EDUCATING WOMEN OF CHILDBEARING AGE ON PRE-CONCEPTUAL COUNSELING: REDUCING UNINTENDED PREGNANCY

by

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Kristin Olson, titled Educating Women of Childbearing Age on Pre-Conceptual Counseling Reducing Unintended Pregnancy and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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ABSTRACT

Purpose

The purpose of this project is to educate women of childbearing age on appropriate pre-conception counseling content to incorporate into their family planning. This is necessary due to the many health disparities preventing equal resources and accessibility for women of childbearing age.

Background

The rates of unintended pregnancy are continually unstable across the nation, therefore, emphasizing need for pre-conception counseling in healthcare for women of childbearing age is essential to prepare them for a healthy, intended pregnancy. While this is typically managed by an obstetrics provider, it is also a responsibility of primary care providers as this is a health promotion intervention.

Methods

Recruitment was done via social media for women of childbearing age. They completed a 10-question pre-survey to assess baseline knowledge, watched a concise audiovisual presentation regarding pre-conception counseling content, and completed a 10-question post-survey to assess their learning and if the information presented will affect their reproductive family planning.

Results

There were 25 participants (n=25), all of whom gave consent through the disclosure form provided within Qualtrics. The pre-test had a mean score of 71.2%, while the post-test had a mean score of 98.8%, showing significant improvement in participants’ learning with the
education provided, with a 100% “strongly agree” answer provided on the Likert-scale question assessing willingness to use this information in their own family planning.

**Conclusions**

While this project was conducted with a small sample size, the significant increase in understanding of pre-conception counseling in this project could be used for further research with other populations and settings.
INTRODUCTION

Background Knowledge

With approximately 45% of pregnancies being unintended currently, the need for pre-conception counseling is more critical than ever before (Finer, Lindberg, & Desai, 2018). The Centers for Disease Control and Prevention (CDC) considers this a vital issue as unintended pregnancies led to poorer birth outcomes and lead to $21 billion in medical costs in 2010 (CDC, 2018). An important factor related to the rate of unintended pregnancy in the United States (US) is that women of childbearing age are not being questioned regarding contraceptive intent when visiting their primary care provider, due to primary care providers feeling uncomfortable with educating on obstetrical-related care (Farahi & Zolotor, 2013). With chronic conditions being more prevalent than ever before, the need for pre-conception education regarding complications of pregnancy due to diabetes, hypertension, and other forms of chronic disease could improve pregnancy outcomes dramatically if women of childbearing age intend to get pregnant (Farahi & Zolotor, 2013). Pre-conception counseling consists of family planning, establishing goals to obtain a healthy body weight, updating immunizations, and reviewing medications that may be harmful to a potential pregnancy (Farahi & Zolotor, 2013). It also includes assessment of environmental exposures, social history (i.e., alcohol, tobacco, & recreational drug use) as well as screening for psychiatric illness and domestic violence.

Various pre-conception counseling interventions have been tested in the primary care setting to determine their effects on pregnancy, including implementation of a family planning specialized program for women of childbearing age to attend when visiting their primary care provider (Hussein, Kai, & Qureshi, 2016). There was a review of eight studies, with four
conducting multifactorial interventions, while the other four studies implemented single factor educational interventions, such as folic acid requirements to prevent neural tube defects (Hussein et al., 2016). The review found that whether the education was focused on a single issue, or was multifactorial in nature, women who became pregnant were highly compliant with their plans of care and made appropriate health-related decisions to protect the well-being of themselves and their baby (Hussein et al., 2016). Another potential intervention that has been tested is in women of childbearing age already diagnosed with type 1 diabetes (T1DM); this was a specialized pre-conception education program to explore the changes that occur in managing diabetes once a pregnancy occurs (Fischl et al., 2010). Compared to the costs of hundreds of thousands of dollars per patient for medical interventions in diabetes, the cost of implementing this educational program to improve overall health status in pregnancy was significantly less and women were confident in managing their diabetes during pregnancy (Fischl et al., 2010).

The issue of pre-conception counseling is becoming widely known among health care providers, specifically those in the primary care setting (Farahi & Zolotor, 2013). The Centers for Disease Control and Prevention (CDC) have developed a framework of guidelines to follow not only in counseling patients who wish to receive contraceptives but have now also developed guidelines for all pertinent issues to address in pre-conception counseling (Farahi & Zolotor, 2013). These include assessment of environmental exposures (both at home and in the workplace), genetic history, current medication lists, screening for sexually transmitted diseases, screening for psychiatric illness, and screening for domestic violence (Farahi & Zolotor, 2013).
Local Problem

The statistics regarding levels of unintended pregnancy here in Arizona are even higher than the national average (Guttmacher Institute, 2016). In 2010, 51% of pregnancies were unintended in Arizona, with a rate of 49 per 1,000 women having an unintended pregnancy (Guttmacher Institute, 2016). In 2010 alone, federal and state governments spent $671 million on unintended pregnancies within the state of Arizona (Guttmacher Institute, 2016). With both Medicaid and the Title X national family planning program being available, there needs to be an assessment of accessibility and resources to these programs for women of childbearing age within Arizona (Guttmacher Institute, 2016). Stakeholders, including physicians, nurse practitioners, and other providers, as well as insurance companies and operators of publicly funded family planning programs can all aid in developing a framework to identify barriers to pre-conception counseling in order to increase accessibility (Guttmacher Institute, 2016).

When publicly funded family planning services are provided and utilized, it saves taxpayers on average $13 billion per year (Guttmacher Institute, 2016). The severity of the problem of unintended pregnancy has been extensively reviewed through the use of government-reported statistics (Guttmacher Institute, 2016).

To review statistics specific to Pima county where the project will be conducted, the percentage of women who received early prenatal care was significantly less than the average for Arizona (73.8% in Pima county compared to 81.3% in Arizona) (Pima County Health Department [PCHD], 2014). Furthermore, mothers in the Ajo, south Tucson, and Flowing Wells areas had rates of 130.4, 110.9, and 122.2 per 1,000 births with late or no prenatal care (PCHD, 2014).
Intended Improvement

Project Question

This project seeks to answer the following question: Will educating women of childbearing age on the importance of integrating pre-conception counseling and associated tools into their reproductive family planning be effective in improving their knowledge?

Project Purpose and Specific Objectives

The purpose of this project is to educate women of childbearing age on the need to incorporate pre-conception counseling as part of their reproductive family planning and learn appropriate questions to ask their healthcare provider, to increase their chances of a successful, intended pregnancy. The more specialized aims of the project include the following: 1) Educating women of childbearing age on what pre-conception counseling should entail and appropriate interventions based on their medical histories and 2) Using the data gained from the project to create the foundation of establishing a potentially universal pre-conception assessment screening tool to integrate in the primary care setting which is beyond the scope of the immediate project.

