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Education Intervention of Preconception Screening in Primary Care

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Abstract

Problem: The risk of a poor pregnancy outcome among women of reproductive age in Providence, Rhode Island is indicated by the high rates of unintended pregnancies, low multivitamin use prior to pregnancy, obesity, and smoking. Although recommended, health professionals often fail to routinely screen and educate women of reproductive age for preconception risk factors. **Purpose:** Evaluate the efficacy of an educational intervention on preconception risk factors, lifestyle modifications, and current screening recommendations; and introduce a preconception tool and education sheet among a population of health care providers. **Method:** Preconception health material and a modified preconception screening tool was presented to seven primary care providers. A pre-test, post-test design was used to evaluate the effectiveness of the intervention, followed by an informal interview about current practices. Preconception referrals were compared two months prior and two months after the intervention. A follow-up survey was given to each provider. **Findings:** Although all of the providers agreed preconception screening is necessary, only two stated they screened all their patients of reproductive age. Four providers stated they could see themselves using the tool; however, barriers included time and frustration with another form. The posttest did indicate an increased provider knowledge in lifestyle modifications and risk factors for adverse pregnancy outcomes. Preconception referrals remained the same. The education sheet was made into a poster for each exam room following the intervention. **Conclusion:** The intervention was successful at educating providers on preconception risk factors and lifestyle modifications; however, mailing the preconception tool with the new patient packet could potentially increase sustainability in the future at this primary care facility.

Keywords: Preconception health, preconception screening, reproductive aged

Introduction and Background

The Centers for Disease Control and Prevention (2015) recommends screening and educating all men and women of reproductive age before conception to reduce fetal risks. Preconception counseling is also an important part of Healthy People 2020, which aims to increase the proportion of women who deliver a live birth and received preconception care services and practice key recommended preconception health behaviors (USDHHS, 2015). Using data from the 2004-2008 Pregnancy Risk Assessment Monitoring System (PRAMS) from Maine, New Jersey, Utah and Vermont, Williams, Zapata, D'angelo, Harrison, and Morrow (2012) discovered that only 32% of the 30,481 reproductive aged individuals reported they had received preconception counseling, with significantly low rates among those with unintended pregnancy. Preconception counseling was associated with positive maternal behaviors such as multivitamin consumption, first trimester prenatal care, and drinking cessation prior to pregnancy.

Half of pregnancies in the United States are unplanned and women often do not seek medical attention until several weeks into the first trimester, even though the developing fetus is most vulnerable 17 to 56 days after conception (CDC, 2015). In Rhode Island, 38.2% of pregnancies were unintended according to the PRAMS between 2009 and 2011 (Rhode Island Department of Health, 2014). Compared to mothers who had a planned pregnancy, unintended pregnancies were also associated with poorer pregnancy outcomes and 49.7% of those with an unintended pregnancy did not use any method of birth control. Obesity is also an escalating problem in Rhode Island. The percent of Rhode Island mothers who were obese prior to pregnancy increased from 15.1% to 19.5% between 2005 and 2011 (RDH, 2014). Overweight women have an increased risk for gestational diabetes, hypertension, preeclampsia, blood clots,

cesarean delivery and miscarriage or stillbirth and their babies have an increased risk for prematurity, congenital anomalies, macrosomia, and childhood obesity (March of Dimes, 2015). Of the Rhode Island women participating in PRAMS between 2009-2011, only 35.2 % took a multivitamin during the month prior to pregnancy, and 9.7 % smoked tobacco during pregnancy (RDH, 2014). These statistics suggest a possible disconnect between the patient and primary care provider

Problem Statement

The risk of a poor pregnancy outcome among women of reproductive age in Providence, Rhode Island is indicated by the high rates of unintended pregnancies, women not taking a multivitamin prior to pregnancy, obesity prior to pregnancy, and smoking during pregnancy; all of which are found to be associated with the lack of counseling. Although the Centers for Disease Control and Prevention (2015) recommends health professionals screen and educate all men and women of reproductive age about the steps to reduce risks, promote healthy lifestyles, and increase readiness for pregnancy, this is not routinely seen in practice. It is unclear if primary care providers are unaware of the recommendations or if time constraints contribute to lack of screening and counseling. Although preconception counseling is important for both men and women, the Women's Medicine Collaborative sees only women; therefore, this quality improvement project was limited to women only and involved an education intervention for primary care providers.

