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# Educated Birth: Beliefs vs. Outcomes

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# Educated Birth: Beliefs vs. Outcomes

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*Educated Birth: Beliefs vs. Outcomes*

“Our infant mortality rate is a national embarrassment.”<sup>1</sup> The words seem shocking and harsh across the headline of a 2014 Washington Post article. The thought of the United States not being the best at something, but falling upsettingly behind, is a foreign concept to many who view the U.S. as a nation inferior to none. However, the statistics on infant mortality rate tell the stark truth that of 26 “wealthy” countries, the U.S. ranks last, with a sobering 6.1 deaths per 1,000 live infant births.<sup>2</sup>

A 2014 National Vital Statistics Report sheds light on some of the proposed explanations of such a gap between countries like Finland, Japan, and Sweden who have approximately 2.5 deaths per 1,000 infant births or less and the United States which stands at nearly triple that number. The report examined differences in definitions of stillbirth, miscarriage, and live birth across these countries and found that many countries define infant death before 24 weeks as a stillbirth whereas the United States would record this as a true infant death, counted into the infant mortality statistic and thus inflating the number.<sup>2</sup> However, when accounting for this factor, The United States is still left standing at nearly double the infant mortality rate of the top-ranking countries. So though the statistics may not be as distressing as we initially feared, there is still progress to be made to promote optimal birth and neonatal outcomes.

One of the Healthy People 2020 Objectives is to reduce the rate of infant deaths within one year.<sup>3</sup> There are many other objectives aimed at improving health before, during, and after

pregnancy for both mother and baby, which will serve to achieve a lower infant mortality rate as well.

With many of these goals, a key component for achievement lies within the power of the individual, making healthy lifestyle choices before, during, and after pregnancy and being educated about current health information. However, with a vast range of information available from an almost infinite number of sources, individuals can be left wading through mounds of unreliable sources to try to make informed decisions regarding their health and care before and during pregnancy.

The National Center for Health Statistics estimated in 2011 that 61% of U.S. adults have used the Internet to look up health or medical information.<sup>4</sup> Furthermore, the *Maternal and Child Health Journal* reported that 94% of women surveyed said they had used the Internet for information about pregnancy and birth.<sup>5</sup> Nearly 98% of these women use search engines to find information, which may or may not result in the use of reliable sources. Among teens and young adults, social media sites like Facebook, YouTube, and Twitter are becoming trusted sources of health information.<sup>6</sup> With this, it is important for greater accessibility to health education programs that place an emphasis on training consumers how to find reliable medical information in order to make informed decisions about their own care.

Regarding the topic of maternal, neonatal, and infant health, an important question to ask is how much of the knowledge that women giving birth possess comes from reliable sources? Even further, how much of the information that is reliable is actually understood or

interpreted correctly? The objective of this project is to discover what beliefs and knowledge women have regarding pregnancy and birth and if this information lines up with the latest evidence-based research.

The results of this study will shed light on a potential need for greater availability of health education programs and empowerment for women to find and interpret reliable information regarding their pre- and perinatal care and therefore make informed decisions that will ultimately lead to greater maternal health surround birth as well as decreased infant mortality in the United States.

### *Methods and Materials*

#### Subjects

The subjects for this project are female freshmen at the University of Arkansas. By freshman year of college, over 50% of females have become sexually active and by senior year, nearly 90% have.<sup>7,8</sup> College women ages 20 to 24 have one of the highest rates of unintended pregnancy in the United States, with a number that has not significantly declined in the past decade.<sup>8</sup> College students have expressed a desire to gain more information on the risks and benefits associated with different birthing methods and procedures and also expressed a fear of pain in childbirth.<sup>9</sup> This data suggests that there is both a need for more information surrounding pregnancy and birth and a desire for this information among college females. For this reason, female freshman are the subjects for this project. Limiting the sample population to freshmen rather than all college females was advantageous in maintaining a more specific and manageable scope for this project.

Subjects were asked questions to identify their age, area of study, and if they had ever given birth. I received 189 responses to this survey. After excluding surveys that did not fall under the category of freshman women who had never given birth, there were 158 responses. One-hundred percent of respondents were 18 to 20 years old. When asked about their area of study, the breakdown was as follows, with 4 respondents choosing not to answer:

#	Answer	Response	%
1	Arts	6	4%
2	Education	10	6%
3	Sciences	43	28%
4	Engineering	15	10%
5	Business	32	21%
6	Humanities	11	7%
7	Human Environmental Sciences	6	4%
8	Design	3	2%
9	Other	28	18%
	Total	154	100%

*Figure 1. Breakdown of participants by area of study.*

### *Survey Design*

After questions about age, gender, year in college, and area of study, participants were asked to answer questions regarding their beliefs about health during pregnancy and birth. Six questions asked participants to rank their level of agreement with a series of statements about different birthing practices. The remaining two questions asked participants to choose answers from a list of several options about what micronutrients are needed during pregnancy for optimal birth outcomes and what factors may contribute to pre-term birth. Qualtrics survey software was used to create and analyze the survey data from this survey.

