion rates. This investigative thesis utilizes a literature review of six primary articles to determine whether either method is more effective than the other. By examining the efficacy of the type of sex education provided to teenagers, we can thus determine which method should be implemented in more schools to identify interventions that school nurses can perform to help control teen pregnancy rates and the potential for abortion. A study for further research is proposed.

Keywords: Sex education, abstinence, teen pregnancies, potential abortion

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Introduction

Sex education is implemented in a variety of ways in the United States. Sex education is, by definition, the teaching of sexuality, behaviors of sexuality, and sexual intercourse. And through these teachings, there is a direct tie between what teenagers learn from sex education and their perceptions and actions later, such as abstaining from sex, using a condom, or partaking in more risky sex practices. As healthcare professionals, we need to recognize the gaps in knowledge and the result of those gaps in knowledge manifested into decisions that kids make later in their lives. The purpose of this literature review is to identify the impact that evidence-based sex education and abstinence-based sex education have on U.S. teenagers, as well as identify other successful methods that have decreased teen pregnancy rates and teen abortion rates. A study for further research will also be proposed.

Problem Statement

Sex education is often a topic that both students and teachers do not talk about enough because of a variety of reasons, such as personal biases or social stigma. Teenagers are incredibly susceptible to what adults are telling them and what education they receive. ” According to Santelli (2007), “the United States has had the highest rate of adolescent pregnancy of any of the world’s developed nations.” (p.1) And while there have been a variety of actions to try to combat that, such as making contraception more easily obtainable through online providers, teen pregnancy remains still a problem in the United States (U.S.). The U.S. government also promotes abstinence-only-until-marriage education through \$175 million in donations to organizations that have guidelines to “withhold information on contraception and condom use” (Ott, 2018). And while the government is donating money to these organizations, whether abstinence-only education has any impact on having teenagers choose to abstain remains in the

air, as well as whether abstinence-only education decreases adolescent pregnancy rates. It is extremely crucial to determine what kinds of sex education are most helpful in lowering teen pregnancy rates because education provides teens with the ability to make their own choices with their sex practices, which they will do later. The rate of teen pregnancy is alarming, and we must work to determine the types of sex education that are most effective so that we, as healthcare professionals, can do our part in educating our patients and their families.

Research Question

In teens and adolescents who attend primary, middle school, or high school in the U.S., how does medically accurate evidence-based sex education compared to abstinence-only sex education affect teen pregnancies?

Literature Review

This literature review was explored using numerous databases, such as the Dominican University of California library and PubMed. Seven research articles were selected based on the topic of evidence-based sex education and abstinence education. Keywords used to find these research articles were abstinence sex education, comprehensive sex education, teen pregnancy, and education, and abstinence and teen pregnancy.

The literature review portion of this paper will be examined in four categories: forms of abstinence sex education and its impact on teen pregnancies, risk reduction vs abstinence education, abstinence sex education vs comprehensive evidence-based sex education and their impact on teen pregnancies, as well as primary prevention techniques and their impact on unintended pregnancies. (See the appendix at the end for the literature review table for the summary of each article.)

Forms of Abstinence-only Sex Education Impacts

A study by Stanger-Hall (2011), conducted a secondary analysis using primary data to determine whether abstinence-only education (particularly in states that did not have sex education laws) was impactful in reducing U.S. teen pregnancy rates. Twenty-one of 48 states (all U.S. states except North Dakota and Wyoming) promoted abstinence-only education in their 2005 state laws and/or policies (level 3), seven states emphasized abstinence education (level 2), eleven states covered abstinence as part of comprehensive sex education, and nine states did not mention abstinence at all (level 0). (Stanger-Hall, 2011) .