Review of the Literature

A comprehensive literature review of preconception interventions and tools included the following databases: Cumulative Index of Nursing and Allied Health Literature (CINAHL), and PubMed. The following Medical Support Headings (MeSH) terms included *preconception*

counseling primary care, Reproductive Life Plan and preconception and risk assessment intervention. The inclusion criteria was English language articles published in peer reviewed journals within the last five years, and limited to reproductive aged individuals 19 to 44 years old. Exclusion criteria was defined as non-English, outside the set timeframe or age parameters, antenatal and/or pregnancy care, singular disease specific studies, case studies and commentary articles. Thirty-one articles were retrieved from the above search. Of these articles, several related to preconception counseling and a single specific disease and therefore excluded. Duplicates and commentary articles were eliminated. In total, eleven research articles were relevant to preconception counseling interventions and selected for this review; one meta-analysis, two systemic reviews, two randomized control trials, one interventional cohort study, one pre and posttest design, one validation study, one qualitative/quantitative analysis, one survey design, and one analytic approach to a semi-structured interviews. The Johns Hopkins Nursing Evidence-Based Practice Research Appraisal (ANA, 2014) was used to analyze the level and strength of the research studies.

This literature review included several different methods of preconception screening and counseling. The Centers for Disease Control and Prevention (2015) recommends the Reproductive Life Plan as a framework for preconception counseling. The Reproductive Life Plan is a way for individuals to set reproductive goals and provides suggestions for healthcare professionals of ways to discuss preconception topics with their patients. Developed to assist providers in intergrading preconception health into primary care, the Georgia Preconception Screening tool includes patient questionnaires, educational brochures, and provider information. Computerized methods, such as the Virtual Patient Advocate “Gabby”, allows patients to

complete the screening questions prior to their visit and delivers education tailored to their personal needs.

Preconception Perceptions

In an attempt to introduce general preconception care into the primary healthcare system van der Zee, de Beaufort, Steegers and Denktas (2013) interviewed 16 women wishing to conceive about their thoughts of pre-pregnancy consultations. Although the women expressed positive attitudes towards preconception care, they were hesitant to seek preconception care themselves due to the belief they were not part of the intended target group. The study concluded the reasons for hesitation included perceived sufficient knowledge, perceived lack of risks, and misunderstanding of preconception care.

Reproductive Life Plan Information

A randomized control trial by Stern, Larsson, Kristiansson, & Tyden, (2013) revealed that women who received oral and written reproductive life information had a higher score on the follow-up questionnaire when compared to the two control groups. A similar pre and post counseling study by Mittal, Dandekar, and Hessler (2014), concluded that women with active diabetes, hypertension, or obesity demonstrated an increase in knowledge following the modified reproductive life plan counseling. A reproductive health self-assessment tool given to 22 patients at a community health center in Chicago, promoted patient participation and facilitated counseling according to both the participants and the providers (Bello, Adkins, Stulberg & Rao, 2013).

Preconception Care Toolkit

Based upon the recommendations adapted from the Georgia Preconception Care Toolkit for primary care providers, Dunlop, Logue, Thorne, and Badal (2013) tested the reproductive

health risk assessment questionnaire. The intervention cohort received brief counseling based upon identified risks and showed a substantial increase in knowledge about preconception health when compared to those in the control cohort who received only basic information. Dunlop, Dretler, Badal, and Logue (2013) used the same assessment tool followed by brief counseling. Reproductive risks were prevalent among the 150 African American women at a Women, Infants, and Children clinic and the vast majority of participants found the assessment and counseling to be acceptable and important.

Additional Pre-appointment Questionnaires

Gardiner et al. (2013) demonstrated that the “Virtual Patient Advocate” internet system “Gabby” was effective in inducing a positive behavior change in 24 reproductive aged women in the Boston area. An average of 23 preconception threats were identified from the preconception questions and 83% of the threats added to the “My Health To-Do List”, were later addressed by the participant. Routine assessment of pregnancy intentions and contraception use as an additional vital sign is another proposed intervention. Schwarz, Parsisi, Shevchik, & Hess (2012) established that internist who received their female patient’s pregnancy intentions and current contraceptive status prior to the office visit increased their documentation of contraception from 23% to 57%. The control group of internists received standard intake information and remained at 28% for contraception documentation. During visits involving a tetragenic prescription, documentation of contraception increased from 14% to 48% among the intervention group and decreased in the control group.

Reviews of Preconception Tools and Interventions

In a study supported by the Center for Disease Control and Prevention (CDC), Humphrey and Floyd (2012) completed a meta-analysis of preconception screening tools and interventions.

Their search of more than 3,500 reports from peer-reviewed literature abstracted 15 screening tools and interventions. The report concluded that the most thorough program was the Preconception Risk Assessment from the “Gabby” intervention, which included each factor of the CDC’s preconception care recommendations and nearly all topics within each area. The Preconception Care Toolkit however, covered the majority of recommended topics, and took approximately 1.1 minute to complete. Both Lassi, Majeed, Rashid, Yakoob, and Bhutta (2013) and Shannon, Alberg, Nacul, and Pashayan (2014) conducted systematic literature reviews and found that counseling on folic acid supplementation and managing diabetes prior to pregnancy where the most effective interventions to produce a positive fetal outcome. Pregnancy spacing, smoking and alcohol interventions, control of phenylketonuria, management of epilepsy and reduction of obesity were other priority discussion topics with the largest health impacts (Lassi et al, 2013; Shannon et al., 2014).