Literature Synthesis

In order to successfully implement a project regarding this topic, a literature search was conducted through several electronic databases, including CINAHL, PubMed, EMBASE, and Google Scholar. The search was conducted for original research articles that studied integration of pre-conception counseling into the primary care setting using keywords of “pre-conception counseling,” “primary care setting,” “educating primary care providers,” and “assessment of contraceptive intent” all with the term pre-conception included in the search. Dates were
specified to include 1990 until now as some original articles of when pre-conception counseling first emerged were desired to identify different perspectives from that point in time until the present. The search yielded 47 results and after applying inclusion criteria that will be discussed in the following section, 14 articles remained that were most pertinent to the project topic.

Inclusion criteria were original research studies and educational recommendations based on those studies, focusing specifically on studies that were conducted within the U.S. The article foci needed to include women of childbearing age (18-44 years of age for purposes of this project). Exclusion criteria were studies that focused on pre-conception adjustments for women of childbearing age who were dealing with acute medical issues (i.e., deep vein thrombosis, influenza). Furthermore, exclusion included studies that focused on specific religious or ethnic groups that could not be generalized to women of childbearing age in a broader sense.

**Appraisal of Evidence**

**Influences on Successful Implementation**

Research has identified several barriers to and facilitators of successful implementation of pre-conception counseling within the primary care setting. Examples of barriers include provider reluctance to screen and discuss family planning with their female patients of childbearing age, inadequate funding for program implementation, the need to address health disparities, and time constraints within the primary care visit (Coffey & Shorten, 2014; Sackey & Blazey-Martin, 2019). However, one facilitator for pre-conception counseling has also been identified: the effectiveness of informational posters and brochures in waiting areas to emphasize the benefits of this form of counseling (Sackey & Blazey-Martin, 2019).
Self-Care Compliance and Neonatal Outcomes

Patient compliance to self-care varied depending on exposure to pre-conception counseling programs. Hussein et al. (2016) conducted a systematic review of eight studies to identify the effects of intervention and compliance on neonatal outcomes. Four of the eight studies included a multifactorial risk assessment of the patients of childbearing age, while four implemented folic acid supplementation. Compliance with care plans and medical interventions was just shy of 100% in all of the studies, leading to healthy pregnancies (Hussein et al., 2016). Moos et al. (1996) selected 456 out of 1378 women receiving prenatal care in the primary care setting for a specialized pre-conception counseling program and of those exposed to the program, there was a 51.8% greater likelihood of intended pregnancy and compliance with conceptual care plans. Women with diabetes were shown to have higher self-care compliance and healthier pregnancies after participation in pre-conception counseling programs specializing in chronic disease management (Fischl et al. 2010; Wilhoite et al. 1993). Fischl et al. (2010) introduced 43 out of 88 teenagers with T1DM to this kind of specialized family planning program and there was statistical significance (p < .001) that those exposed to the program could better manage their diabetes throughout their pregnancy, subsequently producing better pregnancy outcomes. Wilhoite et al. (1993) monitored 185 pregnancies where the mothers were diagnosed with gestational diabetes. Sixty-two of the 185 mothers participated in a pre-conception counseling program (Wilhoite et al., 1993). For those who underwent the pre-conception counseling program, one newborn had a congenital heart defect and there were four neonatal deaths (Wilhoite et al., 1993). In contrast, those who were not exposed to the pre-conception program
had eight infants with congenital anomalies and 26 neonatal deaths, further emphasizing the importance of pre-conception counseling (Wilhoite et al., 1993).

**Surveys to Assess Baseline Knowledge**

From another research standpoint, surveys have been conducted on both primary care providers and female patients of childbearing age to assess baseline knowledge of pre-conception counseling. Kitamura, Fetters, and Ban (2005) conducted a survey to assess knowledge of pre-conception counseling in primary care providers and willingness to integrate it into their practice. Only 4% of providers reported incorporating pre-conception counseling in their practice, with seventy percent being willing to integrate it as long as proper education was provided to them, further emphasizing the importance of this project (Kitamura et al., 2005). Furthermore, a survey was conducted on 200 women to assess their contraceptive intent, as well as baseline knowledge of pre-conception counseling (Raine-Bennett & Roca, 2015). Some 73% of the survey participants were wanting to conceive within a year but did not ever receive contraceptive assessment in the primary care setting and had never been counseled on family planning (Raine-Bennett & Roca, 2015).

As a result of the various perspectives of the research that has been done regarding this topic, several professional organizations have developed guidelines for medical recommendations for pre-conception counseling sessions (Fowler, Mahdy, & Jack, 2019). The guidelines for education are based on individualized characteristics of each woman of childbearing age (Fowler et al., 2019). These include chronic disease management, toxin exposure, smoking cessation, alcohol and substance abuse, and infectious disease management (HIV, Hepatitis B, etc.) (Fowler et al., 2019).
**Strengths of the Evidence**

There are a variety of strengths throughout the research articles retained for purposes of this project. Statistics have shown that exposure to a pre-conception counseling program drastically reduced the number of infant deaths and congenital anomalies within the Maine Diabetes in Pregnancy Program (Wilhoite et al., 1993). The Maine Diabetes in Pregnancy program supports this project by showcasing how pre-conception counseling can drastically reduce adverse effects in pregnancy, as well as significantly improve health of the newborn after delivery (Wilhoite et al., 1993). A systematic review by Hussein et al. (2016) extensively discussed how exposure to both multifactorial and single issue-focused pre-conception counseling programs significantly increased compliance with care and the participants of those programs made healthy choices for their pregnancies (Hussein et al., 2016). This systematic review supports this doctoral project by reiterating that pre-conception counseling increases self-efficacy and health management of this patient population in both high- and low-risk pregnancies (Hussein et al., 2016).

Surveying primary care providers showcased their willingness to implement pre-conception counseling into their practice setting as long as they underwent proper education (Kitamura et al., 2005). Not only does this emphasize the importance of this project and the need for educating providers on pre-conception counseling, but it should encourage health educators to develop specialized training programs for providers willing to learn pre-conception content to reduce pregnancy complications (Kitamura et al., 2005). Fischl et al. (2010) also showed if a pre-conception counseling program is developed appropriately, the costs of developing the program are significantly less than the medical costs of a high-risk pregnancy and delivery. Development
of a pre-conception screening tool is a low-cost effective way of guiding providers to establish a focused, individualized plan that would promote a healthy pregnancy for their patients desiring to conceive (Raine-Bennett & Roca, 2015). Lastly, clinical guidelines for pre-conception counseling established as a result of the studies done can simplify the process of educating providers by emphasizing the need for development of an individualized contraceptive plan based on health histories and disease management (Fowler et al., 2019).

**Weaknesses of the Evidence**

While there are many strengths of the evidence that support the need for this project, there are weaknesses present as well. The systematic review identified increased compliance with care and chronic disease management, but the researchers did not follow up to determine the actual effects on pregnancy outcomes or if it created a reduction in adverse effects of the pregnancy (Hussein et al., 2016). Many realistic barriers were identified and included uncertainty in obtaining adequate funding needed to fully implement pre-conception counseling (Coffey & Shorten, 2014). Time constraints presented as a barrier in primary care is an essential problem as providers are often fully booked and have extensive and complex patient loads (Sackey & Blazey-Martin, 2019). Rural primary care providers are often responsible for pre-conception counseling as specialists are not typically available in these areas and adequate funding in the rural practice setting can be difficult to establish and maintain (Coffey & Shorten, 2014).