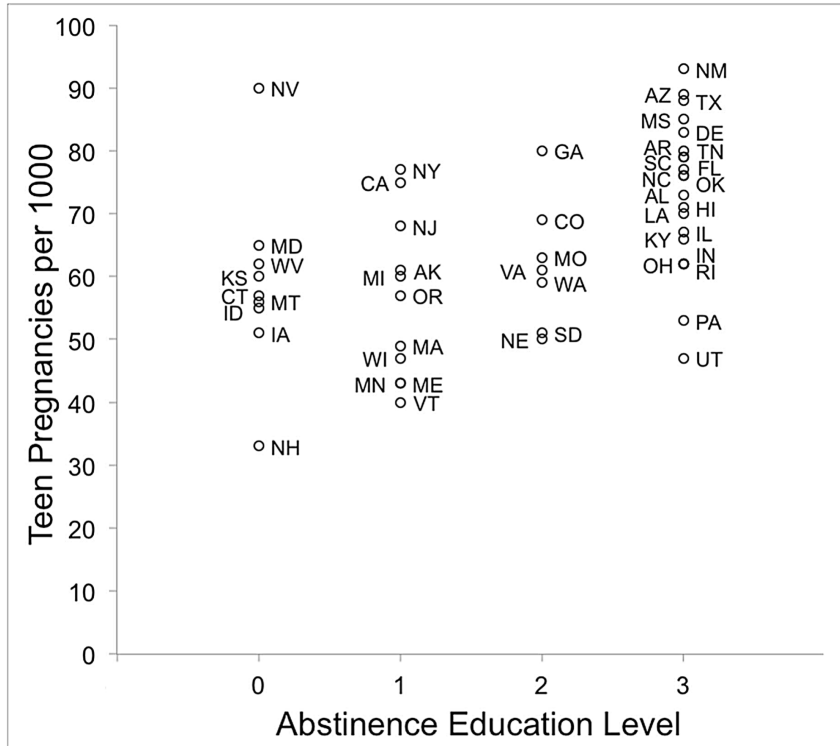


Figure 1. Abstinance education level prescribed in 2005 state laws and policies (Wyoming and North Dakota not included). Reused from authors with permission. From Stanger-Hall, K. F., & Hall, D. W. (2011). *Abstinance education level prescribed in 2005 state laws or policies*. National Library of Medicine. Retrieved October 26, 2022.

The researchers rated all 50 states' 2005 sex education laws and policies from level 0 (abstinance not mentioned) to level 1 (abstinance covered) to level 2 (abstinance provision in law) to level 3 (abstinance stressed) (Figure 1). Next, they retrieved data on teen pregnancy, birth, and abortion rates from 48 states. To account for ethnic composition, they determine the proportion of three major ethnic groups (black, Hispanic, white) They retrieved birth and abortion rates and calculated teen pregnancy rates based on reported teen birth and abortion rates plus estimated miscarriage rates in order to assess if there was a significant correlation between

the level of abstinence education (Figure 2). Using a correlational method, they looked at abstinence education, median household income, educational attainment, and ethnic differences to determine it (Stanger-Hall, 2011).

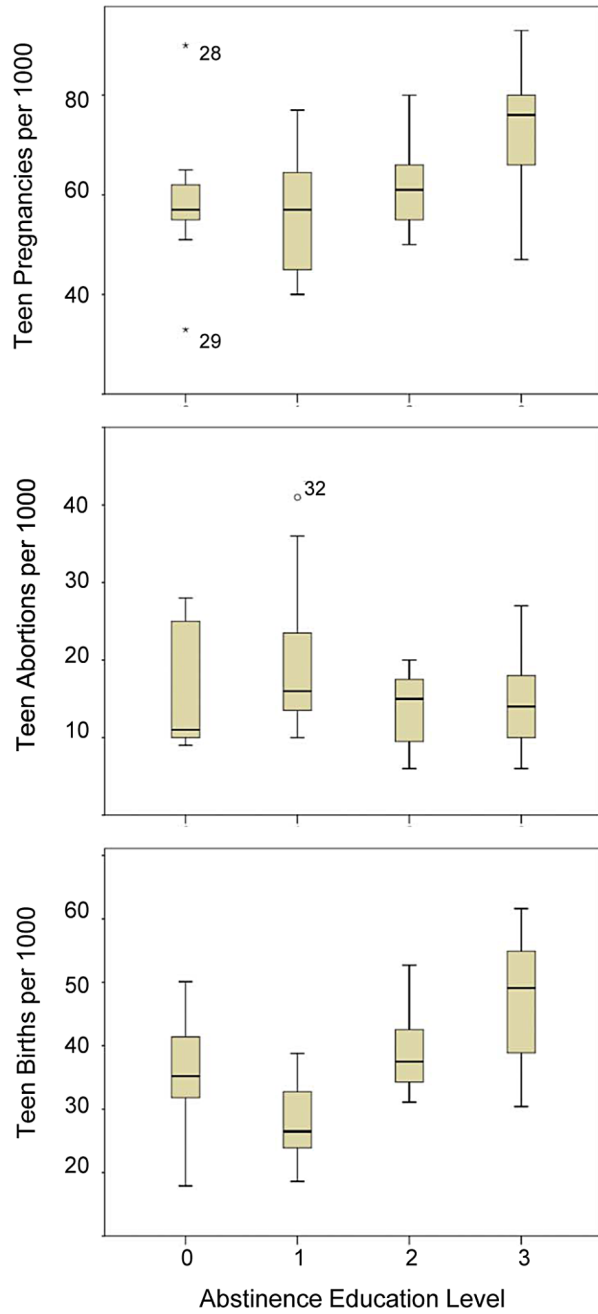


Figure 2. Abstinence education level prescribed in 2005 state laws and policies (Wyoming and North Dakota not included). Reused from authors with permission. From Stanger-Hall, K. F., & Hall, D. W. (2011). *Abstinence education level prescribed in 2005 state laws or policies*. National Library of Medicine. Retrieved October 26, 2022.