Strength of Evidence

According to the Johns Hopkins Nursing Evidence-Based Practice Research Appraisal (ANA, 2014), meta-analyses, systematic reviews and randomized control trials are level one or the highest strength of evidence. This review included two randomized control trials (RCT), one meta-analysis and two systematic reviews. The Dunlop, Logue, Thorne, and Badal (2013) interventional cohort study included five different clinics; however, the trial was nonrandomized, and only included low-income, non-pregnant African American and Hispanic women and therefore a level two in strength and may not be generalized to other populations. Although a cluster of RCTs, the Schwarz, E. B. Parsisi, S. M., Shevchik, G. J., Hess R. (2012) study took place in a single academic general internal medicine practice with an established and efficient electronic system, therefore findings may not be generalizable to all primary care settings.

Gardiner et al. (2013) had a small sample size and the health behaviors were self-reported, consequently leading to the possibility of inaccuracy. Mittal, Dandekar, and Hessler (2014) also had a small sample size of 27 women and did not use physiological measures to assess change. Two of the articles were a survey or interview design, and therefore a level three. This literature review addressed preconception screening and counseling for women only. The results, conclusions, and limitations were all clearly presented in each of the studies.

In summary, reproductive life plan counseling prior to pregnancy increased women's preconception knowledge (Stern, Larsson, Kristiansson, & Tyden, 2013; Mittal, Dandekar, & Hessler, 2014; Dunlop, Logue, Thorne, & Badal, 2013). The "Virtual Patient Advocate" internet system was successful in identifying preconception risk factors, and included each of the CDC's preconception care recommendations (Gardiner et al., 2013; Humphrey & Floyd, 2012). The most effective interventions to produce a positive fetal outcome were folic acid supplementation and managing diabetes prior to pregnancy. Although women express positive attitudes towards preconception care, they are hesitant to seek preconception care themselves (van der Zee, de Beaufort, Steegers & Denktas, 2013). For women who do not wish to conceive, documentation of contraception increased when internists received a report of their female patient's pregnancy intentions prior to their appointments (Schwarz, Parsisi, Shevchik and Hess (2012). Thus, the implantation and use of a preconception screening tool in primary care practice is supported by multiple studies indicating positive fetal outcomes when medical conditions are managed and risks are identified prior to pregnancy.

Theoretical Framework

The theoretical framework chosen for this project was Kotter's Change Theory (1995). Although this is a business model, his eight steps were essential to the successful implementation

of a preconception risk assessment in a primary care setting. Even though the evidence and recommendations are unmistakable, many primary care facilities do not routinely screen or counsel patients for preconception risks. Kotter (1995) discusses how leading change takes time and that skipping steps only creates an “illusion of speed and never produces a satisfying result” (p. 3). Each step is outlined in Table 1 with its relation to this DNP project aimed at quality improvement.

Table 1

Kotter’s Change Theory (1995) and Relation to Quality Improvement Project

1. <i>Establishing a sense of urgency</i>	Presented unintended pregnancy statistics to the staff will highlight that this is an urgent health care matter.
2. <i>Forming a powerful guiding coalition</i>	Assembled a group with enough power to lead the change is imperative to success, and this will include the director of the facility and the primary care director.
3. <i>Creating a vision</i>	Customized an existing screening tool with providers
4. <i>Communicate the vision</i>	Presented screening tool to primary care providers
5. <i>Empowering others to act on the vision</i>	Assisted the staff to implement screening tool into practice.
6. <i>Plan and create short-term wins</i>	Anticipated an increase in maternal health referrals for preconception counseling two months after the implementation.
7. <i>Consolidating improvements and producing still more change</i>	Administered survey after two months of implementation for provider feedback. Adjust screening tool as needed.
8. <i>Institutionalizing new approaches.</i>	All women of reproductive age are screened routinely. Articulating the connection between the success of the quality improvement project and the new staff behavior in a final report.

Project Design and Methods

To translate and evaluate existing evidence of preconception screening into practice, preconception health material and a modified preconception screening tool (*Appendix A*) was presented to seven primary care providers. Pre- and post-counseling surveys were administered to evaluate knowledge and attitudes about preconception screening. Many of the health related preconception questions such as current medications, past medical history, smoking status, alcohol/illicit drug abuse, contraception use, and domestic violence are already integrated in an annual physical exam. The tool was designed to assist the provider in asking additional preconception questions and referring to an appropriate specialist. Humphrey and Floyd (2012) claimed the Preconception Toolkit took 1.1 minutes to implement into practice and is therefore a reasonable recommendation. After presenting the Georgia Department of Community Health (2015) Preconception Toolkit to the directors (*Appendix B*), the modified screening tool (*Appendix A*) was developed to avoid question redundancy and meet the needs of the primary care providers. The tool was presented for the providers to use at their own discretion.