*Further Study*

Using the responses from the survey, the answers that female freshmen give about birth will be compared with current research studies to determine whether the beliefs and knowledge freshman women at the University of Arkansas match the evidence. The survey will be broken down question by question to analyze knowledge about each topic touched on in this survey, with a detailed background and literature review for each topic.

*Results and Discussion*

*Question 1: Rate the degree to which you agree or disagree with the following statement:*

*It is safe for a woman to eat or drink during labor.*



Students' opinion on this question leaned heavily against eating or drinking during labor, with 47% of respondents either disagreeing or strongly disagreeing with the statement

that it is safe for a woman to eat or drink during labor. With nearly 34% of students neither agreeing nor disagreeing, only 17% agreed with this statement. This may be due to the common practice among hospitals of not allowing women to eat or drink once they have been admitted to the hospital for labor.

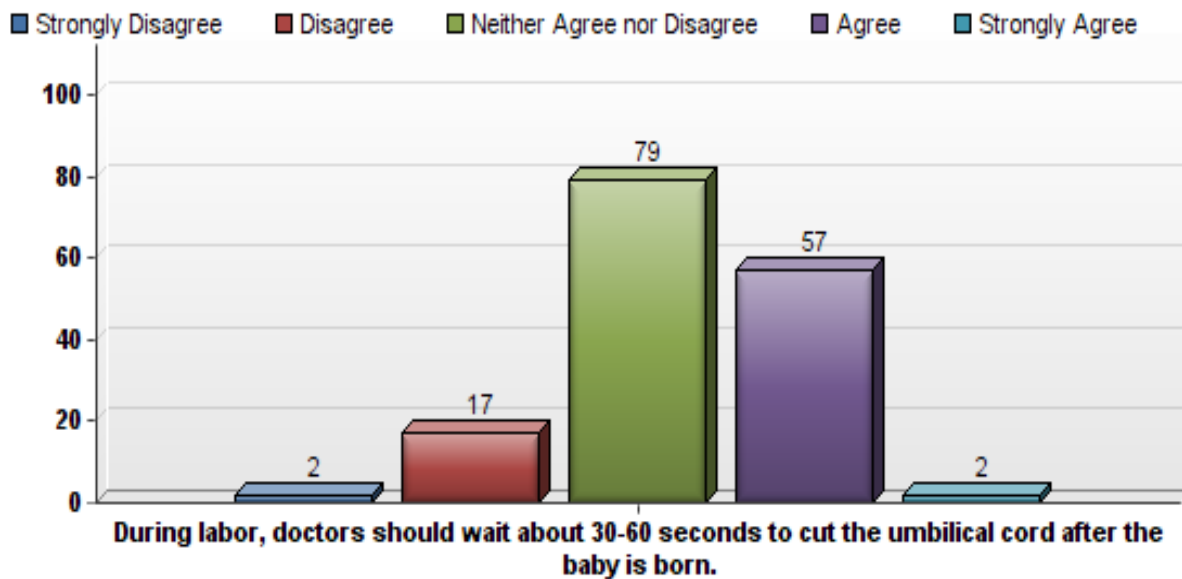
The practice of not allowing women to have anything more than ice chips while in labor at the hospital comes from a study done in the 1940s that revealed the risk of aspirating the contents of the stomach into the lungs while under general anesthesia during childbirth.<sup>10</sup> This study identified the serious complications that could result from this situation. However, recent studies have begun to revisit this topic and analyze the benefits and risks of allowing women to eat or drink while in labor. Because hospitals now typically use a regional anesthesia for cesarean sections, these reports have asserted that the restriction of food and drink may be unwarranted. A study in 2013 by the Cochrane Library found that between women who were restricted from eating or drink during labor and those who were not restricted, there were no differences in outcomes.<sup>11</sup> In fact, many hospitals worldwide are slowly beginning to give women more freedom to choose whether or not they would like to eat or drink during the labor process, as there is a lack of current evidence suggesting any risk in doing so.<sup>11,12</sup>

This question provides great insight into the need for future mothers to think critically about their care and be trained in finding reliable sources to support their decisions for health care during pregnancy and childbirth. As advances are made in the medical world,



routine practice may change as well, and it is important for patients to stay up to date on what the best care practices include at that time.

Question 2: Rate the degree to which you agree or disagree with the following statement:  
During labor, doctors should wait about 30---60 seconds to cut the umbilical cord after the baby is born.



In response to this question, 50% of students reported that they neither agreed nor disagreed. This suggests that perhaps there is a lack of knowledge on this topic or a lesser value placed on it. However, over 37% showed agreement with this statement, with only 12% in disagreement. Overall, the answers to this question were very moderate, with a variance of only 0.51. This supports the theory that there may be a lack of knowledge in this area.