As measured by the number of high school graduates taking the SAT in 2005/2006, the researchers found no significant correlation between abstinence education and statewide high school education. Education was correlated with teen abortion rates but not correlated with teen pregnancy rates. The researchers' ethnic composition analysis focused on the white black, and Hispanic communities. Despite differences in teen pregnancy rates across racial groups, abstinence education levels were positively associated with teen birth rates. (white: $\rho=0.439$, $p=0.002$; black: $\rho=0.328$, $p=0.028$; Hispanic: $\rho=0.461$, $p=0.00$) (Stanger-Hall, 2011)

In their study, researchers found that teen pregnancies and births were positively correlated with the degree (0, 1, or 2) of sexual education given in that state after they accounted for other factors such as educational attainment, Medicaid waivers for family planning, socio-economic status, and ethnic composition. Using a correlational method, they found that the level of abstinence education was positively correlated "with both teen pregnancy (Spearman's $\rho = 0.510$, $p=0.001$) and teen birth ($\rho=0.605$, $p<0.001$) rates." (Stanger-Hall, 2011). They found that teens in states that have abstinence-only sex education do not necessarily indicate abstinence behavior. Those teens were more likely to become pregnant.

Risk Reduction vs Abstinence Education

Three randomized control trials were conducted in 15 urban middle schools from 2006 to 2010 to determine whether two theory-based, multimedia sexual education programs could delay sexual initiation. There were 1,258 seventh graders, mostly African American and Hispanic, who were followed up until ninth grade (Markham, 2012, p.1). A multi-attribute randomization protocol was used to assign 10 schools to either RA (risk avoidance) or RR (risk reduction), and the remaining 5 schools were the control. RA and RR programs were developed through a systematic design process. The interventions were intended to have a positive impact on healthy

dating relationships and delayed sexual initiation. Twelve lessons in seventh grade were followed by 12 more in eighth grade, which included classroom activities and journaling. Seventeen RR programs were the same as the RA program, except the remaining 6 more were added to the RA lessons to stress the abstinence-until-marriage belief vs the abstinence-until-older-and-ready belief.

The RR program, with its abstinence-until-older belief, promoted self-respect and responsibility and even included activities regarding condom and contraceptive use. Seventh graders who acknowledged that they were sexually experienced received education on how to use a condom and what contraception was, while all eighth graders received activities on how to correctly use a condom and the benefits/harms of various contraceptives.

In the ninth grade, 1,333 students completed surveys (a 23.5% attrition rate). A total of 1,258 surveys were analyzed after 75 students' surveys were excluded due to missing or inconsistent information. Researchers found that RA did not significantly delay sexual initiation (oral, vaginal, anal) compared to control conditions when generalized linear models were used. When comparing students in the RR and control conditions, RR students were about 35% less likely to initiate any type of sex. The researchers found that the "RA program positively affected condom-related psychosocial outcomes, including condom use self-efficacy and intentions, whereas the RR intervention positively affected beliefs about abstinence-until-marriage."

(Markham, 2012) The RR program was found to have reduced unprotected sexualintercourse.

While RA students delayed their sexual debuts and initiated vaginal sex significantly, RR students reported "more reasons for not having sex, increased intentions to remain abstinence through high school, increased knowledge of condom use, self-efficacy, and intentions" relative to control. (Markham, 2012, p.4) In parallel, RA students had developed strong beliefs about

abstinence-until-marriage. The researchers acknowledged that both the RR and RA programs may positively influence early adolescents.

The researchers acknowledged the following limitations: self-reported data being unreliable as it is susceptible to being over/under-reported, parental consent was required to be entered into this study (meaning youth most at risk may have been excluded), and the study was conducted in only one school district (which means that these findings may be only applicable to other urban areas comparable in size).

In the research article “Sexual Risk Avoidance and Sexual Risk Reduction Interventions for Middle School Youth: A Randomized Controlled Trial” by Helen Chin et. al (2012), a group of authors conducted a meta-analysis (quantitative) on whether abstinence education (group-based behavioral interventions) and comprehensive risk reduction (group-based behavioral interventions). In a study, group-based interventions that address sex and sexual behavior openly were investigated for their ability to reduce unplanned pregnancies and other unintended outcomes. In their study, seven key outcomes were examined: current sexual activity, frequency of sexual activity, number of partners, frequency of unprotected sexual activity, use of protection, pregnancy, and sexually transmitted infections (STIs). The researchers found 6579 studies in total. There were 66 studies of comprehensive risk reduction and 23 studies of abstinence education that assessed adolescents' sexual behaviors and their educational outcomes. Additionally, they acknowledged other variables such as gender, virginity status, race/ethnicity, intervention characteristics such as setting/deliverer/targeting, and study characteristics such as comparison group design.

The researchers conducted a meta-analysis by transforming the data into an odds ratio (OR) effect that “estimates to place effect estimates for each study on a common scale for

meta-analysis.” (Chin, et. al 2012, p.3) Univariate analyses on each of the moderate variables were conducted as well as ORs and confidence intervals (CIs) to calculate the category of the moderator variable.

The researchers found that group-based comprehensive medically accurate sex education was found to be effective at reducing adolescent pregnancy, human immunodeficiency virus (HIV) and STIs, while group-based abstinence education had inconsistent findings across studies that varied by how the study was conducted and followed up.