Setting and resources

This quality improvement project was implemented in the Primary Care department at a women's health clinic in Providence, Rhode Island. The staff was educated on the current national recommendations and the use of the screening tool. A patient education sheet developed by the Alabama Department of Public Health (2009) and recommended by the CDC, was presented as a patient handout (*Appendix C*).

Organizational analysis of project site. The facility offers a variety of services including Women's Primary Care, Obstetric and Gynecologic Medicine, Women's Behavior Medicine, Women's Gastrointestinal Medicine, Physical Therapy and Rehabilitation Services,

Pulmonary Medicine, Bone Density Testing and Bone Health, Lifestyle Medicine, Women's Cancer Services, and Women's Cardiovascular Medicine. Each specialty is operated by women, and exclusively for women. The Women's Primary Care office sees women for acute and chronic conditions and offers a wide range of services. The office has four female physicians, three nurse practitioner, and a nurse care manager. They accept Medicaid, Rite Care, and most major health insurance plans.

Population and community. Four female physicians and three female nurse practitioners were educated on the current preconception recommendations, national and local statistics, and the use of the screening tool. Providence County is comprised of 66.1% White, 18.8% Hispanic, and 7.2% African American individuals (US Census Bureau, 2010). Of the 488,469 individuals over 16 years of age, 37.8% are unemployed, and 11.9% of families are below poverty level. The primary care clinic see women ages 18 years and older. The target population for the preconception tool is women of reproductive age between 18 and 44 years old.

Goals, Objectives, and Expected Outcomes

The goals of this DNP project were to have increase in provider knowledge of preconception risk factors and lifestyle modifications, an increase in referrals for preconception counseling following the intervention, and to implement a preconception screening tool and education sheet at the primary care facility. See Table 2 for further discussion of objectives and expected outcomes.

Table 2

Project Goals, Objectives, and Expected Outcomes

Goals	Objectives	Expected Outcomes
Providers will have an increased knowledge of preconception risk factors and lifestyle modifications following an education intervention.	A preconception test will be administered before and after the education intervention (<i>Appendix D and E</i>).	50% of the providers will be able to accurately determine three preconception lifestyle modifications following the teaching intervention. 50% of the providers will be able to accurately determine three preconception risk factors following the teaching intervention.
Maternal medicine for preconception counseling referrals will increase by 50% two months following the quality improvement project.	A patient-administered questionnaire will be modified from the Georgia Department of Community Health (2015) Preconception Care Checklist. Questionnaire will be tailored for the primary care facility to avoid question redundancy.	Key stakeholders will approve the screening questionnaire by October 2015. The screening tool will be administered in the exam room prior to the scheduled encounter to all women of reproductive age.
Patients who wish to conceive in the future, will be given a preconception education sheet and offered a referral to an appropriate specialist for preconception counseling following the encounter.	A patient education sheet recommended by the CDC and developed by the Alabama Department of Public Health (2009) will be used.	Key stakeholders will approve of the patient education sheet by October 2015. There will be a 50% increase in maternal medicine/genetic counseling referrals two months following the implementation of preconception screening tool.

Implementation

Following approval of the DNP Project, the office manager scheduled a provider teaching intervention and notified the primary care providers of the upcoming event via email. The key stakeholders approved the modified preconception screening tool (Appendix A) based on the

Georgia Department of Community Health (2015) Preconception Care Checklist and patient education sheet (Appendix B) before the teaching intervention.

On the day of the teaching event, the providers were given a pretest to assess their knowledge of preconception health and current preconception screening practices (*Appendix D*). The teaching presentation included preconception statistics, national guidelines, and recommendations for the use of the questionnaire and education sheet. Following the teaching intervention, a posttest (*Appendix E*) was administered to evaluate the effectiveness of the education intervention.

The following qualitative approach was used during the implementation phase: an informal interview with the providers following the teaching intervention and a follow-up interview/survey two months after the intervention. The providers were asked their perception of the screening tool, what challenges they encounter with preconception screening, and their future recommendations (*Appendix F*). The following quantitative approach was used: collection all of the obstetric and maternal fetal medicine referrals two months prior to teaching intervention and two months after intervention. A staff member from the IT department provided a report from the computerized software system Epic for the selected dates and the numbers were compared.

To transform the climate of this organization and have future sustainability the key members must also believe in the proposed idea. The DNP project was intended to illustrate the importance of preconception screening. According to Issel (2014), impact evaluation is the projects long-term effect, where outcome evaluation is the immediate effect. In regards to the discussed problem, the immediate or outcome evaluation would be an increase in preconception counseling among those wishing to conceive. However, the impact evaluation outside this

practice would be a population of healthier women prior to conception and a decrease in unintended pregnancies, low-birth weight babies, birth defects, and fetal loss.