**Gaps and Limitations of the Evidence**

A major gap in the research is a more in-depth look at actual funding estimates of implementing a pre-conception counseling program and comparing it to the costs of adverse effects at a delivery or the medical costs of a high-risk pregnancy. Of the providers surveyed who
actually utilize pre-conception counseling in their everyday practice, a more in-depth assessment of how they learned pre-conception counseling and the level of which they are appropriately educating their patients would help guide future providers on implementation of this concept into their own practices (Kitamura et al., 2005). Pilot studies incorporating the contraceptive assessment screening tool into primary care practices could further verify its validity and reliability for future use on a more global scale (Raine-Bennett & Roca, 2015). Further long-term studies to assess potential relationships between comprehensive pre-conception counseling and reduction of adverse effects in pregnancy and for birth outcomes could better emphasize the importance of the issue as a whole.

**Theoretical Framework**

**Pender’s Health Promotion Model**

The health promotion model (HPM) was developed by Nola Pender and first appeared in literature in 1982 with many revisions over time (Pender, 2011). The goal of this model was to help healthcare providers link social determinants of health and their effects on health behaviors (Pender, 2011). This was then utilized as fundamentals of educational sessions with patients to promote various healthy lifestyles depending on their health history (Pender, 2011). It is based in philosophy on the reciprocal interaction world view, where humans are studied segmentally in many contexts, but in the big picture are viewed holistically (Pender, 2011). This philosophical belief also encompasses that direct human interaction with its environment shapes the plan by which humans meet their goals (Pender, 2011).

The model is based on two theories: expectancy value theory and social cognitive theory (Pender, 2011). The expectancy value theory is the concept that individuals complete tasks to
accomplish goals that will be of significant importance to them; the social cognitive theory is based on the interdependent relationship of thoughts, behavior, and environment (Pender, 2011). The model itself is focused on eight concepts that include person, environment, nursing, health, illnesses, individual characteristics, behavior-specific cognitions, and behavioral outcomes (Pender, 2011). This model emphasizes the importance of educating patients appropriately to increase their self-efficacy, creating alterations in their behavior by changing their approach to any given health situation (Galloway, 2003).

**Linking the Project and the Health Promotion Model**

The fundamentals of the HPM directly link to the idea of pre-conception counseling and have been studied within this setting, incorporating counseling throughout the pregnancy as well (Beldon & Crozier, 2005). Nurse midwives and nurse practitioners (NPs) are often responsible for the educational aspects of patient care, including pre-conception counseling (Beldon & Crozier, 2005). As these providers are typically nurses first, they are able to understand the holistic picture of the patient and are able to identify barriers that may prevent them from compliance with pre-conception and pregnancy care (Beldon & Crozier, 2005). In identification of mutual goals between the provider and the patient, the patients’ goals are more likely to be met if barriers are addressed affecting their health behaviors and accessibility to adequate pre-conception care (Beldon & Crozier, 2005). Midwives and advanced practice providers are responsible for learning the patients’ demographics, and lifestyle characteristics, and integrating those characteristics to make their pre-conception plan of care individualized to promote the best health outcomes (Beldon & Crozier, 2005). Through the use of the HPM, pre-conception
counseling is being utilized to address lifestyle behaviors and modify them as necessary for
improvement in health status (Beldon & Crozier, 2005).

**Figure 1**

*Diagram of the Health Promotion Model Being Utilized to Implement this Pre-conception Counseling Project*


**Illustration of this Project Implemented with the Health Promotion Model**

**Concepts of the health promotion model.** As stated previously, there are eight concepts
utilized in this model (Pender, 2011). A person is defined as an organism to create a co-
dependent relationship with the environment, where life experiences alter health decisions
(Pender, 2011). The environment includes all physical, social, and cultural aspects of life
Nursing is defined as collaborative care with patients and their families to promote health and well-being (Pender, 2011). Health is defined as the greatest human potential that is met by way of meeting goals, self-efficacy, and the strength of relationships with others (Pender, 2011). Illness is any acute or chronic condition that creates a barrier for the goal of health (Pender, 2011). Individual characteristics include past chosen behaviors in combination with demographics and current lifestyle characteristics (i.e., food choices) (Pender, 2011). Behavior-specific cognitions include perceived barriers, benefits, and self-efficacy of an action (Pender, 2011). Behavioral outcomes are the termination point in the model and are the health decisions made based on completed educational sessions and behavioral modification as necessary (Pender, 2011).

**METHODOLOGY**

**Project Design**

This was a quality improvement (QI) project based on educating women of childbearing age to incorporate pre-conception interventions into their reproductive family planning to increase their chances of timed pregnancies with healthy outcomes (Agency for Healthcare Research and Quality [AHRQ]), (AHRQ, 2019). It included pre- and post-surveys based on an educational session given to participants regarding the characteristics and benefits of pre-conception counseling.

**Model for Improvement to Implement the Project**

The model for improvement incorporates a plan-do-study-act (PDSA) cycle as a process for QI within a pre-existing healthcare system (Institute for Healthcare Improvement [IHI]) (IHI, 2020). The PDSA cycle incorporates a pilot study to initiate an intervention into a small setting.
initially and if it is successful, the same intervention and process can then be implemented into a larger setting (IHI, 2020). It also incorporates three questions that create the foundation for the model which are the need to know what is being accomplished, assessment of change to know there is an actual improvement, and the changes that are possible to create an improvement (IHI, 2020). For purposes of this project, a PDSA will be implemented within a small facility (IHI, 2020).

The model for improvement is utilized based on its fundamental steps: forming a team, establishing aims, and making changes to reproductive planning as needed, as well as education in the primary care setting (IHI, 2020). Setting aims included completing the educational session for participants and assessment of willingness to incorporate pre-conception counseling into their family planning by the end of this year after the project (IHI, 2020). Changes will include educating women of childbearing age on pre-conception interventions to promote timed pregnancies with healthy outcomes (IHI, 2020). If this education creates successful outcomes, the participants will have timed pregnancies with healthy outcomes, which is beyond the scope of this project (IHI, 2020).
Project Setting Including Stakeholders

The setting for this project was over virtual direct communication with women of childbearing age wanting to conceive. The patient demographic was women of childbearing age,
via a Facebook community group where discussion of wanting to conceive is occurring and with permission of group leaders. With the focus being on women of childbearing age, this was an appropriate setting as there are several established potential participants within the desired age group. Potential future stakeholders include the patients and many healthcare professionals who each play a different role in pre-conception counseling (St. Joseph’s University, 2011). This includes primary care providers as they will be conducting the pre-conception counseling, medical assistants as they complete initial screening and paperwork with patients, and potentially pharmacists who will be dispensing medications as a result of pre-conception counseling specialized interventions, such as folic acid supplementation (St. Joseph’s University, 2011). Lastly, the participants (patients in the office setting) themselves are primary stakeholders as their health status is directly affected by being recipients of the specialized counseling program (St. Joseph’s University, 2011).