Limitations include that fewer abstinence studies were selected for this study based on the availability of studies conducted compared to the number of studies that were available for comprehensive risk reduction sex education.

Abstinence vs Comprehensive Sex Ed

In a study conducted by Monica Silva (2002) titled “The effectiveness of school-based sex education programs in the promotion of abstinent behavior: a meta-analysis”, she conducted a meta-analytic review of school-based sex education that promoted abstinent behavior. Her research focused on finding as many studies as possible that measured abstinent behavior after the implementation of sex education programs. For this meta-analysis, four criteria were used: interventions had to be aimed at normal adolescent populations in public or private schools in the U.S., they had to be experimental or quasi-experimental, published recently, and they had to be peer-reviewed. To avoid situations like the AIDS epidemic that may have altered human behavior during those times, studies had to be published between January 1985 and July 2000. D-STAT software was used to analyze effect sizes. Categorical and continuous univariate tests were run. Mean and pooled standard deviations were used to calculate effect sizes. The

researcher narrowed it down to only 12 abstinence research studies that could be included in her review.

The researcher found that sex reduction interventions had no significant effect- regardless of whether the program was abstinence-promoting or comprehensive medically-accurate sex. Interventions that included parental intervention and cooperation appeared to have higher efficacy than the type of education that students were receiving. She also noted that there was a lack of information on primary research literature and that authors of such primary articles often did not control for other factors that may have affected, such as “academic performance, career orientation, religious affiliation, romantic involvement, number of friends who are currently having sex, peer norms about sexual activity and drinking habits.” (Silva, 2002) Limitations of the study include how despite a meta-analysis being a highly regarded form of research, there is a limitation due to the quality of primary research.

In a research meta-analysis “Effectiveness of School-Based Teen Pregnancy Prevention Programs in the USA: a Systematic Review and Meta-Analysis” by Marseille et. al (2018), the researchers wanted to examine and determine the effectiveness of a variety of studies based on three secondary outcomes: condom use, contraception use, sexual initiation. Specifically, their study examined U.S. school-based interventions that measured pregnancy as an outcome as part of a systematic review and meta-analysis. They assigned one group to “RCT” and the other to “non-RCT” and included both in the same pooled analysis. They conducted research doing a range of keywords and MeSH terms. They furthermore studied bibliographies and contacted authors of included studies and other experts. Studies that were included in the meta-analysis had to be conducted in elementary, middle, or high schools that included a control condition and an intervention. Their searches revealed 4867 citations including 94 in gray literature.

The researchers of this meta-analysis established that only interventions with multiple components (such as educational and contraceptive-promoting) had a significant effect on preventing pregnancy. There was both no effectiveness in abstinence-only programs as well as no pattern of effectiveness in comprehensive sex education. They further acknowledged that their review is limited as they excluded studies that measured teen pregnancies as its secondary outcome, which could have produced a biased sample of studies. While their current analysis is comprehensive, they speculate that true randomization is very difficult to achieve in the nature of school-based programs to conduct a thorough and comprehensive primary study.

Their “four pooled RR results that showed statistically significant reductions in pregnancy, from a total of 30 unique pooled comparisons, are too few to test hypotheses regarding the correlates of program effectiveness” (Marseille et. al, 2018). In other words, they believe that the limited evidence at present does not support a hypothesis that there have been reductions in pregnancy risk and outcomes with school-based pregnancy prevention programs.

Primary Prevention Techniques’ Impact on Unintended Pregnancies

In “Interventions for preventing unintended pregnancies among adolescents,” the researchers wanted to assess the primary prevention (faith, community, home, schools, clinic) techniques and their effects on unintended pregnancies among adolescents. Using the Cochrane Fertility Regulation Group Specialized trial register, CENTRAL, MEDLINE, EMBASE, LILACS, Social Science Citation Index, Dissertation Abstracts Online, PsycINFO, CINAHL, POPLINE, and the Gray Literature Network, they searched for all relevant studies up to November 2015. (Oringanje, 2016) The authors included cluster randomized control trials (RCTs) to evaluate any interventions that were put in place to increase knowledge and attitudes relating to unintended pregnancies for kids and adolescents aged 10 to 19 year olds.

The researchers included 53 RCTs that enrolled 105,368 adolescents. “Eighteen studies randomized individuals, 32 randomized clusters (schools (20), classrooms (6), and communities/neighborhoods (6))” (Oringanje, et. al, 2016, p.4). They found that educational interventions were unlikely to significantly delay the initiation of sexual intercourse, but significantly increased reported condom use. However, it was not clear if educational interventions, regardless of whether it was comprehensive or abstinence-focused, had any effect on unintended pregnancy as the studies included did not report on subsequent pregnancy rates. Contraceptive-promoting interventions, such as educating adolescents about the uses, types, and benefits of contraception, had negligible difference in the risk of unintended first pregnancy compared to the control group. However, the use of contraception was significantly higher in this group compared to the control group. Ultimately the authors concluded that their results showed that multiple components of educational and contraceptive-promoting interventions had the highest outcome of lowering the risk of unintended pregnancy among adolescents significantly compared to other singular intervention.