There is a wealth of new research booming that is attempting to answer what timing is ideal for optimal outcomes for different groups of mothers and newborns. The most concrete evidence has been that delayed cord clamping of at least 30 seconds after birth has a significant impact on the health of preterm infants.<sup>13</sup> Some of these benefits include increased hematocrit and hemoglobin levels for infants during the early neonatal period, increased blood volume, decreased need for inotropic medications, decreased need for blood transfusions for anemia, reduced occurrence of intraventricular hemorrhage, improved heart function, improved cerebral oxygenation, and an increased transfer of autologous stem cells.<sup>14</sup> The only adverse outcome associated with a delay in clamping the umbilical cord is the incidence of neonatal jaundice. However, most studies consider this to be of less concern in hospitals with readily available phototherapy for newborns with jaundice. The benefits of clamping the cord after 30 seconds in the case of preterm infants outweigh the risks.

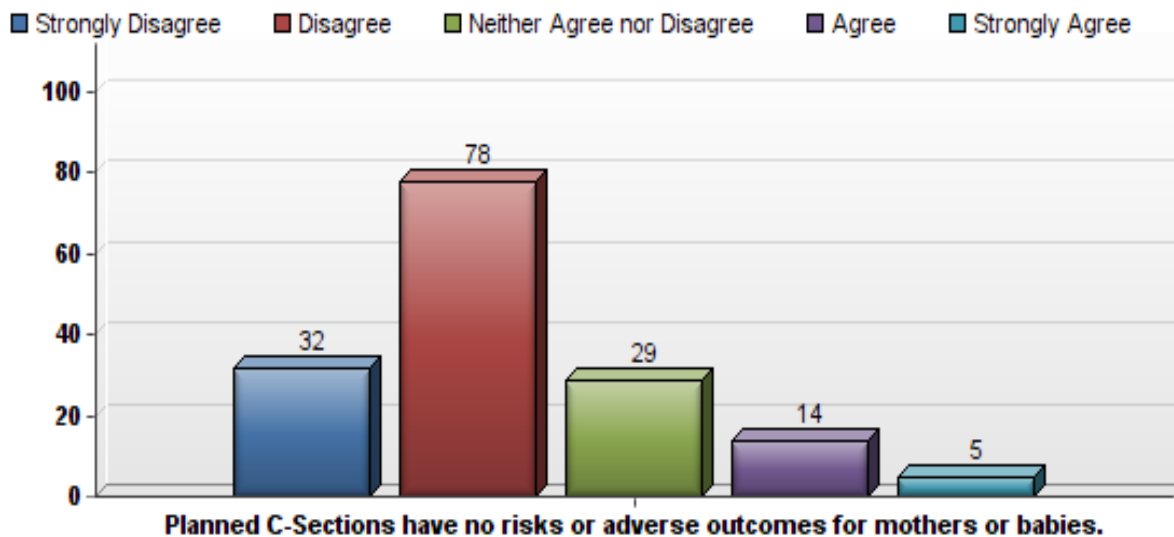
For full term infants, the outcomes are less clear and more research is needed. There are many studies revealing several benefits of delayed clamping for term infants as well, such as higher total body iron stores at two to four months of age and a lower incidence of iron-deficiency anemia at about 4 months of age.<sup>14</sup> Some find this research very convincing and are adopting the common practice of delaying cord clamping while others may only choose to carry this out for pre-term infants.

The survey responses to this question may be appropriate in light of the pending research.

In a situation such as this one, where much research is being carried out and decisions can be made on either side of the coin without an increased risk of adverse effects, women should have adequate training in how to sort through the most current research and make a well-informed personal decision regarding her care.

*Question 3: Rate the degree to which you agree or disagree with the following statement:*

*Planned C-sections have no risks or adverse outcomes for mothers or babies.*



An overwhelming majority (~70%) of respondents disagreed with the statement that planned C-sections have no risks or adverse outcomes for mothers or babies. Only 12% of respondents reported agreement with this statement. Multiple studies have shown that a low number of women actually prefer or request a cesarean section, likely due to the knowledge of risks or adverse outcomes involved.<sup>15,16</sup> However, though most women

would prefer not to have a C-section, in 2013 the cesarean section rate for births in

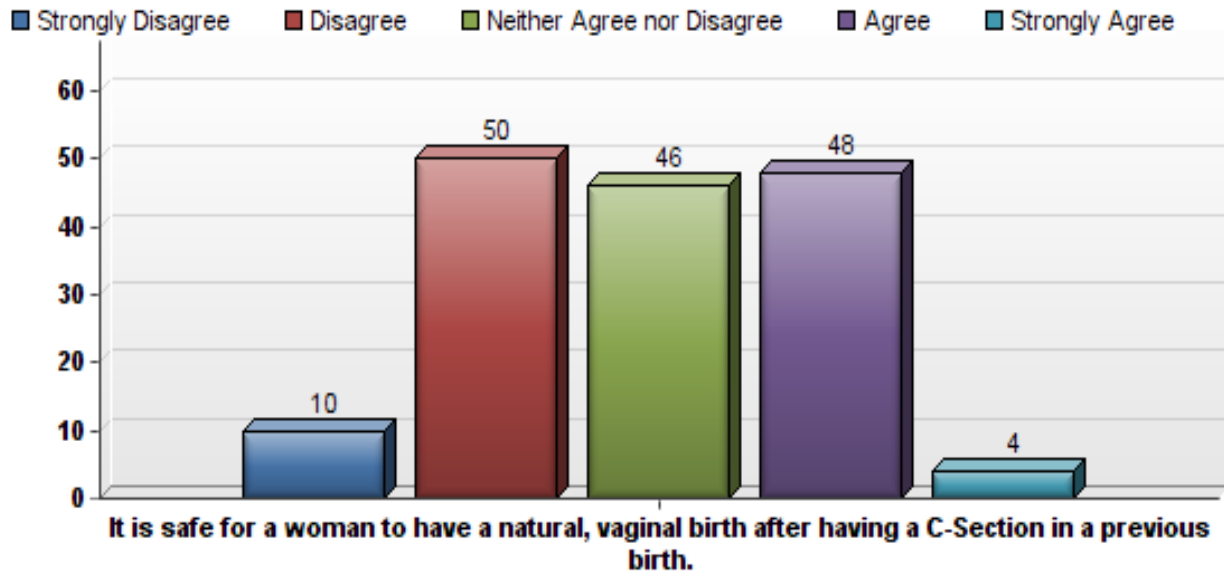
The U.S. was over 32%.

