

Folic Acid Awareness
New Hanover County Health Department
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INTRODUCTION

Throughout our lives we have both been interested in improving people's quality of life. Rather than focusing on specific ailments, we wanted to concentrate on people as a whole, so we looked in the direction of sociology. As sociology majors, we have applied our interests in the matter of wanting to educate women on prenatal care. Taking into consideration the importance of prenatal decisions, we realized what complications could arise due to a woman's lack of knowledge. This information led us to the New Hanover County Health Department to focus on folic acid awareness.

Folic Acid is a B vitamin, which is found in various foods but can be best obtained through a multi-vitamin. Things such as leafy green vegetables, fortified cereals, orange juice and strawberries are just some of the many foods that contain folic acid. These foods alone may not contain the entire recommended daily allowance of 400 µcg, since some of the folate can be reduced through cooking it.

Women of childbearing age should begin to take this vitamin before they even think about becoming pregnant, since 50% of all pregnancies are unplanned. Since these birth defects develop before a woman may even know she is pregnant (by the 28th day after conception), folic acid is only effective if taken before pregnancy and in the first few weeks of pregnancy. Folic acid is known to reduce approximately 70% of all neural tube birth defects (NTDs), birth defects of the brain and spinal cord. In research prepared by the University of North Carolina at Chapel Hill's Birth Defects Center, it is stated that:

NTDs are a group of birth defects known as central nervous system closure defects, which involve abnormalities in the formation of the skull, brain, spine or spinal cord... Three to four percent of all babies born have a significant abnormality in body

structure or function. Birth defects (congenital anomalies) are the leading cause of death in babies under one year of age. NTDs are the second most common type of birth defect, after congenital heart defects. NTDs are endemic - meaning they occur more frequently than many other more well known diseases (Albright et al, 1999).

There is no one single cause for neural tube defects: rather a mixture of environmental factors, genetic or hereditary factors play a part. Everyone, regardless of race, sex, age of parent or previous births, can be affected by these defects. These NTDs come without any warning and can occur even if there has never been a prior family history or other known risk factor to cause it.

This small vitamin could prevent a major life-changing birth defect. The March of Dimes Association states that:

A pregnant woman needs extra folic acid to help her to produce the additional blood cells she needs. Folic acid is crucial also to support the rapid growth of the placenta and fetus. This vitamin is needed to produce new DNA as cells multiply. Without adequate amounts of folic acid, cell division could be impaired, possibly leading to poor growth in the fetus or placenta... women who were more deficient in folic acid were more likely to have a baby who was premature and of low birthweight...and low levels of folate may be a risk factor for repeated early miscarriages (March of Dimes, 2000).

With North Carolina leading the nation in neural tube defects, it is crucial that women in this state are made aware of what folic acid is and the consequences of not taking it before they are pregnant. Being of the age we are, we have realized just how important it is to ensure that we get the correct amount of folic acid every day. Our goal for this semester was to pass on our new found knowledge to other women so that they too can be educated on this issue.

LITERATURE REVIEW

In preparing to do a background investigation of our topic, we researched studies that have already been done. Since the importance of folic acid has become such a recent phenomenon, we were able to find several current journal articles pertaining to our subject matter. While each article approached the subject in different variations, the main idea was getting the correct amount of folic acid each day.

Focus of Past Research

Werler and Louik (1999) examined three approaches to achieving the public health recommendation that all women of childbearing age receive 400 μcg per day to reduce the risk of having children born with neural tube defects. These approaches included (1) promoting the daily use of folic acid containing supplements, (2) promoting dietary intake of folate-rich foods, and (3) fortifying food with folic acid, particularly cereals.

Brouwer et al (1999) studied the effect of low-dose folic acid consumption in 144 women aged 18-40. The reason for this study is because it is believed that an elevated

plasma total homocysteine concentration is a possible risk factor for neural tube defects and cardiovascular disease. However, if one consumes a high daily intake of folic acid, this may decrease the total homocysteine concentrations.

Cuskelly, McNulty and Scott (1999) wanted to examine the effect on folate status of foods fortified with low amounts of folic acid. The study included removing folic acid enriched foods from the diets of women for 12 weeks.

Methods and Measurements

In the study presented by Werler and Louik (1999), a questionnaire was administered at birth and tertiary care centers in the greater metropolitan areas of Boston, Massachusetts and Philadelphia, Pennsylvania. It was given to 1,136 mothers of infants with major malformations who were interviewed as part of the Slone Epidemiology Unit Birth Defects Study. This is an ongoing program that confirms major congenital malformations in liveborn and stillborn infants in these areas as well as Toronto, Ontario.