The research article titled “Explaining Recent Declines in Adolescent Pregnancy in the United States: The Contribution of Abstinence and Improved Contraceptive Use” by John S. Santelli et al (2007), is a secondary study using primary data, aimed to explore the relative contributions of declining sexual activity and improved contraceptive use to the recent decline in adolescent pregnancy rates in the U.S. The study uses data from 1991 to 2000 pregnancy and birth rates from the National Center for Health Statistics (NCHS) to compare measures of overall pregnancy risk with actual pregnancy rates and found that the contraceptive risk index declined “34% overall and 46% among adolescents aged 15 to 17 years” (Santelli et al, 2011, p.4). The researchers created two indexes for this study: the contraceptive risk index, a weighted-average

contraceptive use/non- use pregnancy risk index, and the overall pregnancy risk index. The contraceptive risk index is the score that the researchers calculated using the basis of the 2 most effective contraceptive methods she had used at her most recent sexual intercourse. The overall pregnancy risk index is calculated with the impact of changes in sexual activity and contraceptive use. They also took into account age and race-specific changes over time in the overall pregnancy risk index value.

The researchers noted that there 86% of the decrease in the percentage of sexually active young women among 15-19-year-olds was due to contraceptive use. 15-17-year-olds had a respective 23% decrease. All of the changes in pregnancy risk among 18- and 19-year-olds were the result of increased contraceptive use.

The researchers concluded that the declining adolescent pregnancy rates in the U.S. were primarily due to improved contraceptive use. Decreased sexual activity was responsible for about one-fourth of the decline in 15-17-year-olds. Increased availability and use of modern contraceptives in the 21st century have been the factor that has most impacted adolescent pregnancy rates. The study relied primarily on adolescents reporting their sexual health history/activities, which is susceptible to being under/over-reported. They also found that there was instability in the National Survey of Family Growth (NSFG) data, compiled by the NCHS, for Hispanic adolescents because the decline in sexual experience among Hispanic teenagers was much larger than in other groups. It was found out later in 1988, 1995, and 2002 NSFG that they had estimated sexual experiences for Hispanic women aged 15 to 17 years in previous years.

Literature Review Conclusion

According to data collected during this literature review, there is a lack of adequate primary literature to conclude whether or not abstinence-based sex education and/or

comprehensive medically-accurate sex education impact teen pregnancy rates. Further research is needed to study the effects of education in schools and their impact on pregnancy outcomes. Compared to Stanger-hall, there were more pregnancies in people who had abstinence-only education while Silva claimed there was no significance regardless of the type of education.

Research on abstinence-only education and comprehensive medically-accurate sex education can be used to solidify what schools should do to best set up their students with the appropriate tools they need to abstain from sex or to have safe sex. Most importantly, with abortion being a primary concern in 2022, it is safe to say that this topic is crucial to understand as teen pregnancy rates contribute directly to abortion rates.

Theoretical Framework

The UNESCO (United Nations Educational, Scientific, and Cultural Organization) published an updated “International Technical Guidance on Sexuality Education” with guidelines to include comprehensive medically accurate sex education to equip adolescents with adequate knowledge, skills, values, and attitudes that help them develop empowering sexual relationships with one another as well as realize how their choices can affect their well-being and people around them. (date) They believe that giving young people age-appropriate reliable information reduces risky sexual behavior.

A theoretical framework that presents the science behind medically-accurate sex education was presented in the low-income communities of Los Angeles. Viewing sex education as something that was a “rights-based approach, which seeks to unify issues of sexuality, human rights, and gender to promote healthy sexual development.” (Constantine et al, 2015, p.1) The rights-based framework acknowledged the fundamental rights that adolescents have to sexual health information and services. This theory goes well beyond the goals of sexuality to prevent

diseases and pregnancy, but rather it tells adolescents about sex in a sex-positive way regarding gender norms, relationship power, sexual orientation, and body positivity. In doing so, adolescents become more confident and self-determinant in choosing the choices that are right for them.

Proposal for Future Study

It is extremely critical to determine what types of sex education are the most beneficial for reducing teen pregnancy rates. The review of the literature determined that further research is needed to be done in order to conclude what schools should be having their teachers and school nurses be teaching the next generation of students. The need for more primary studies to determine the effects of sex education is essential and there is a current lack of primary studies to evaluate this. The theoretical framework mentioned previously in this proposal stated that comprehensive medically-accurate sex education would equip students to make their own choices at present or in the future.

The initial research question being investigated for the literature review was: In teens and adolescents who attend primary, middle school, or high school in the U.S., how does medically accurate evidence-based sex education compared to abstinence-only sex education affect teen pregnancies?