Healthy People 2020 aims one of the objectives at reducing the rates of cesarean birth among U.S. women. It is critical for women to have evidence behind their desire to have a vaginal birth so that they can advocate for themselves in order to have the birth experience they want, if medically possible.

Some of the risks of planned cesarean sections include a longer maternal hospital stay, surgical complications, increased risk of respiratory problems for the infant, higher cost, and increased risk of further issues in later pregnancies.<sup>17, 18</sup> If women are able to clearly express to themselves and others why they do not desire a cesarean section they may be more likely to cope with and overcome the fear of pain associated with vaginal birth that causes many women to choose a C-section.<sup>19, 20</sup> Counseling may also help alleviate the fears associated with birth so that women can achieve a vaginal birth without fear.<sup>20</sup>

*Question 4: Rate the degree to which you agree or disagree with the following statement:*

*It is safe for a woman to have a natural, vaginal birth after having a C-section in a previous birth.*



There was a fairly even spread between agreement and disagreement with this statement. Very few respondents expressed strong beliefs concerning the topic, with only 9% strongly disagreeing or strongly agreeing. Of those who had a strong belief concerning VBAC (Vaginal birth after Cesarean), the majority sided against its safety for the mother.

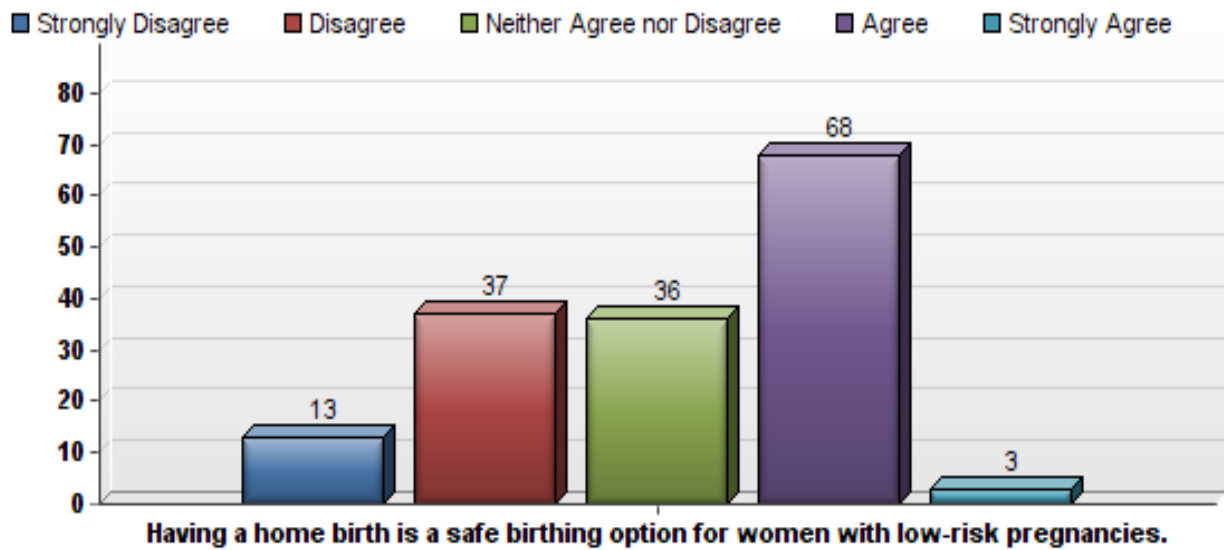
With nearly 38% reporting that a VBAC is not a safe option for mothers, it seems that there must be some knowledge of the continuing effects of a cesarean section on a woman’s body. Research shows that women who previously gave birth by cesarean are more likely to experience uterine rupture in an attempted vaginal birth.<sup>21</sup> This happens when the uterus tears along the scar-line from a previous cesarean. In this case, the mother will likely have to go into an emergency C-section to prevent further complications. Though this can be a

serious issue in an attempted vaginal birth after cesarean, it is a relatively uncommon occurrence, with less than 1 out of 100 women attempting VBAC experiencing uterine rupture.<sup>22</sup>

In women who plan to have multiple births, a VBAC might be the best option, as multiple cesarean sections increase risks for adverse effects with each additional occurrence.<sup>22</sup> So though a vaginal birth after a cesarean section may require extra monitoring and counseling with health care professionals, many advances have been made that make it a much safer possibility for mothers who do not wish to have another cesarean section. Because most C-sections are accomplished using a low transverse incision, the risk of uterine rupture is lower than with the classical vertical incision. Mothers attempting a VBAC should have extra monitoring and care, but for these women who desire to have a vaginal birth after cesarean section, this can be a safe, successful, and satisfying option.