Planning the Intervention

Initially, a preliminary survey was created to assess participants’ baseline knowledge of pre-conception counseling and its benefits. A PowerPoint presentation was designed that lasted approximately 15 minutes in length and included data regarding the rates of unintended pregnancy specific to Arizona, statistical evidence that showcases the direct effects of pre-conception counseling and a reduction in rates of unintended pregnancy, as well as pre-conception content that leads to improved pregnancy outcomes. In addition, the presentation included a brief introduction on appropriate questions to ask their healthcare provider. A post-survey was developed to assess both participants’ gained knowledge from the presentation and their willingness to apply this knowledge into their individualized family planning plan.
Participants and Inclusion/Exclusion Criteria

The sample size for the portion of this project on educating women of childbearing age was 25 participants. They were recruited through direct virtual contact within a Facebook group. Participants were women of childbearing age within common Facebook groups to discuss their reproductive family planning concerns. Inclusion criteria include women of childbearing age, ages 18-44, of any ethnicity wanting to conceive within the next year. Their primary language was English. Exclusion criteria included women of childbearing age who are not within the ages of 18-44 and who have a specific chronic condition preventing them from becoming pregnant or those who are not English speaking.

Consent and Ethical Considerations

Participants were given a disclosure form (Appendix A) and consent is implied if they proceed with participation in the study. This was discussed within the disclosure form. Ethical considerations included respect for persons, which started with the disclosure process and the participants giving their consent based on the disclosure form (Committee on Federal Research Regulations and Reporting Requirements [CFRRRR], 2016). This incorporated the ethical principle that individuals should be treated autonomously, giving them voluntary consent or refusal for research studies such as this project (CFRRRR, 2016). By nature of the project, vulnerable populations who would be entitled to additional protection—elderly, children, or disabled persons—were not involved (CFRRRR, 2016). This project also incorporated the ethical principle of beneficence, which maximizes benefits and reduces harm to participants of the study (CFRRRR, 2016). This was done using statistical evidence within the educational session for participants about the benefits of integrating pre-conception counseling into their
individualized reproductive family planning to increase their chances of becoming pregnant (CFRRRR, 2016).

The ethical principle of justice was utilized within this project, which includes fairness in selection of participants (CFRRRR, 2016). All eligible women of childbearing age based on inclusion criteria were considered for the project equally, as well as any additional women of childbearing age who inquired about participation in the study. Recruitment ceased once the desired number of participants was achieved.

**Development of Tool for Data Collection**

Data collection was conducted for this project based on an anonymous pre- and post-test after an educational session for participants regarding incorporation of pre-conception counseling into their individualized family planning. The surveys were administered through Qualtrics software. Questionnaires were developed based on fundamental characteristics including design methodology, determining feasibility, development of instruments, selecting the sample, conducting a pilot test using the tests, and revising the instruments as needed prior to using them in this quality improvement project on a broader scale (Walonick, 2010). Good quality questions were developed based on the necessary components including evoking the truth, incorporating one-dimensional answer choices, accommodating all appropriate possible answers, providing mutually exclusive options, and allowing for variability in answers (Walonick, 2010). The survey was 10 questions in total, 9 of which were multiple choice, based on statistics provided in the educational session with four answer choices for each question. The last question was a Likert-scale question on a 10-point scale, assessing willingness of participants to integrate this
pre-conception counseling session into their family planning (Appendix B) (Dell-Kuster et al., 2014).

**Data Analysis**

Due to the small sample size of this study, descriptive statistics were utilized and determined to be most appropriate for the statistical analysis portion (Nayak & Hazra, 2011). Descriptive statistics include measures of central tendency, such as the mean, median, and mode (Nayak & Hazra, 2011). To calculate these values after the study was completed, the descriptive statistics tool in Excel was utilized. Since the participants in this study were paired based on pre- and post-test measurements, descriptive statistics were the best choice for this study because it is appropriate for comparative studies with a small sample size (Nayak & Hazra, 2011). When using descriptive statistics, the greater the sample size, the more reliable it is considered and the greater it will represent a larger population of women with similar characteristics (Nayak & Hazra, 2011). As the sample size increases when using descriptive statistics, the confidence level increases and margin of error decreases, giving this type of analysis the ability to increase rigor, needed to produce reliable results (Nayak & Hazra, 2011). Rigor is needed to make valid conclusions from the data, to promote whether pre-conception counseling is effective in this setting (Nayak & Hazra, 2011). Bias was ultimately reduced by confirming with each participant that the pre-survey had been completed prior to viewing the presentation and the post-survey had been completed after viewing the presentation, reducing the likelihood of submitting the same answers twice (Nayak & Hazra, 2011). Data will be protected as only those who are participating had access to the surveys and did use a confidential and personal password when submitting the surveys, maintaining anonymity. This project coordinator was the only person who had access to
the data through the use of an Excel spreadsheet. Data will be stored long-term in the Qualtrics platform as this is a secure database.

RESULTS

Outcomes

The consents from participants were given from August 8th, 2020 until August 14th, 2020 and the project was implemented from August 15th, 2020 until September 1st, 2020 (Appendix C). There were 25 participants in total, all of whom gave consent through a consent form provided electronically on Qualtrics and completed all phases of the project. The demographics of the participants were the following: 100% of the participants were in the desired age group of 18-44 years age of age as this is the standard categorization for women of childbearing age for this project. In terms of ethnic background, 88% of participants were Caucasian and 12% of participants were Hispanic. All of the participants wanted to conceive within the next year, reside in southern Arizona, and had a primary language of English. One hundred percent of the participants graduated from high school and 80% of the participants had at least an associate degree from the college level.

The pre-test prior to viewing the presentation had a mean score of 71.2% (Figure 3) and all (100%; N=25) participants answered “strongly agree” on the Likert scale question asking participants if they would use this information in their own family planning. The median score was 70% on the pre-test and the mode on the pre-test was also 70%. The post-test after viewing the presentation had a mean score of 98.8% (Figure 4) and all (100%; N=25) participants answered “strongly agree” on the Likert scale question asking participants if they would use this information in their own family planning. The median score on the post-test was 100% and the
mode score on the post-test was also 100%. This showed a significant increase in understanding of the information presented and showed the participants’ engagement in learning the content, as well as its applicability to their real-life desire to have children. The most frequently missed questions were the question regarding how many unintended pregnancies there are per year and the recommendations for exercise to increase chances of conception. These questions were answered correctly on all of the post-tests (Table 1).