Cost-Benefit Analysis/Budget

The alternative or do nothing option is to continue asking the basic questions of an annual physical examination. The current template includes several important preconception questions such as past medical history, occupation, family history, vaccination status, history of sexually transmitted diseases, contraception use, tobacco and alcohol use, substance abuse, and domestic violence. The patient's weight and obesity risk are also addressed during the annual visit. The main concern with this current method is that several vital preconception questions are omitted. The modified preconception screening tool includes the patients desire to have a child, possibility of unintended pregnancy, prior adverse pregnancy outcomes/pregnancy complications, and risk for inherited genetic conditions; all of which are supported by the CDC (2015).

There are multiple user benefits to this modified preconception tool including provider reassurance that all of the recommended preconception questions are addressed. The tool also provides a standard course of action for identified red flags. Early referral to a specialist for known risks will potentially reduce the costs associated with poor fetal outcomes. Patients with the desire to conceive will benefit from the preconception education sheet, which includes a brief review of all of the CDC's recommendations. The total estimated cost for the teaching intervention and initial implementation of the preconception screening tool was \$56. The office manager scheduled the intervention prior to regular office hours and therefore did not interfere with paid work time. The user and patient benefits of the quality improvement project far outweighed the cost of implementation.

Table 3

Project Cost

Item	Cost
Material Resources	
Initial Printing Cost:	
• Provider pretest/posttest (20)	\$3.76 Black ink
• Patient questionnaire –color ink (20)	\$10.40 Color ink
• Patient education sheet –color ink (20)	\$10.40 Color ink
• CDC recommendations (100 pages)	\$9.40 Black ink
20 ball point ink pens	\$2.00 Pack of 10 (\$1.00 each)
Refreshments for presenting data	\$20.00 Muffins
Human Resources Cost	
Target audience paid time to attend	\$0 During designated lunch break
Capital Cost	
Space for presenting data	\$0 Office available in facility
Total Estimated Cost	
\$55.96	

Timeline

The expected timeline for project approval was November 2015, however due to several unexpected delays, approval and implementation began in January 2016. The data was collected and analyzed in March 2016 and the final report and results concluded in April 2016. Refer to Table 4 for simplified project timeline.

Table 4

Project Timeline

Task	Dec	Jan	Feb	March	April
Project Approval by facility	X				
Project Approval by university		X			
Teaching Intervention		X			
Tool Implementation		X	X	X	
Analysis of outcomes				X	
Assess referrals and survey				X	
Present results					X

Ethics and Human Subjects Protection

To protect the identity of the providers, the pretest and posttest were numbered and the provider's names were omitted. The facility's staff generated the referral trends two months before and two months after the implementation of the screening tool, and the patient's identification was not recorded or included. The patient education sheet included evidenced-based preconception health guidelines from the Alabama Department of Health. The University's Human Research Protection Office determined the project did not meet the federal regulation of human subject research, and therefore did not require a submission to the Institutional Review Board.

Results/Outcomes

Although all of the seven providers agreed preconception screening is necessary, only two stated they screened all their patients of reproductive age for risk factors, three stated they

did not screen all of their patients, one stated “briefly” and one stated she “tried to”. Current preconception practices included, assessing for contraception use at annual visit and educating those wishing to conceive with reproductive health information. When asked “do you see yourself using this preconception tool?” provider response included four yeses and three possibly in a different format. Potential barriers to the implementation of this screening tool included, time and frustration with completing another form. Provider knowledge increased following the teaching intervention. Table 5 and Table 6 illustrate the pretest and posttest answers.

Table 5

Provider response for lifestyle modifications prior to pregnancy

	Pretest	Posttest
Provider # 1	Diet Alcohol/Tobacco Stress management	Starting a prenatal /folic acid Manage DM Manage BP
Provider # 2	Healthy weight loss Stop smoking Healthy nutrition/ folic acid	Weight loss/healthy BMI Manage asthma, Type 2 DM Stop smoking
Provider # 3	Immunizations up to date Annual exam Exercise	Weight loss Exercise Start MVI 1 month prior
Provider # 4	Aim for BMI <25 Regular exercise Good nutrition	Regular exercise Weight loss if overweight Stop smoking
Provider # 5	Stop smoking Alcohol Stop teratogenic meds	Smoking, asthma control Alcohol, switch antidepressants Weight, beware lupus, thyroid, start MVI 1 month prior
Provider # 6	Weight loss Quit smoking Avoid alcohol Take folic acid	Weight loss BP control DM control
Provider # 7	Maintain healthy weight, BMI <25 BP control Diet	Weight loss HTN Multivitamin