*Question 5: Rate the degree to which you agree or disagree with the following statement:*

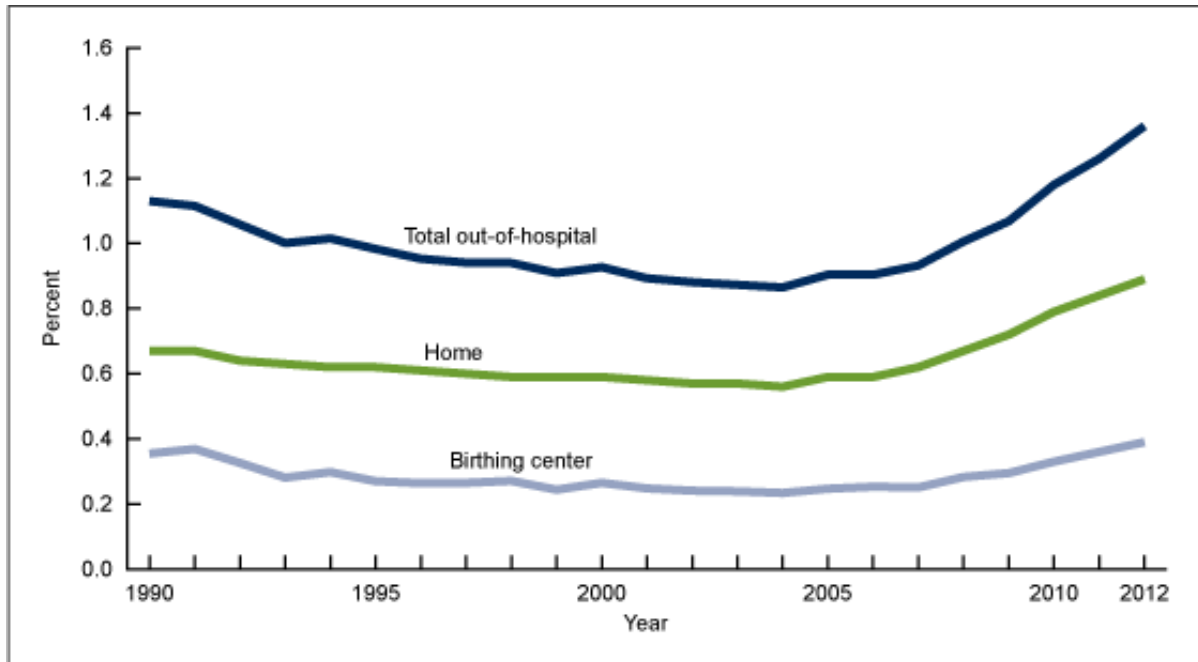
*Having a home birth is a safe birthing option for women with low-risk pregnancies.*



Nearly 45% of respondents agreed that having a home birth is a safe birthing option for women with low-risk pregnancies. However, though many agreed with this statement, only 3 respondents strongly agreed, showing some element of pre-caution. Almost one-third of respondents disagreed with the statement and the remaining 22% neither agreed nor disagreed.

In the past 5 to 7 years, the U.S. has seen a steady increase in the frequency of out-of-hospital births, including home birth.<sup>23</sup> This has been accompanied with an improved system of risk profiling, screening patients for any possible high-risk factors that could contribute to

complications during birth.



*Trends in out-of-hospital births in The United States from 1990-2012 Source: CDC/NCHS*

Several recent studies have explored the safety of planned home birth in the United States compared with hospital birth. A 2014 landmark study of nearly 17,000 women who planned a home birth between 2004 and 2009 found that there were very high rates of physiologic birth and combined with low rates of intervention and no increase in adverse outcomes for mother or baby.<sup>24</sup> Another study including births in British Columbia, Canada found that planned home birth attended by a midwife or physician had comparable perinatal mortality rates and lower rates of interventions and other adverse perinatal outcomes.<sup>25</sup>