The questionnaire was designed to get information on folic acid supplementation and dietary folic acid intake. Concerning the use of vitamins and medications, information regarding the product name, dose, start and stop dates, and frequency of dosing were recorded. Concerning the woman's diet, a modified version of the Willett et al (1999) food frequency questionnaire was used to determine a woman's average consumption of approximately 100 food items during the six months prior to their pregnancy. Other questions were asked regarding demographic, reproductive and medical factors, medication use, beverage intake and impressions of what causes birth defects.

First, Werler and Louik (1999) identified what supplementation was: “Supplementation with folic acid was defined as the use of any single component or combination product that contained folic acid during the periconceptional period (from 28 days before through 28 days after the last menstrual period)” (Werler and Louik, 1999). Then they divided the data into two groups; those supplementing with folic acid, and those who were not.

Second, Werler and Louik focused on (1999) women not taking supplements of folic acid. The average daily folate intake was estimated through the calculation of multiplying the folate content per serving and the average number of daily servings. Women were asked if they knew of anything they could take to reduce the risk of birth defects. If they said yes, they were asked to name what in particular it was. Women who knew the answer to be folic acid were considered to have the knowledge of the vitamin’s ability to reduce the risk of NTDs.

Third, Werler and Louik (1999) examined the fortification of foods with folic acid. “The simulations involved substituting the folate composition of enriched cereal grains with the mandated fortification level” (Werler and Louik, 1999). The average daily folic acid intake with simulated fortification was then compared to that without fortification.

In the study by Brouwer et al (1999), the women were given 250 to 500 mg of folic acid for four weeks. Women could not participate in this study if they were pregnant, smokers, had a gastrointestinal disorder, or had any of these substances in the two months preceding the study: vitamins, minerals, yeast or seaweed, malaria prophylaxis or anticonvulsants.

In the research by Cuskelly, McNulty and Scott (1999), in October of 1993, women aged 17-40 were enrolled for the study at the University of Ulster in Northern Ireland. Women could not participate if they were pregnant or planning on getting pregnant. The women were also told to withdraw from the study if they were pregnant, or thought they might be, or if they started taking folic acid on their own. If a mother in the study had a child with an NTD or had an NTD herself, she was asked to exclude herself.

Findings

In the study by Werler and Louik (1999), folic acid supplementation during the periconceptional period was found to be 29% overall. It was found that the daily intake of foods containing folate among the 807 women not taking a supplement was not enough to get them the recommended daily allowance. It was estimated that it would take about seven servings of the folate rich foods per day to achieve the 400 µcg allotment, whereas the women were receiving on average about 2.4 servings per day. Approximately 32% of the subjects studied reported that they had knowledge of how folic acid could reduce the risk of birth defects.

The results for the Brouwer et al (1999) study show that the participants folate concentrations increased in the plasma and red blood cells. In turn, the total homocysteine concentrations decreased significantly (Brouwer, et al).

The Cuskelly, McNulty and Scott (1999) study was also carried out over a 12 week period. Over this 12 week period, results showed a lowering of red blood cell folate concentrations by about 78mg per day (Cuskelly, et al). After this period, the study

showed that with an increased folate intake, one could decrease the NTD risk by as much as 50% in those women with even the lowest folate status (Cuskelly, et al). Women should take folic acid daily to make a significant beneficial effect on red blood cell folate status.

METHODS

The goals of this practicum were to identify a way to educate women on the importance of folic acid. Some health care providers assume that all women know how to prevent birth defects. However, this is often not the case and subsequently, many patients are left uneducated on birth defects.

The main part of our goal stemmed from a grant received by the New Hanover County Health Department. This March of Dimes grant provided money to the health department to educate the public on folic acid. Funding was used to provide multi-vitamins and educational material to local women. These women will be targeted through the Register of Deeds office when applying for marriage licenses. They will also be targeted through the university's wellness center, and other agencies providing pregnancy testing and/or contraceptives.

Our objective was to get the message of folic acid across to as many women as possible. We took many actions in targeting a diverse population through various forms of education. These actions included a newsletter article, the distribution of literature to the general population, health fairs, campus events, research of vitamins, preparing surveys and conducting a media review.

A local newsletter, Trinity News, is aimed towards the women of a local high school who have become teenage moms. In this newsletter, we wrote an article explaining all about folic acid and how important it is for women to take it.

We targeted a general population of people through the distribution of educational materials. We went to local shopping centers and health related stores and placed information about folic acid and the services they can receive from their local health department.