This author hypothesizes that students receiving medically-accurate sex education should lower teen pregnancies when compared to its counterpart, abstinence-only sex education. The primary aim of this study is to determine what type of sex education students think will reduce teen pregnancies. The new question that arises is: What are the perspectives of teenagers themselves on the type of sex education that will be most beneficial in reducing teen pregnancy rates?

Research Design

This study will be a qualitative study using a convenience sample. Inclusion criteria will be: Students who are currently enrolled in a U.S. high school; who live in the U.S.; who have participated in a sex education class (currently or in the past); who are willing to participate; are at least 16 years old; and, if younger than 18-years old, who have parents/guardians willing to consent. The study will implement short interviews conducted with the high school students who live throughout the United States. The interviews will be conducted on Zoom and assess what students think is more important and effective to them to prevent them from getting pregnant. This study is designed to be implemented in high schools for teenagers aged 16 years and older from different parts of the U.S.

Ethical Considerations

The Dominican University of California Internal Review Board (IRB) will review the study for ethical considerations and will need to grant permission to conduct the study to protect the participants who partake in the research. Students will also be granted the following ethical considerations: voluntary participation, informed consent/assent, anonymity, confidentiality, results communication, and potential for harm. No one except the researchers will be allowed to know their identity. All information will be kept private, and safely stored on a password protected computer.

Recruitment

Recruitment for this study will be broadcast on social media (Twitter, Instagram, Facebook) to garner participation from various states and groups of people. To identify students who meet the inclusion criteria, a short screening questionnaire will be provided. To be included in this study, students will need to be currently enrolled in high school, aged 16 or older, and are

currently taking or have taken a sex education course. After students are identified as being eligible based on their initial screening questionnaire responses and have chosen to participate in the virtual interview on Zoom, they will be sent a video explaining the full scope of the study and consent forms with complete assurance of confidentiality. For those who are 18 years old and above, a consent form will be provided for the potential participant. For those who are under the age of 18 years, one consent form for the parents and one assent form for the adolescent will be provided. An online signature for consent must be obtained from the parents. An assent form explaining the study will need to be signed by the adolescent. Documentation of explanation of procedure for the assent form also will be signed by the researcher.

A total of 250 students will be selected for an interview and there will be a limit of five students per state. If more than five students in one state sign up, then they will be randomly selected for participation. The study aims to recruit and include participants from every U.S. state. Recruitment will take place continuously until at least one participant from each state is enrolled.

Study Methods

For the interview, students will be asked what grade they are in, how old they are, their state and in which/region they are located, whether they live in a rural, suburban, or urban environment, what their sex education class taught them, their sexual practices, their sexual history, and what type of education they think is the most effective at preventing pregnancies. They will be given time to also speak about their thoughts on what they would like to know about sexual health, if their sex education class was effective, and why they think unplanned teen pregnancies occur.

Interviews will take place at a time convenient for the participant and the participant will be asked to find a quiet secure place to join the researcher on Zoom. The researchers will take notes during the meeting, but interviews will not be videotaped to help students feel comfortable and to ensure confidentiality. Interviews will be scheduled for 45 minutes each. Two research assistants will be trained to use semi-guided interview questions to conduct the interviews along with the researcher. Interviews will take place over the course of six months.

After the responses have been collected, it will be analyzed using a content analysis. The researchers will meet to discuss the responses with the aims of organizing words and phrases into categories. From the categories, common themes will be agreed upon as to what students in the United States think is most effective to them.

Conclusion

From the literature review, I found that the current research on sex education is inadequate. This proposed study is intended to gain insight on students' perceptions and show schools, nurses, healthcare professionals, and the community what the students think may be most effective at reducing teen pregnancies. This is particularly important to nursing to prevent unwanted teen pregnancies, and potentially reduce the need for abortions and disruptions to adolescent lives.

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Appendix

Authors/Citation	Purpose/Objective of Study	Sample - Population of interest, sample size	Study Design	Study Methods	Major Finding(s)	Strengths	Limitations
Chin, H. B., Sipe, T. A., Elder, R., Mercer, S. L., Chattopadhyay, S. K., Jacob, V., Wethington, H. R., Kirby, D., Elliston, D. B., Griffith, M., Chuke, S. O., Briss, S. C., Ericksen, I., Galbraith, J. S., Herbst, J. H., Johnson, R. L., Kraft, J. M., Noar, S. M., Romero, L. M., Santelli, J., ... Community Preventive Services Task Force (2012). The effectiveness of group-based comprehensive	To determine whether group-based interventions that openly address sex and the sexual behaviors of adolescents can reduce the incidence of unplanned pregnancy and other unintended outcomes, such as HIV and STIs.	There were a total of 6579 studies that were found. 66 studies of comprehensive risk reduction and 23 studies of abstinence education were assessed that addressed the sexual behaviors of adolescents and the outcomes of their education	Meta-analysis (quantitative) using a total of 89 studies	The study was done using meta-analyses on seven outcomes: sexual activity frequency, number of sex partners, use of protection (i.e. condoms, contraception), pregnancy, STIs, and current sex activity.	Group-based comprehensive medically accurate sex education was found to be effective at reducing adolescent pregnancy, HIV and STIs, while group-based abstinence education had inconsistent findings across studies that varied by how the study was conducted and followed up.	This is a meta-analysis that increases the generalizability of the study that incorporates a lot of results from various studies.	Less abstinence studies were selected for this study based on availability of studies conducted compared to the amount of studies that were available for comprehensive risk reductions education