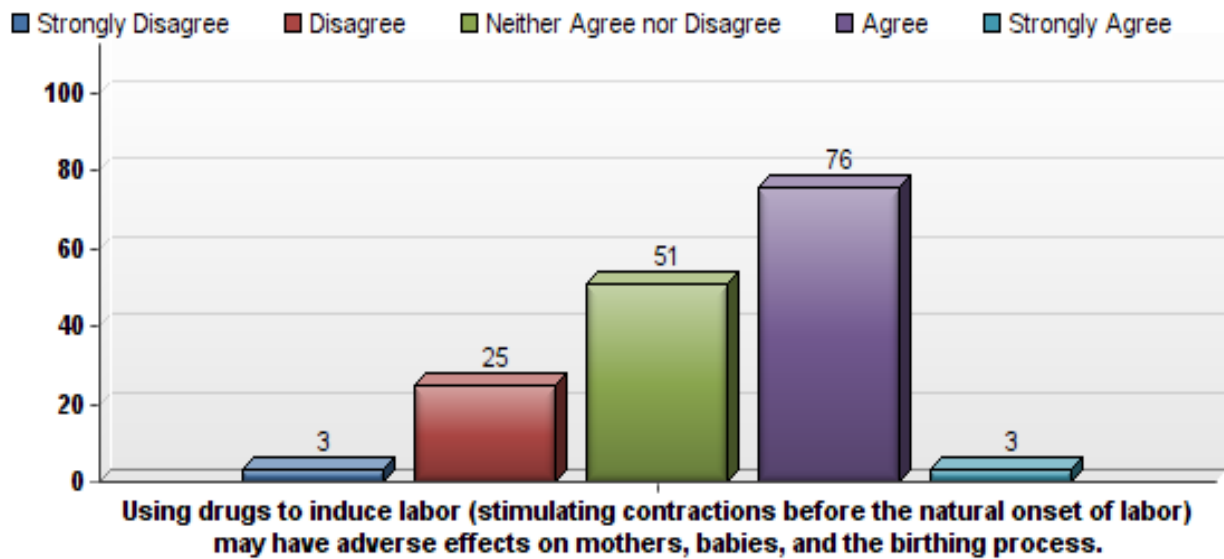


However, there is much controversy concerning home birth in the U.S., meaning this is a critical area for women to have knowledge on how to find evidence-based research to support and advocate for their personal birth care model. Further than finding research, however, women need to be counseled and trained in how to make discernments between conflicting evidence. An example of such discrepancies is found in the difference of opinion between the American College of Obstetrics and Gynecology and the Royal College of Obstetrics and Gynecology (Based primarily in the UK). The American College approaches homebirth with extreme caution, recognizing that the absolute risk of neonatal death involved is very low (2 in 1,000 births), the relative risk is double that of planned hospital birth (1 in 1,000 births).<sup>26</sup> However, the Royal College is much quicker to express its support of home birth, especially for 2<sup>nd</sup> and 3<sup>rd</sup> time mothers.<sup>27</sup>

Though research provides evidence that the absolute risk involved with home birth is low, there is still much hesitation toward birth at home, as demonstrated from this project's survey of students. For this reason, it is important to teach women how to analyze research and data to make informed and responsible decisions regarding their care.

*Question 6: Rate the degree to which you agree or disagree with the following statement:*

*Using drugs to induce labor (stimulating contractions before the natural onset of labor) may have adverse effects on mothers, babies, and the birthing process.*



Forty-three percent of freshman women responded that they agreed that using drugs to induce labor may have adverse effects on mothers, babies, and the birthing process. However, over 17% did not agree with this statement, and an additional 32% neither agreed nor disagreed. This means that nearly 50% of students surveyed did not necessarily believe that using drugs to stimulate contractions before the natural onset of labor could create adverse effects.

The medical label of perhaps the most commonly used drug for artificial induction, named Pitocin, reads, “Elective induction of labor is defined as the initiation of labor in a pregnant individual who has no medical indications for induction. Since the available data are inadequate to evaluate the benefits-to-risks considerations, Pitocin is not indicated for elective induction of labor.”<sup>28</sup> It then goes on to describe the various effects that augmentation could potentially present, such as maternal deaths due to hypertensive

episodes, subarachnoid hemorrhage, rupture of uterus, and fetal deaths. Additional

unpleasant or harmful effects that are possible include nausea, vomiting, the possibility of increased blood loss and afibrinogenemia, and even maternal death due to oxytocin-induced water intoxication from a slow oxytocin infusion over a 24-hour period.<sup>28</sup>

It is important for patients to understand that these effects are not common, but also that they are a possibility. Drugs such as Pitocin are not indicated for use without a specific medical reason, meaning elective induction – induction due to personal preference of patient or doctor – is not an indicated use for Pitocin.

To combat the use of Pitocin for elective induction, some hospitals have set specific restrictions and policies against this practice, especially before 39 weeks. One study found that implementation of an administration checklist that limited the use of Pitocin for elective induction was successful in reducing the duration of hospitalization, the presence of meconium, maternal fevers, and episiotomies. There was also a reduction in APGAR scores less than 7 at 5 minutes and instrumented deliveries.<sup>29</sup> Another study using 27 hospitals on the effects of reducing elective induction before 39 weeks showed a 16% decrease in neonatal intensive care admissions.<sup>30</sup> These improvements are significant and show the importance of limiting the use of labor-inducing drugs to situations that require medical intervention. A problem arises, however, when Pitocin policies exist and hospital personnel do not have any in-depth knowledge about what that policy says, which is becoming a common occurrence in many hospitals.<sup>31</sup> It is for this reason that women should have the opportunity to learn about practices such as this so that they can ask

questions such as “Do you have a Pitocin policy?” and “What guidelines do you have on the use of labor---inducing drugs?” in order to ensure best practice care for themselves and their babies.