Figure 3

*Graph of Pre-test Results for Project*
**Figure 4**

*Graph of Post-test Results for Project*

![Graph of Post-test Results](image)

**Table 1**

*Comparison of Pre-survey Result Answers and Post-survey Result Answers*

<table>
<thead>
<tr>
<th>Question</th>
<th>Correct on Pre-test</th>
<th>Correct on Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is pre-conception healthcare?</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>What is the rate of unplanned pregnancy in the U.S. right now?</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>During pre-conception care, which of the following chronic health problems and/or birth defects would we discuss?</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Which of the following is a pre-conception intervention used around the world to prevent neural tube defects?</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>How long do you think you should prepare for a healthy pregnancy before trying to become pregnant?</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Which of the following you can do to prepare for a healthy conception and pregnancy?</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>What intervention is part of planning for conception?</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>How much exercise should you get per week?</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>Would you be willing to incorporate this information into your reproductive family planning?</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>
The results of this project have a significant link to the project question, purpose, and objectives. The project question was directly answered in the implementation phase by the pre- and post-test survey model because the post-test showed a significant increase in the participants’ knowledge regarding the content of pre-conception counseling and the most important concepts for them to know in their family planning. The latter portion of the project question regarding increasing their compliance with their healthcare is beyond the scope of this project and would require long-term follow-up with these participants to see if they use the content of this project in their family planning and successfully conceive. The first objective of this project was successfully completed by providing the 25 participants fundamental concepts of increasing their chances of conception, as well as preventing high-risk complications based on their individualized medical histories. The second objective of this project would need to be completed in future research because it would require utilizing the results of this project to develop a pre-conception screening tool to integrate in the primary care setting to implement better quality education sessions for patients wanting to conceive.

During the time of implementation, there were no unexpected problems with the technical aspects and all participants who gave consent completed all phases of the project. There were no modifications made to the content of the intervention once implementation was in place. Prior to applying to the Institutional Review Board (IRB) for implementation, the pandemic came into effect and caused major alterations to the project. This project was initially designed for primary care providers with education to feel more comfortable educating their female patients on pre-conception planning as this is typically deferred to obstetrical providers. With restrictions in place from the pandemic, presenting at an in-person site was not allowed and
the target of the project changed to the potential patients themselves as a virtual presentation became necessary.

**DISCUSSION**

**Summary**

Based on the high rates of unintended pregnancy, which is 45% for the U.S. as a whole, a project was needed to educate women of childbearing age on proper family planning to promote healthy pregnancies if they were to conceive (Guttmacher Institute, 2016). Both single factorial (i.e., folic acid supplementation) and multi-factorial (i.e., managing diabetes in the pre-conception period) pre-conception interventions have increased compliance and rates of intended, healthy pregnancies (Hussein et al., 2016). This project was an expansion of pre-existing research into providing a brief overview of pre-conception education and what this content would look like when presented by their primary care provider. Creating an education module for primary care providers to use in educating their patients on pre-conception interventions could be used beyond the scope of this project.

**Key Findings**

The strengths of this project were that the presentation was developed to be understood by the general population in hopes of promoting healthy family planning and successful conception. The content was developed in a way that was understood by participants because the post-survey average scores were 27.6% greater than those on the pre-survey, concluding that the education was effective in increasing the participants’ pre-conception knowledge base. It was also a strength that 100% of participants reported that they would utilize this information when planning for pregnancy. This contributes to successful achievement of the project purpose which
is to increase knowledge for women of childbearing age on pre-conception lifestyle changes to increase chances of conception.

**Interpretation**

Based on the findings of the project with the post-survey average score being near 100%, the education provided as the intervention for participants was effective in increasing their pre-conception knowledge base. Referring back to the project question “Will educating women of childbearing age on the importance of integrating pre-conception counseling and associated tools into their reproductive family planning be effective in improving their knowledge and compliance with their healthcare?,” this project answers the initial portion of the question that a pre-conception education intervention would improve their knowledge. Addressing their compliance with their health care would require long-term close follow-up with participants to see if they have utilized this information in their family planning and been successful in conceiving.

Several research studies have been conducted on single factor interventions that were incorporated into this project as a whole (i.e., folic acid supplementation, controlling diabetes in pregnancy, exercise regimens to increase fertility) and this pre-existing research has helped to develop evidence-based guidelines for providers to educate their patients in this area (Farahi & Zolotor, 2013). Advising women of childbearing age to take at least 400 mcg of folic acid supplementation a day when planning to conceive has an evidence grade of “A,” which shows the research has proven there is significant evidence that this intervention is effective in reducing neural tube defects in newborns (Farahi & Zolotor, 2013). In addition, educating women who
wish to conceive who have diabetes must achieve the goal A1C of less than 7% to increase
chance of conception also has an evidence grade of “A” (Farahi & Zolotor, 2013).

The project as a whole went as expected. The plan was for the education provided as an intervention to provide insight to participants about how significant their planning needs to be when trying to conceive. It was surprising that everyone who gave consent completed all portions of the project, but this is an important area of education that is often missed or skimmed over in a variety of clinical scenarios. In addition, the COVID-19 pandemic changed the target of the project from educating the providers to educating the targeted patient population, therefore, changing the level of content provided.

**Implications**

**Practice**

Educating women of childbearing age on each of these pre-conception interventions will likely increase their chance of conception and having a healthy pregnancy. This education can be provided not only by obstetrical providers, but also by primary care providers, or midwives, and can be addressed by specialists when medication or care plan adjustments need to be made to promote an intended and healthy pregnancy.

**Education**

Providing healthy-pregnancy resources and support to primary care providers will likely help them feel more comfortable educating their patients on healthy practices during pregnancy (Kitamura et al., 2005) Pregnancy-related patient education is an area that many primary care providers feel uncomfortable with, particularly because of believing they are underprepared to guide their patients in the area of pre-conception care. Educational interventions on conducting
long-term follow-up care might boost provider confidence and potentially increase the rates of successful pregnancies and births among their patients (Kitamura et al., 2005).

**Research**

Due to this being a small study with a small sample size, research can be further developed by creating and piloting an educational program for a population of rural residents to assess those with different demographics. Since rural residents tend to have fewer resources, enabling primary care providers to offer pre-conception education to their patients could increase the rates of healthy, intended pregnancies. Finally, because the demographics of this project were not diverse, future research providing education to women of underrepresented populations may show more generalizable results.

**Policy**

This project also has implications for future policy development in that evidence-based interventions such as folic acid supplementation can serve as a foundation for mandatory policies to guide providers at various health care facilities. These policies could emphasize the need for women of childbearing age to have pre-conception counseling, therefore potentially improving pregnancy and birth outcomes.

**Limitations**

This project did have limitations. The results are not necessarily generalizable due to the lack of diversity in demographics of the participants. With the country being extraordinarily diverse, recruitment was open for those who met the age and geographic criteria. Efforts were made to minimize limitations by making a general post on Facebook to recruit participants as there is diversity present on social media. Efforts were made to limit bias as participants who
consented to the project were asked to create a pin that would keep their information anonymous. Further research would need to be conducted implementing pre-conception education with an equally diverse group of participants in order to use statistical evidence that is more generalizable.