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e risk-reduction and abstinence education interventions to prevent or reduce the risk of adolescent pregnancy, human immunodeficiency virus, and sexually transmitted infections: two systematic reviews for the Guide to Community Preventive Services. <i>American journal of preventive medicine</i> , 42(3), 272–294. https://doi.org/10.1016/j.amepre.2011.11.006							

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<p>Markham, C. M., Tortolero, S. R., Peskin, M. F., Shegog, R., Thiel, M., Baumler, E. R., Addy, R. C., Escobar-Chaves, S. L., Reininger, B., & Robin, L. (2012). Sexual risk avoidance and sexual risk reduction interventions for middle school youth: A randomized controlled trial. <i>Journal of Adolescent Health, 50</i>(3), 279–288. https://doi.org/10.1016/j.jadohealth.2011.07.010</p>	<p>To evaluate the efficacy of two, theory-based, multimedia, middle school sex education programs in delaying sexual initiation</p>	<p>Three-armed, randomized controlled trial comprising 15 urban middle schools; 1,258 predominantly African American and Hispanic seventh grade students followed into ninth grade.</p>	<p>Quantitative and Qualitative Mixed method based on interviews and questionnaires.</p>	<p>The risk avoidance (RA) promoted abstinence-education guidelines and the risk reduction program (RR) emphasized abstinence and included computer-based condom skills-training.</p>	<p>The RR program positively affected sexually inexperienced and experienced youth among Hispanics and had mixed effects among sexually experienced youth.</p>	<p>Focused on a mostly underrepresented population in other studies using variations of abstinence-only education. Sample size was relatively large.</p>	<p>This study was conducted in one urban area only, limiting generalizability. Reliance on accurate self-reports from adolescents.</p>
<p>Marseille, E., Mirzazadeh,</p>	<p>To examine and determine the</p>	<p>Imported all resulting records</p>	<p>Systematic review and</p>	<p>Assigned one group</p>	<p>Educational -only</p>	<p>Screening for inclusion of</p>	<p>Risk of bias is high.</p>

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<p>A., Biggs, M. A., P Miller, A., Horvath, H., Lightfoot, M., Malekinejad, M., & Kahn, J. G. (2018). Effectiveness of School-Based Teen Pregnancy Prevention Programs in the USA: a Systematic Review and Meta-Analysis. <i>Prevention science : the official journal of the Society for Prevention Research</i>, 19(4), 468–489. https://doi.org/10.1007/s11121-017-0861-6</p>	<p>effectiveness of a variety of studies based on three secondary outcomes: condom use, contraception use, sexual initiation.</p>	<p>into EndNote and removed duplicate records. Two reviewers screened citations. Two more reviewers examined the full text of each article to determine which satisfied inclusion criteria. 21 studies were included.</p>	<p>meta-analysis focused on specific effect of U.S. school-based interventions among programs that measured pregnancy as its outcome</p>	<p>to “RCT” and the other to “non-RCT” and included both in the same pooled analysis. Used a range of keyword and MeSH terms. Reviewed study bibliographies and contacted authors of included studies and other experts.</p>	<p>components had no statistical significant effect at preventing pregnancy. Interventions with multiple components (educational and contraceptive promoting) had significant effect in preventing alone. reviewer reconciled any disagreement.</p>	<p>articles was extremely rigorous. There was a bias assessment done.</p>	<p>Randomization methods were poor in one RCT study and unclear in five. Four of twenty one studies had high risk of contamination from the control group. Seven of twenty one studies did not adjust outcomes for confounding. Limited data available.</p>
<p>Santelli, J. S., Lindberg, L.</p>	<p>To explore the relative</p>	<p>Study uses data on 1991 to 2000</p>	<p>Primary analysis</p>	<p>Estimated the</p>	<p>Decreased adolescent</p>	<p>Study acknowledges</p>	<p>Self-reported was used,</p>