*Question 7: For the following question please choose the answers that you believe to be true. You may choose more than one answer. Which of the following supplements do you believe are important for a favorable birth outcome?*

#	Answer	Response	%
1	Folate (Folic Acid)	74	48%
2	Iron	124	80%
3	Vitamin C	113	73%
4	Ginseng	20	13%
5	Cod Liver Oil	28	18%

The top two choices among freshman women for important supplements to support healthy birth were Iron and Vitamin C. Less than half of students answered that Folic Acid was important for favorable outcomes. The least chosen options were Ginseng and Cod Liver Oil, with 13% and 18%, respectively.

The responses to this question are in some ways concerning in regards to proper nutrition during pregnancy for optimal childbirth outcomes. Iron and Vitamin C are both important micronutrients in any healthy adult’s diet. During pregnancy, there is a slightly increased need for Vitamin C, from 75 mg before pregnancy to 85 mg recommended during pregnancy. However, there is not a common deficiency or lack of Vitamin C in a typical diet that meets maternal energy needs, so there is not necessarily a need for supplementation of Vitamin C during pregnancy, unless perhaps there is some immunosuppression disorder.

Some part of the increased need for Vitamin C is for better absorption of iron, due to the women's significantly heightened iron demand during pregnancy, from 8 mg pre- pregnancy to 27 mg during pregnancy.<sup>32</sup> Increased intake of iron is very important during this time, as iron deficiency may cause a host of unfavorable outcomes for mother and baby. Some of these include increased risk of low birth weight, preterm delivery, and perinatal mortality. Raising a woman's iron intake to this level through diet alone, however, may be very challenging. Therefore, due to its importance and effectiveness in maintaining healthy birth weights and more, it is recommended that women be supplemented with 27 grams of iron daily.<sup>32</sup> About 80% of freshman women reported that they believe that iron is an important supplement during pregnancy, which is pleasing. Perhaps additional questions would include beliefs about why this is important or how much is needed daily.

In recent years, one of the nutrients of upmost concern has become folic acid. The recommendation during pregnancy increases from 400 mcg before pregnancy to 600 mcg during. Sufficient amounts of this micronutrient have been found to reduce the risk of neural tube defects and possibly other defects as well.<sup>32</sup> A low intake of folate during pregnancy may be involve in not only neural tube defects and fetal growth retardation, but also preterm delivery and low birth weight.<sup>33</sup> A further effect of folate deficiency is an elevated level of homocysteine in maternal blood, which can increase the risk of habitual spontaneous abortion, placental abruption, preeclampsia, and other adverse maternal complications that may then affect the fetus as well.<sup>33</sup> Concerning folic acid, however, an important note is that once a woman discovers that she is pregnant, the effects of a folate deficiency may have already began, which means waiting until pregnancy to take folic acid-

containing supplements is too late.<sup>34</sup> Therefore, it is the recommendation of the U.S. Public Health Service and the CDC (and many other professional organizations) that all women of childbearing age (age 15-44) consume 400 micrograms of folic acid daily.<sup>35</sup> Because this is such an important micronutrient with serious impacts on fetal development, it is important that the majority of women are made aware of this nutritional need. Because less than half of surveys received from this project reported that folate was an important supplement during pregnancy, there seems to be a need for further dispersion of this information to all women.

Though there is some research on the effectiveness of cod liver oil on decreasing low birth weight,<sup>36</sup> some supplements may be harmful during pregnancy because of the containment of the retinol form of Vitamin A, which can cause certain birth defects if taken in excess during pregnancy.<sup>37</sup>

Though relatively few women (13%) responded that ginseng is important during pregnancy, it is a concern because this is a substance that is recommended to be approached with extreme caution during pregnancy.<sup>38</sup> Ginseng, among other herbal remedies may be recommended by some groups for various treatments during pregnancy, so it is important for women to be able to test these claims by finding research that supports them and use caution when taking recommendations for herbal remedies during pregnancy.

Question 8: For the following question please choose the answers that you believe to be true.

You may choose more than one answer. Which of the following do you believe might increase the risk of premature birth (birth before 37 weeks)?

#	Answer	Response	%
1	Low Pre-pregnancy BMI (less than 20)	102	65%
2	High-Carb Diet	30	19%
3	Smoking	135	85%
4	Psychological or social stress	129	82%
5	Being Overweight before Pregnancy	64	41%
6	Infection	110	70%
7	Mother having anemia	99	63%
8	Exercising	17	11%

The top choices for risk factors for premature birth were Infection, Psychological or social stress, and smoking. Among the least commonly chosen options were exercising and a high-carb diet.

One study revealed that around 75% of perinatal mortality was due to preterm births.<sup>39</sup>

This is an essential area for mothers to have education in as we advance in the goal of reducing the infant mortality rate in The United States.