Note. BP= blood pressure; BMI= body mass index; HTN= hypertension; MVI= multivitamin;
DM= Diabetes Mellitus

Table 6

Provider response for risk factors for adverse pregnancy outcomes

	Pretest	Posttest
Provider # 1	Diet Alcohol/Tobacco Stress Management	Obesity Uncontrolled DM Uncontrolled HTN
Provider # 2	Smoking Poorly controlled health condition Obesity	Unmanaged DM Obesity Smoking
Provider # 3	HTN Obesity DM	HTN Lupus DM
Provider # 4	Overweight HTN DM	Overweight DM HTN
Provider # 5	HTN DM Obesity	HTN, DM, Obesity, Lupus, Thyroid, Asthma
Provider # 6	HTN Type 2 DM Obesity	Obesity Type 2 DM HTN
Provider # 7	Alcohol Drug abuse High glucose	High blood sugar HTN Low folate

Note. BP= blood pressure; BMI= body mass index; HTN= hypertension; MVI= multivitamin; DM= Diabetes Mellitus

A short informal discussion was held following the teaching intervention. All providers agreed they automatically refer patients with Lupus who are pregnant or thinking about becoming pregnant. Asthma is usually something they manage without a referral, unless the condition becomes very severe. Obese patients present a challenge for most of the providers.

Although some refer to nutritionists, it was discussed how an obstetric medicine referral would be beneficial to stress the importance of a healthy weight prior to and during pregnancy. An option discussed for patients with psychiatric conditions included a referral to behavior health. All of the provider agreed patients with a history of preeclampsia should receive an obstetric medicine referral, however most providers manage hypertension themselves by switching patients from an angiotensin-converting-enzyme inhibitor or angiotensin receptor blocker to a beta blocker.

There were two referrals for preconception counseling in the two months *prior* to the teaching intervention and there were two referrals in the two months *following* the teaching intervention. There is no provider name listed on the preconception counseling referrals made prior to the intervention, therefore it is unclear if the provider who made the referral received the preconception education. The two providers who placed the referrals after the intervention were not at the education intervention. A total of 12 referrals for gestational diabetes were placed before the intervention and 12 after the intervention. It is unclear whether these referrals were made prior to conception or after a confirmed pregnancy. It is also unclear which providers made these referrals due to the omission of the provider's names on the report.

A follow-up interview was held two months after the teaching intervention during the regular office lunch break. The providers were notified via email from both the primary care director and office manager. One provider showed up for this interview. The provider expressed she normally screens her patients of reproductive age for alcohol and smoking use, and monitors their weight, and therefore has not changed her practice since the teaching intervention. She believed the screening tool is more beneficial for the patients to begin thinking about preconception health and suggested mailing it to the patients prior to their appointment. The

office manager collected the remaining surveys for the providers to complete at a convenient time. No surveys have been completed at this time.

Discussion

Facilitators and barriers

The key to forming a guiding coalition is to first involve individual representatives at the facility who have stake in the quality improvement project (Issel, 2013). Facilitators included the facility director, primary care director, and obstetric medicine director. Establishing a common goal among all team members assisted with the intervention success. Working closely with the primary care director, obstetric medicine director, and facility director, the Preconception Screening Tool (*Appendix A*) was revised several times to meet their needs. The validated Georgia Preconception Tool (*Appendix B*) was initially presented to the key stakeholders, however it was two full pages of questions and included several topics that are already discussed in the annual exam. After reviewing their annual exam template, the validated tool was modified to fit on one sheet and the format was adjusted to look more appealing. A staff member at the facility was able to assist with the arrangement, which made the tool easier to follow. A question was also added that addressed both heterosexual and homosexual individuals to meet the needs of all women involved.

The original plan for this quality improvement project was to implement the preconception screening tool during the annual visit for all 100 women of reproductive age. The key stakeholders agreed on the modified preconception tool, however, the primary care providers were concerned the tool would “hijack” the appointment, taking time to go over the preconception tool during an already busy annual exam. It was then suggested that a pilot study of the preconception tool be implemented instead. The providers would be notified via an

electronic message if there were any identified preconception risk factors to address at a convenient time. Barriers to this plan included project timeline and having access to the patient's medical records. The facility and University later approved the provider teaching intervention. The preconception screening tool was presented as a suggestion for the providers to use at their discretion.

Predicted barriers included reduced provider and staff interest in the screening tool after the education intervention. Another predicted barrier was time. The patients are already completing several other forms in the waiting room and the providers are already counseling on several other topics during a well patient exam. To address these barriers, it was suggested that the patient complete the screening tool (*Appendix A*) at the annual visit in the waiting room and the risks factors can be addressed at a later date. Due to lack of follow-up response, it is unclear whether any of the providers have used the screening tool.