**DNP Essentials Addressed**

This project addresses many doctor of nursing practice (DNP) essentials through its entirety. It addresses *DNP Essential I: Scientific Underpinnings for Practice* through evaluation of its successful outcomes and creating a foundation for development of future pre-conception education programs. This project could be sustainable as with statistical significance of providing education with a small sample size, this could be tested with a larger sample size with samples from different geographic locations to further test its validity.

This project also addresses *DNP Essential IV: Using Technology to Transform Healthcare* as this educational session was provided electronically with easy accessibility for those to view from home. Further research in this subject with larger samples in a variety of locations could promote development of electronic documentation plans to include this in the patients’ care plans where it is applicable. Electronic pre-developed order sets with pre-conception interventions and educational recommendations could be useful within the electronic health record.

Lastly, this project addresses *DNP Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes* as pre-conception planning and interventions would require collaborative care between decision-making of the patient, the primary care provider, and adjustments from specialist providers based on the acuity of the
patient. Furthermore, healthcare staff who specialize in the pre-conception knowledge base could collaborate with providers who are not as comfortable and aid in managing care plans of those providers’ patients.

Conclusions

This project was developed by creating a pre- and post-survey with an audiovisual presentation in between to provide women of childbearing age with education regarding lifestyle changes and interventions to plan and maintain a healthy pregnancy. The main findings of the project were that the education provided was useful and raised the survey scores 27.6% on average from the baseline pre-survey scores once participants viewed the educational presentation. This emphasizes the need for properly educating women of childbearing age on the appropriate steps to take to properly plan and maintain a healthy pregnancy. Despite the small sample size of the project, the significance of improvement in the knowledge base of these participants leaves space for development of similar future projects targeting other populations and sample sizes to assess effectiveness of the same education.

Plan for Sustainability

This project could be easily sustained through the virtual setting similar to what this project was conducted through or for future use in an in-person clinical setting for a quick educational session for women of childbearing age who would like to conceive. For future virtual use, this project could be used by others with the same recruitment and consent process. This could be used within specialized Facebook groups for infertility, those wanting to conceive, or groups for those in early pregnancy who may develop healthier outcomes by following this
education. The education provided in the virtual presentation could be transferred to a pamphlet or brochure for in-person clinic use if a patient presents for pre-conception counseling.

**Plan for Dissemination**

This project was developed for the purpose of local publication. This was due to the decision to focus on a sample who lives within the local region of the University of Arizona. This project could be replicated in other geographical locations in future use, but the specific purpose of this project was to provide local healthcare professionals and residents with the information to show the impact of the education provided within the local region.
APPENDIX A:

THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD DETERMINATION LETTER
Date: July 22, 2020
Principal Investigator: Kristin Olson
Protocol Number: 2007860360
Protocol Title: Educating women of childbearing age on pre-conceptual counseling: Reducing unintended pregnancy

Determination: Approved
Expiration Date: July 21, 2025

Documents Reviewed Concurrently:

- Data Collection Tools: DNPPProjectSurvey.docx
- HSPP Forms/Correspondence: KristinIRB.pdf
- HSPP Forms/Correspondence: list_of_research_personnel_04-2020 (I)(I)Kristin Olson (I) ADMIN.pdf
- HSPP Forms/Correspondence: Olson-application-waiver_2019-08 ADMIN.pdf

Informed Consent/PHI Forms:
- DNPPprojectdisclosureformupdated.docx
- DNPPprojectdisclosureformupdated.pdf

Participant Material:
- approachproject.pptx

Recruitment Material:
- DNPPprojectrecruitmentemail.docx

Regulatory Determinations/Comments:
- The project is not federally funded or supported and has been deemed to be no more than minimal risk.
- The project listed is required to update the HSPP on the status of the research in 5 years. A reminder notice will be sent 60 days prior to the expiration noted to submit a 'Project Update' form.

This project has been reviewed and approved by an IRB Chair or designee.
- The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218)
- All research procedures should be conducted according to the approved protocol and the policies and guidance of the IRB
- The Principal Investigator should notify the IRB immediately of any proposed changes that affect the protocol and report any unanticipated problems involving risks to participants or others. Please refer to Guidance Investigators Responsibility after IRB Approval, Reporting Local Information and Minimal Risk or Exempt Research.
- All documents referenced in this submission have been reviewed and approved. Documents are filed with the HSPP Office.
APPENDIX B:

CONSENT DOCUMENT (DISCLOSURE AND CONSENT FORM)
**Project Title:** Educating women of childbearing age on pre-conception counseling

**Principal Investigator Name:** Kristin Olson

The purpose of this project is to educate participants who are women of childbearing age on the benefits of pre-conception education into their family planning to promote healthy, planned pregnancies.

If you choose to take part in this project, you will be asked to complete a pre-test prior to a 15-minute presentation regarding the benefits and statistics of integrating pre-conception counseling into your reproductive family plans. It will take approximately 5 minutes to complete this survey and there will be a 5-minute post-survey after the presentation. There are no foreseeable risks associated with participating in this project and you will receive no immediate benefit from your participation. Survey responses are anonymous.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call Kristin Olson, RN, BSN, DNP-FNP student at (702) 682-3593 or email at kristinolson@email.arizona.edu
APPENDIX C:
EVALUATION INSTRUMENTS (PRE-SURVEY TO ASSESS BASELINE KNOWLEDGE OF PARTICIPANTS)
PRE-SURVEY TO ASSESS BASELINE KNOWLEDGE OF PARTICIPANTS

1) What is pre-conception healthcare?
   A. Healthcare for women of childbearing age (18-44)
   B. Specialized healthcare for women of childbearing age wanting to become pregnant
   C. Specialized healthcare during pregnancy
   D. A one-time visit to a health care provider for women of childbearing age to ask questions about becoming pregnant

2) What is the rate of unplanned pregnancy in the U.S. right now? (It’s okay to guess if you don’t know this).
   A. 25%
   B. 68%
   C. 51%
   D. 46%

3) During pre-conception care, which of the following chronic health problems and/or birth defects would we discuss? (Choose all that apply)
   A. Neural tube defects (affects the baby’s spine or brain)
   B. Diabetes in pregnancy
   C. High blood pressure in pregnancy
   D. Asthma in pregnancy

4) Which of the following is a pre-conception healthcare intervention used around the world to prevent neural tube birth defects?
   A. Drinking a lot of water every day
   B. Taking folic acid pills as a supplement
   C. Taking aspirin tablets as a supplement
   D. Taking oral steroids such as prednisone

5) How long do you think you should prepare for a healthy pregnancy before trying to become pregnant?
   A. 6 months
   B. 1 year
   C. 1 month
   D. 3 months