Smoking was the number one answer to this question, with 85% of respondents selecting it as a risk factor for premature birth. This may be, in large, due to the excellent wealth of public health efforts to warn of the effects of smoking on overall health. Smoking is

associated with higher incidences of low birth weight, small for gestational age, and preterm births.<sup>40</sup>

Survey respondents were accurate in selecting stress and infection as two risk factors of preterm birth.<sup>41</sup> Another risk factor that has been well studied is the effect of low pre-pregnancy BMI, or underweight maternal status. Babies born in a singleton pregnancy to a mother who is underweight (BMI less than 20) are more likely to be born before term and have low birth weight.<sup>42</sup>

Another important risk factor for preterm birth is maternal anemia, which only 63% of respondents selected as an answer for this question. One study found that the incidence of preterm birth was double with iron deficiency anemia. Perhaps in this survey, the option on this question should have more clearly read “iron-deficiency anemia” rather than the more vague “anemia.”

There is no evidence that a High Carb diet or overweight status before pregnancy are risk factors for premature birth. The concern in survey respondents choosing these options is the potential for harmful practices in engaging in unindicated carbohydrate restricted diets or disordered eating because of these beliefs. Women should be educated on the importance of maintaining a well-balanced meals containing sufficient energy and a proportionate amount of carbohydrate, protein, and fat.<sup>32</sup> There is also no evidence that exercising is a risk factor for preterm birth, but rather may be support for is associated with a decreased risk of preterm birth.<sup>43</sup>



### *Conclusions*

There is much room for further education concerning healthy birth outcomes for college freshmen who have not yet had children. Some of the most important findings from this survey include the belief that it is not safe for a woman to eat or drink during pregnancy, which is not supported by current evidence.<sup>11,12</sup> With only 17% of respondents agreeing that this practice is safe despite conflicting research, there seems to be a need for resources given to women that will help them find current evidence to support best practices in childbirth.

Another area of concern is folic acid supplementation. Less than half of freshman women responded that this was an important supplement during pregnancy. Folate supplementation before and during pregnancy is an easy way to make major reductions in the risk of neural tube defects, among other complications of fetal development and birth.<sup>32-35</sup>

A final concern is the tendency for these respondents to select “Neither Agree nor Disagree.” This combined with the lack of strong responses (either strongly agree or strongly disagree) may reveal that even the knowledge or beliefs that these freshman women do have may not be firm or based on convincing evidence. This could make women susceptible to misinformation, bad advice, and dangerous recommendations from individuals or organizations that do not base their guidance in current evidence-based

research. For this reason, it is imperative to supplement women's existing knowledge with easy to use, available resources that will give them access to current research and evidence for them to make informed decisions and form firm beliefs about the best care for pregnancy and best practices during childbirth.

It is important that specific programs are created and implemented to first of all teach women how to find reliable health information and also how to analyze and understand that information. Such training could be added to hospital or birth center childbirth classes. However, it is important for women to gain this information even before pregnancy, so more initiatives should be made to teach high school students how to make discernments between reliable and unreliable health information. Already existing health classes could include standard objectives to have students make health decisions based on research.

Furthermore, specific information, such as the importance of folic acid supplementation for all women of child bearing age should be added into curriculum for several high school and college classes, such as health, biology, home economics, and more. Receiving this specific information in multiple classes will help students understand just how important it is.

Public health initiatives should also focus on the importance of folic acid supplementation through commercials and ads. Media is a very powerful tool for dissemination of important messages and should be used for information such as this.

*Further Research*

Further research on the knowledge that younger women have about birth will be essential in improving birth in The United States. If women are prepared and trained in how to seek out the best possible practices for their health during pregnancy and childbirth, there would be less of a struggle to wade through the waters of unending websites, blogs, and articles in order to make an informed decision.

To further this research, a greater sample of women needs to be surveyed. This survey would need to include women who are not only in college, but also women who have lower levels of education and also higher levels. It should include women from both rural areas and urban, and women with access to technology as well as limited access to technology. There should also be a wider range in age and nationality and ethnic background data should be gathered. With a larger sample, there would be the opportunity to identify which subsets of women are more at risk for misinformation and how they can be reached with effective education addressing their needs. Asking questions such as these will have significant implications for prenatal care across cultures.

Furthermore, more questions surrounding birth and pregnancy should be asked. Only a few questions were included for this project, but there are many more areas where conflicting views arise and many individuals are left helpless to come up with an answer for what care and health practices they should choose.

To extend this research to an even higher level, it would be beneficial for a similar survey to be given to health care providers, such as nurses, midwives, and obstetricians, to gain clarity on their beliefs about birth and optimal outcomes to assess the level of evidence-based practice overall and to be used as a diagnostic tool for individuals and healthcare teams. Even health care providers may sometimes hold personal opinions and beliefs that are contrary to current evidence. However, the goal in health care is to provide the best care to patients that is based in evidence based research, so such a study could be hugely helpful in improving the integrity of care across the board.

With this study combined with similar ones and moving forward in the additional research recommended in this paper, by simply identifying the level of knowledge as well as the beliefs and opinions of both patients and health care providers, we can reach the Healthy People Goal of reducing neonatal mortality and improving birth outcomes overall, moving our way to becoming an international leader in women's healthcare during pregnancy and birth.

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