The providers all received a folder at the beginning of the teaching intervention that included the pretest, posttest, preconception tool, patient education sheet, and a preconception health information packet. Since the pretests were not collected prior the start of the teaching, it is possible that the providers changed or added to their answers on the pretest following the intervention. The posttests however did show an increase in provider knowledge, in that 100% of the providers were able to correctly list at least one different lifestyle modification and 70% were able to correctly list a different risk factor. This exceeded the projects goal.

The original plan was to give to each patient of reproductive age the patient education sheet, instead a poster was made for each exam room (*Appendix C*). Patients often have time to read these posters while waiting for the provider. The actual cost of the quality improvement

project was higher than the expected cost. The original estimated cost was \$55.96; however, the food for the presentation was \$20.00 more raising the total cost to \$75.96.

Preconception referrals did not contribute to the success or failure of this DNP Project. Preconception referrals remained the same. All of the referrals for gestational diabetes did not have a referring provider listed. It cannot be confirmed which provider made the referrals and therefore it is unknown whether the provider received the preconception education. According to the IT department if the provider enters a referral themselves, their name will be listed on the report along with the reason for the referral. If another staff member enters the referral the providers name is omitted. As mentioned earlier, it is also unclear if the referrals for gestational diabetes were placed prior to conception.

During the follow-up interview, the contributing provider suggested mailing the preconception screening tool with the new patient packet. This would give the patient adequate time to complete the form, and the provider time to review and address the risk factors prior to the initial meeting. Completing the screening tool may also prompt the patient to seek preconception counseling. This will be recommended to the directors for future sustainability of the preconception tool at this practice.

Conclusion

The recommendations that are proposed by the CDC (2015) and the United States Department of Health and Human Services (2015) concerning preconception screening and counseling are appropriate tasks for primary care providers. The stated literature review has proven the goal is feasible and beneficial to translate into practice. Even though the evidence and recommendations are unmistakable, most of the primary care providers stated they did not routinely screen patients for important preconception risks. Many of the health related

preconception questions such as current medications, past medical history, smoking status, alcohol/illicit drug abuse, contraception use, and domestic violence are already intergraded in an annual physical exam. This tool is a cost-effective way to assist the provider in asking additional questions that are essential to optimizing preconception health and with referral to an appropriate specialist. Provider knowledge of preconception health increased following the teaching intervention, however due to lack of provider response on the follow-up survey and no increase in preconception referrals it is unclear whether the intervention led to a change in their daily practice. Mailing the preconception tool with the new patient packet could potentially increase sustainability in the future at this primary care office. Ultimately, the capacity to improve the lives of individual patients requires long-term sustained efforts by providers and actions by patients themselves to effect change. The education poster in each exam room will continue to inform patients of essential preconception recommendations at this facility.

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Appendix A

Name:

Preconception Screening Tool

In an effort to optimize preconception health, the Women's Medicine Collaborative is committed to screening all women of reproductive age. Preconception health is an essential step in reducing the chances of birth defects, fetal loss, low birth weight, preterm delivery, and unintended pregnancies.

1. Do you desire a child now, within the next year, or in a year or more?	<input type="checkbox"/> <i>Yes</i>	<input type="checkbox"/> <i>Unsure</i>	<input type="checkbox"/> <i>No</i>
2. Are you currently sexually active?	<input type="checkbox"/> <i>Yes with women</i>	<input type="checkbox"/> <i>Yes with men</i>	<input type="checkbox"/> <i>No</i>
3. Do you use contraception?	<input type="checkbox"/> <i>Never</i>	<input type="checkbox"/> <i>Sometimes</i>	<input type="checkbox"/> <i>Always</i>
4. If so what method of contraception? (please write in)			

If you answered *Yes or Unsure* to questions 1 and 2 please continue with questions 5 – 7

5. Do you have a history of a prior adverse pregnancy outcome or prior pregnancy complications such as: (Please check all that apply)

- Miscarriage
- Preterm birth
- Stillbirth
- Abnormality of uterus
- Gestational diabetes
- Hypertension

6. Do you or does anyone in your family have a history of genetic disorders? If so please list.

7. Do you currently have any of the following medical conditions? (Please check all that apply)

- Diabetes
- High blood pressure
- Thyroid disease
- Seizures
- Lupus
- Asthma
- Depression
- Rheumatoid Arthritis
- Overweight

For Provider Use Only:

Possibility of unintended pregnancy

- Counseled on contraception use

Patients with preconception risk factors

- Counseled on preconception health
- Referred for genetic counseling
- Referred to obstetric medicine

Appendix B



“Every Woman, Every Time” Preconception Care Checklist for _____ (year)
 Complete for ALL women of reproductive age at least annually

Reproductive plan assessed Desires a child: Now Within the next year
 Not for a year or more Not ever (or ever again)
 Unsure or doesn't know