6) Which of the following can you do to prepare for a healthy conception and pregnancy? (Choose all that apply)
   A. Stop drinking alcohol
   B. Stop using marijuana or tobacco in any form
   C. Get regular sleep every night
   D. Eat a healthy diet daily
7) What intervention is part of planning for conception?
   A. Talking with my partner so that we are in agreement about having a baby
   B. Taking care of my body by exercising regularly
   C. Seeing the dentist for my teeth and gums
   D. Getting caught up with any vaccines or immunizations

8) How much exercise should you get per week?
   A. 30 minutes per day 3 times per week
   B. 30 minutes per day 5 times per week
   C. 1 hour per day 3 times per week
   D. 1 hour per day 5 times per week

9) Would you be willing to incorporate this information into your reproductive family planning?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
APPENDIX D:

PROJECT TIMELINE
<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Planning</th>
<th>Pre-Implementation</th>
<th>Implementation</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 23, 2020</td>
<td>The pre-survey will be complete after development to assess baseline knowledge and interest of participants for pre-conception counseling.</td>
<td>The pre-survey will be reviewed with leading faculty of the project committee to omit or revise questions as necessary.</td>
<td>The pre-survey will be implemented by mid-July based on IRB approval.</td>
<td>Evaluation will be conducted immediately after administration of the pre-test.</td>
</tr>
<tr>
<td>May 15, 2020</td>
<td>The audiovisual presentation will be completed with all statistics and risks/benefits discussed of pre-conception counseling.</td>
<td>The audiovisual presentation will be reviewed with leading faculty of the project committee to omit or revise slides and information as necessary.</td>
<td>The audiovisual presentation will be implemented by the end of July based on IRB approval.</td>
<td>Evaluation will be conducted based on the pre- and post-tests.</td>
</tr>
<tr>
<td>June 1, 2020</td>
<td>The post-survey will be completed based on the information presented in the audiovisual presentation.</td>
<td>The post-survey will be reviewed with the leading faculty of the project committee to omit or revise content as necessary.</td>
<td>The post-survey will be implemented by the end of July based on IRB approval immediately following the presentation.</td>
<td>Statistical evaluation will be completed based on the difference in answers between the pre- and post-tests.</td>
</tr>
<tr>
<td>July 1, 2020</td>
<td>The IRB application will be complete after all components of the project have been put together and discussed with the committee.</td>
<td>The application will be reviewed with the leading faculty of the project committee to omit or revise information as necessary.</td>
<td>The application will be sent in by the end of this date for approval as soon as possible.</td>
<td>Evaluation and modifications will be completed based on IRB approval or denial.</td>
</tr>
<tr>
<td>June 2, 2020</td>
<td>The oral proposal project defense will be completed with the project committee.</td>
<td>The defense presentation will be reviewed with the committee chair to revise information as necessary.</td>
<td>The presentation will be graded immediately following the defense by the project committee.</td>
<td>Revisions will be made if necessary to pass the defense portion of the project.</td>
</tr>
<tr>
<td>July 25, 2020</td>
<td>The IRB application was approved in its entirety after revisions were made and the implementation phase</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
of the process could begin.

<table>
<thead>
<tr>
<th>Date</th>
<th></th>
<th>All informed consents will be given by those who are participating in all phases of the project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 15, 2020</td>
<td></td>
<td>All participants will have submitted their pre-surveys and post-surveys for data analysis.</td>
</tr>
<tr>
<td>September 1, 2020</td>
<td></td>
<td>The results were pulled from Qualtrics for analysis and descriptive statistics were used to analyze the data to determine if the education from the project was effective.</td>
</tr>
<tr>
<td>September 15, 2020</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E:

LITERATURE REVIEW GRID
Project Question: Will educating women of childbearing age on the importance of integrating pre-conception counseling and associated tools into their reproductive family planning be effective in improving their knowledge?