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<p>D., Finer, L. B., & Singh, S. (2007). Explaining recent declines in adolescent pregnancy in the United States: the contribution of abstinence and improved contraceptive use. <i>American journal of public health</i>, 97(1), 150–156. https://doi.org/10.2105/AJPH.2006.089169</p>	<p>contributions of declining sexual activity and improved contraceptive use to the recent decline in adolescent pregnancy rates in the U.S.</p>	<p>pregnancy and birth rates from the National Center for Health Statistics to compare measure of overall pregnancy risk with actual pregnancy rates</p>	<p>using secondary data (NSFG data from 1991 to 2001 on high school students)</p>	<p>percentages of female adolescents who were sexually active and measured specific contraceptive methods used by women during sexual intercourse. Each woman was assigned an individual contraceptive risk score based on the basis of the 2 most effective contraceptive methods she had used at her most recent sexual intercourse.</p>	<p>pregnancy rates were primarily attributable to improved contraceptive use. Vigorous promoting information on contraception, sexual behaviors, and relationships, as well as availability and accessibility of these services and supplies promote the value of responsible and protective behaviors.</p>	<p>differences due to race and age and its analysis included race/ethnicity-specific changes over time to calculate the mean and variance for the overall pregnancy risk index with an equation.</p>	<p>therefore there is a potential for over and under reporting. Adolescents may be more likely to underreport sexual activity or overreport contraceptive use. Sample sizes in the NSFG do not include enough of people of color, particularly black and hispanic subgroups. The study assumes that there are no changes in whether contraceptives were used correctly or incorrectly.</p>

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				They used this information to calculate the mean and variance of the contraceptive risk index.			
Oringanje, C., Meremikwu, M. M., Eko, H., Esu, E., Meremikwu, A., & Ehiri, J. E. (2016). Interventions for preventing unintended pregnancies among adolescents. <i>Cochrane Database of Systematic Reviews</i> , 2016(2). https://doi.org/10.1002/1465	To assess the primary prevention (school/community/home/clinic/family) preventions and their effects on unintended pregnancies among adolescents	52 RCTs that enrolled 105,368 adolescents.	Meta-analysis in which two authors independently assessed trial eligibility and risk of bias, and extracted data. Assessed quality of evidence using the GRADE approach.	Included both individual and RCTs (randomized controlled trials) evaluating any interventions aimed to increase knowledge relating to risk of unintended pregnancies, promote delay in initiation of sexual	Educational interventions were unlikely to significantly delay the initiation of sexual intercourse adolescents compared to controls. Educational interventions significantly increased reported condom use in adolescents compared	This is a recent study done in 2016. Participants were ethnically diverse. Relatively large sample size and statistical control for baseline differences.	Reliance on participants to report their behaviors accurately. Lack of biological outcomes, analysis neglects clustered randomisation and use of different statistical tests in reporting outcomes.

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1858.cd005215.pub3				intercourse, and encourage consistent use of birth control methods.	to controls who did not receive the intervention . For adolescents who received contraceptive-promoting interventions, there was little or no difference in risk of unintended first pregnancy compared to controls. A combination of educational and contraceptive-promoting interventions appears to reduce unintended pregnancy among adolescents.		

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					Evidence remains inconclusive about how each of these interventions offered alone can reduce the risk of unintended pregnancy in adolescents.		
Silva M. (2002). The effectiveness of school-based sex education programs in the promotion of abstinent behavior: a meta-analysis. <i>Health education research</i> , 17(4), 471–481. https://doi.org/	Synthesize the effects of controlled school-based sex education interventions on abstinent behavior, examine the variability in effects among studies, and explain the variability in effects between studies in terms of selected	12 research studies were utilized in the meta-analysis.	Meta-analyses that selected studies based on four criteria: interventions had to be geared to normal adolescent populations attending public or private schools in the U.S., experimental	Analyses of effect sizes were conducted utilizing the D-STAT software. Categorical and continuous univariate tests were run. Effect sizes were calculated from means and	No significant effect was associated with the type of intervention: whether the program was abstinence-oriented or comprehensive. Two moderators-parental participation and	This study only included published articles to avoid duplicates.	Primary research articles were not that common. Reduced number of studies met the criteria for inclusion.

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10.1093/her/17.4.471	moderator variables		or quasi-experimental in nature, recently published, and published in a peer-reviewed journal.	pooled standard deviations.	percentage of females-appeared to be significant in both the univariate tests and the multivariable model.		
Stanger-Hall, K. F., & Hall, D. W. (2011). Abstinence-only education and teen pregnancy rates: why we need comprehensive sex education in the U.S. <i>PloS one</i> , 6(10), e24658. https://doi.org/10.1371/journal.pone.0024658	To determine whether there is a significant correlation between level of prescribed abstinence education and teen pregnancy and birth rates across states.	Data was obtained from the Education Commission of the States. 30 of 38 state provisions had sex education laws.	Multivariate analysis and correlation (secondary study) based on data from the Education of Commission of the States in 2007. Used non-parametric correlations to assess relationships.	Categorized data on abstinence education into four levels (from most emphasis on abstinence: no provision, abstinence covered, abstinence promoted, abstinence stressed).	National data show that the incidence of teenage pregnancies and birth are positively correlated with the degree of abstinence education across states. States that had comprehensive sex and/or HIV education	Included factors such as socioeconomic status, ethnic composition, Medicaid, waivers, and educational attainment.	Richer states had a higher proportion of white teens, which meant that people of color were not examined as thoroughly in those states.

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					<p>and covered abstinence with contraception and condom use had the lowest teen pregnancy rates. Higher teen birth rates in poorer states were correlated with a higher degree of religiosity.</p>		