Current Contraceptive Method (*write-in*): _____ None

<u>Risk factor</u>	<u>Assessed</u>	<u>Risk identified</u>	<u>Action undertaken</u>
Possibility of unintended pregnancy contraception ^d	<input type="checkbox"/> ^a	<input type="checkbox"/>	<input type="checkbox"/> Counseled re: risk and <input type="checkbox"/> Patient accepted contraception
Sexually-transmitted infections	<input type="checkbox"/> ^{a,b}	<input type="checkbox"/>	<input type="checkbox"/> Counseled re: protection ^d <input type="checkbox"/> Performed STI screening
Prior adverse pregnancy outcome Specify:	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Counseled re: risk recurrence <input type="checkbox"/> Maternal-fetal medicine referral
Prior pregnancy complications Specify: referral	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Actions: <input type="checkbox"/> Maternal-fetal medicine
Risk of inherited condition Specify:	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Counseled <input type="checkbox"/> Genetics referral
Occupational/hobby exposures Specify:	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Counseled <input type="checkbox"/> Occupational health referral
Folic acid 400 mcg daily	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Counseled, recommended supplement
Raw/rare/unpasteurized foods	<input type="checkbox"/> ^b	<input type="checkbox"/>	<input type="checkbox"/> Counseled
Tobacco use Details:	<input type="checkbox"/> ^c	<input type="checkbox"/>	<input type="checkbox"/> Counseled ^d <input type="checkbox"/> Quitline 877-270-7867 <input type="checkbox"/> Link to local resource:
Alcohol use 6745 Details:	<input type="checkbox"/> ^c	<input type="checkbox"/>	<input type="checkbox"/> Counseled ^d <input type="checkbox"/> Hot line 800-338- <input type="checkbox"/> Link to local resource:

Illicit substance use	<input type="checkbox"/> ^c	<input type="checkbox"/>	<input type="checkbox"/> Counseled ^d <input type="checkbox"/> Hot line 800-338-6745
Details:			<input type="checkbox"/> Georgia Power line 800-822-2539 <input type="checkbox"/> Link to local resource:
Domestic violence	<input type="checkbox"/> ^c	<input type="checkbox"/>	<input type="checkbox"/> Counseled ^d <input type="checkbox"/> Hot line 800-33HAVEN <input type="checkbox"/> Link to local resource:
Incomplete vaccination status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Updated vaccinations:
Specify:			
Poor oral health/dental concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Georgia Power line 800-822-2539 <input type="checkbox"/> Referral:

Medical problems (*circle*) **Action undertaken**

DM HTN Other: Counseled re: importance of planning for pregnancy with provider

Thyroid Seizure Counseled re: need to optimize disease control pre-pregnancy

Depression SLE

Medications of concern (*list*) **Action under taken**

Counseled re: need to change medications pre-pregnancy

Counseled re: contraception while using a medication

^a
Tool: *Your reproductive plan*

^c
Tool: *Reproductive health interview*

^b
Tool: *Reproductive health questions*

^d
Tool: *Guide to patient counseling resources*

Appendix C

Birth control – Pick the one that is right for you.
Use it until you are ready to get pregnant.

Each pregnancy should be at least two years apart.
Give your body time to heal and recover.

Rest. Relax. Lower your stress.

Exercise regularly. Avoid extreme diets.
Plan to eat right and keep a healthy weight.

Ask about the shots you may need.

Don't forget to see your healthcare provider for regular
check-ups and dental visits before you get pregnant.

You are in control. Know your risk for STDs and HIV. Get tested!

Plan your family budget. Be ready for the extra cost of a new baby.

Learn how to manage your health problems
such as high blood pressure and diabetes.

Avoid chemicals or harmful substances at home
and work such as lead, mercury, or pesticides.

Newborn risk – If you had a baby born early or underweight, your
next baby may be at risk. See your doctor early if you get pregnant.

Add 400 mcg of folic acid to your diet now before
you get pregnant to help prevent birth defects.

History – Know your medical and family history for high
blood pressure, diabetes, and other health problems.

Evaluate your and your partner's family history of genetic disorders
such as Cystic Fibrosis, Muscular Dystrophy, Sickle Cell Disease, etc.

Ask for help if you are in an unsafe or violent situation.

Don't smoke, drink alcohol or take drugs!

Appendix D

Education Intervention Pretest

1. Do you think preconception screening is necessary in the primary care setting?

2. Do you screen all your patients of reproductive age for preconception risk factors?

3. What are your current preconception screening practices?
 - None
 - Assess for contraceptive use at annual visit
 - Educate those wishing to conceive with reproductive health information

4. Name three lifestyle modifications women should begin prior to becoming pregnant.

5. Name three risk factors for adverse pregnancy outcomes.