<table>
<thead>
<tr>
<th>Pub. Year; Author’s Last Name</th>
<th>Title of Publication</th>
<th>Type of Study</th>
<th>Main Outcomes of Findings</th>
<th>Support for and or Link to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffey &amp; Shorten, 2014</td>
<td>The challenge of preconception counseling: Using reproductive life planning in primary care</td>
<td>Case study</td>
<td>Barriers and challenges were identified in implementing pre-conceptual counseling in the primary care setting. This included funding for accessibility to women facing health disparities, as well as educating providers on the importance of preconceptual counseling and persuading them to incorporate preconceptual counseling into the primary care setting (Coffey &amp; Shorten, 2014).</td>
<td>Preconceptual counseling should be integrated as part of primary care to provide accessibility and higher qualities of care to women of ethnic minorities, low incomes, and women with complex health histories (Coffey &amp; Shorten, 2014).</td>
</tr>
<tr>
<td>Fischl et al., 2010</td>
<td>Impact of a preconception counseling program for teens with type 1 diabetes (READY-girls) on patient-provider interaction, resource utilization, and cost</td>
<td>Randomized control trial</td>
<td>43 teens were placed into the preconception counseling program while 45 received standard care. Statistically significant results were produced that showcased the teenagers’ expansion of knowledge regarding reproductive health and how to better manage their diabetes in the process. The cost in implementation of this program is far less than the cost of adverse pregnancy outcomes related to diabetes (Fischl et al., 2010).</td>
<td>The preconceptual counseling session once incorporated in primary care can be individualized to teenage women and their type 1 diabetes diagnosis. Questions regarding diabetes could be added to the contraceptive screening tool.</td>
</tr>
<tr>
<td>Fowler, J., Mahdy, H., Jack, B.W., 2019</td>
<td>Preconception counseling</td>
<td></td>
<td>Education regarding preconception counseling in the primary care setting is essential. These include chronic disease management and</td>
<td>This supports the necessity for individualized primary care education to each women of childbearing age wanting to</td>
</tr>
<tr>
<td>Pub. Year; Author’s Last Name</td>
<td>Title of Publication</td>
<td>Type of Study</td>
<td>Main Outcomes of Findings</td>
<td>Support for and or Link to Project</td>
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<tr>
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</tr>
<tr>
<td>Frayne, D.J., 2017</td>
<td>Preconception care is primary care: A call to action</td>
<td></td>
<td>how the pregnancy affects this. Furthermore, education should be individualized to each woman of childbearing age regarding genetic abnormalities, folic acid supplementation, short intervals between pregnancies, smoking cessation, alcohol use, obesity, malnourishment, toxin exposures, medication exposures, diabetic management, and infectious disease management (HIV, Hepatitis B etc.)</td>
<td>conceive to emphasize the importance of how their health status and history can drastically affect their pregnancy and ways to make an uncomplicated delivery more likely.</td>
</tr>
<tr>
<td>Hussein, Kai, &amp; Qureshi, 2016</td>
<td>The effects of preconception interventions on improving reproductive health and pregnancy outcomes in primary care: A systematic review</td>
<td>Systematic review incorporating eight randomized control trials regarding multifactorial contraceptive risk assessment</td>
<td>Four of the eight studies incorporated multifactorial risk assessment, while the other four studies involved single interventions, either educating on folic acid deficiency or abstinence from alcohol during pregnancy. The studies were too small to predict a relationship between preconceptual counseling and reduced adverse outcomes in pregnancy, however, compliance with care plans and appropriate</td>
<td>Preconceptual counseling in the primary care setting produces better self-efficacy and management of care plans for either low-risk or high-risk pregnancies (Hussein, Kai, &amp; Qureshi, 2016).</td>
</tr>
<tr>
<td>Pub. Year; Author’s Last Name</td>
<td>Title of Publication</td>
<td>Type of Study</td>
<td>Main Outcomes of Findings</td>
<td>Support for and or Link to Project</td>
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<tr>
<td><em>Hussein, Kai, &amp; Qureshi, 2016.</em></td>
<td>Healthy pregnancy choices were made in women who had received the preconceptual counseling</td>
<td>Qualitative study using survey to determine practitioners’ perspectives on preconceptual counseling in primary care</td>
<td>70% of survey participants were on board with implementing preconceptual counseling into their primary care practices. Only 4% of participants reported educating women of childbearing age on folic acid supplementation, while 1/3 of respondents said they educated their patients on alcohol avoidance in pregnancy (Kitamura, Fetters, &amp; Ban, 2005)</td>
<td>With specialized training for both existing providers and residents, these providers will be willing to incorporate preconceptual counseling into their primary care practices and reduce pregnancy complications (Kitamura et al., 2005).</td>
</tr>
<tr>
<td><em>Kitamura, Fetters, &amp; Ban, 2005</em></td>
<td>Preconception care by family physicians and general practitioners in Japan</td>
<td>Observational study; utilized to focus on clinical practice guideline development</td>
<td>Preconceptual counseling and education on necessary interventions individualized to each potential pregnancy are linked to an improvement in pregnancy outcomes, as well as compliance with prenatal visits (Leuzzi &amp; Scoles, 1996).</td>
<td>Guideline development regarding preconceptual counseling and education related to managing chronic illness during pregnancy is a necessary addition to preconceptual counseling (Leuzzi &amp; Scoles, 1996).</td>
</tr>
<tr>
<td><em>Leuzzi &amp; Scoles, 1996</em></td>
<td>Preconception counseling for the primary care physician</td>
<td>Case study</td>
<td>Benefits and challenges of hormonal contraceptives specific to women of childbearing age with inflammatory bowel disease were discussed. This includes an increased risk of venous thromboembolism, preterm delivery, and low birth weight. The</td>
<td>Education regarding the effects of inflammatory bowel disease is necessary as an addition to preconceptual counseling, while the use of hormonal therapy may be needed to combat pregnancy-related complications if patient</td>
</tr>
<tr>
<td>Pub. Year; Author’s Last Name</td>
<td>Title of Publication</td>
<td>Type of Study</td>
<td>Main Outcomes of Findings</td>
<td>Support for and or Link to Project</td>
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<tr>
<td>Moos, Bangdiwala, Meibohm, &amp; Cefalo, 1996</td>
<td>The impact of a preconceptual health promotion program on intendedness of pregnancy</td>
<td>Prospective experimental study</td>
<td>456 women out of 1378 women receiving prenatal care in the primary care setting were exposed to a family planning preconceptual counseling program to better prepare them for pregnancy. The experimental group had a 51.8% greater likelihood of intended pregnancy, as well as compliance to their developed plan of care in comparison to the patients non-exposed to the family planning program (Moos et al., 1996).</td>
<td>This reemphasizes the importance of preconceptual counseling and its assistance in reducing the extraordinarily high rate of unintended pregnancy (Moos et al., 1996).</td>
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<td>Raine-Bennett &amp; Rocca, 2015</td>
<td>Development of a brief questionnaire to assess contraceptive intent</td>
<td>Experimental study</td>
<td>A 15-item questionnaire was developed to identify degree of contraceptive intent and administered to 200 women ages 15-24. It determined to be a reliable tool, with a reliability coefficient of 0.73 in accurate assessment of contraceptive intent (Raine-Bennett &amp; Rocca, 2015).</td>
<td>This contraceptive intent assessment tool can be utilized in this project as a framework for the risk assessment of my own patients in clinicals. This can help guide areas of preconceptual counseling and determine levels of adherence to a developed preconceptual and prenatal plan (Raine-Bennett &amp; Rocca, 2015).</td>
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<tr>
<td>Pub. Year; Author’s Last Name</td>
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<td>Type of Study</td>
<td>Main Outcomes of Findings</td>
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<td>Sackey &amp; Blazey-Martin, 2019</td>
<td>The preconception office visit</td>
<td>Qualitative study</td>
<td>There are many barriers to delivering effective preconceptual counseling in the primary care setting including time constraints within the setting, lack of adequate resources to properly educate patients, and financial constraints to perform necessary screenings. Factors to promote smooth delivery of preconceptual counseling include conducting screenings on each woman of childbearing age on their desire to conceive and having informative posters and brochures in waiting areas discussing the benefits of preconceptual counseling.</td>
<td>This supports the need for preconceptual counseling in the primary care setting, but also provides weaknesses and barriers to successfully delivering preconceptual counseling which need to be reviewed when implementing a project for this purpose.</td>
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<tr>
<td>Tuomainen, Williams, &amp; Qureshi, 2013</td>
<td>Opportunities and challenges for enhancing preconceptual health in primary care: Qualitative study with women from ethnically diverse communities</td>
<td>Qualitative study</td>
<td>41 women of many diversities were screened via telephone interview to determine their knowledge baseline regarding preconceptual counseling. The women screened did not have thorough awareness of preconceptual counseling and its contributions to prevent unintended pregnancy, while also reducing adverse outcomes during the pregnancy. They also had a preference for female providers and held the belief of a strong support system in a significant other in order for them to feel</td>
<td>Knowing typical knowledge baselines of women of childbearing age can help guide the preconceptual counseling process for providers in conducting a basic assessment and starting with fundamental concepts before moving into more complex issues.</td>
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<td>Willhoite et al., 1993</td>
<td>The impact of preconception counseling on pregnancy outcomes: The experience of the Maine Diabetes in pregnancy program.</td>
<td>Experimental study; Randomized control trial</td>
<td>185 pregnancies were monitored, with 160 of them having mothers who had been diagnosed with gestational diabetes. A specialized diabetes preconceptual and prenatal counseling program was implemented and 62 of the 185 women who became pregnant participated in this program. Among the 62 pregnancies, 1 newborn had a congenital defect and there were 4 neonatal deaths. In contrast, in those who did not receive the preconceptual education program, 8 infants were born with congenital anomalies and 26 neonatal deaths occurred (Willhoite et al., 1993).</td>
<td>This supports the project by showcasing the effects of appropriate preconceptual counseling that can be adjusted depending on complexity of the mothers’ medical history. Furthermore, this should give emphasis of why preconceptual counseling is necessary in the primary care setting to prevent adverse events in pregnancy.</td>
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REFERENCES