We also attended a health fair at a local high school. We set up a booth to provide information to students. We played a game with the students to test their knowledge of things pertaining to birth defects and how they could prevent them. The students were amazed at the consequences of a lack of folic acid.

Further, we attended several Women's History Month events that were sponsored by the University of North Carolina at Wilmington. We set up an educational booth. With this booth we were able to display information regarding folic acid and talk to people as they approached.

In preparation for the carrying out the main grant, we researched information on the cost of vitamins. We discovered that health departments were able to purchase vitamins at a discounted rate for large orders.

To obtain information from those women targeted through the grant, we developed a pre and post-survey. These surveys questioned their intake of a multi-vitamin and demographic information. The data from these surveys will be used at the conclusion of the grant to determine information regarding the lack of knowledge of folic acid. (See Appendix A to review the pre-survey and Appendix B for the post-survey).

A final thing that we did was conduct a media review. This was a review of the educational material that is intended to go into the informational packets that women receive through the grant. It is designed to ensure that all information is accurate and not biased to any population. The material must be clear and not offensive to anyone reading it.

RESULTS

The March of Dimes grant is not scheduled to actually be in effect until this summer. This is when the vitamins will be distributed throughout the county. Seeing as the grant will not be completed until sometime in the fall, we were unable to obtain any results.

The health department plans to use the information from the surveys to determine which populations are lacking knowledge and which populations are more susceptible to neural tube birth defects. From gaining this information, the health department will try to educate these specific populations even more.

DISCUSSION

From this practicum we realized how little we knew about folic acid and how important it is to take it. Through the various public events we attended we discovered just how many people are unaware of this matter. We never really knew how crucial it was to have your body prepared for a baby-- even we didn't think about it, and we are the prime population affected. We now take our multi-vitamins daily so we will be ready for anything unplanned that may occur.

We encountered some limitations throughout the semester that inhibited some of our plans. The lack of time in our schedules proved to be an obstacle to get everything done. However, this also helped us to learn good time management skills. A limitation that indirectly affected us was the limited funds available for the health department.

Overall, this practicum was a good experience. It allowed us to use our sociological skills and we gained a thorough understanding of folic acid. Our communication skills with the public have become more developed through the various activities that we completed.

APPENDIX A

Pre Survey

Name _____

Address _____

Phone # _____

Email Address _____
(if applicable)

Permanent Address _____

- 1. **Are you currently taking a multi-vitamin?**
 Yes No
- 2. **If yes, do you take them daily?**
 Yes No
- 3. **If no, do you plan to start taking the multi-vitamin provided for you in your bag?**
 Yes No
- 4. **Are you aware of what folic acid is?**
 Yes No
- 5. **What is one reason you would take a multi-vitamin?**

- 6. **What is your age?**
 12-15 years old
 16-19 years old
 20-25 years old
 26-30 years old
 31-35 years old
 36-40 years old
 40+ years old
- 7. **What is your race?**
 African American
 Caucasian
 Latino
 Other (please specify) _____
- 8. **What is the highest level of education you have completed?**
 less than high school
 high school diploma
 some college
 bachelor's degree
 post-graduate degree
- 9. **Are you from this area?**
 Yes No
- 10. **If so, how long have you lived here?**
 less than 1 year
 1-5 years
 6-10 years
 10+ years

APPENDIX B

Post-Survey

Name _____

Address _____

Phone # _____

Email Address _____
(if applicable)

Permanent Address _____

1. Are you still taking a multi-vitamin?

Yes No

2. If yes, are you taking one daily?

Yes No

3. If no, why not?

4. Have you purchased additional
vitamins on your own?

Yes No

5. Do you know anyone who has had
a child born with a neural tube defect?

Yes No

6. As a child, did you take vitamins?

Yes No

7. What is your income?

\$ 0-9,999

\$ 10,000-19,999

\$ 20,000-29,999

\$ 30,000-39,999

\$ 40,000-49,999

\$ 50,000 +

8. What religion do you practice?

REFERENCES

Brouwer, Ingeborg et al. 1999. "Low-dose folic acid supplementation decreases plasma homocysteine concentrations: a randomized trial." American Society for Clinical Nutrition.

Cuskelly, Geraldine J., Helene McNulty, and John M. Scott. 1999. "Fortification with low amounts of folic acid makes a significant difference in folate status in young women: implications for the prevention of neural tube defects." American Society for Clinical Nutrition.

Werler, Martha M., and Carol Louik. 1999. "Achieving a Public Health Recommendation for Preventing Neural Tube Defects with Folic Acid." American Journal of Public Health.