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Targeted Health Program Effects on Health Perceptions Among Pregnant Women: The Importance of Health Promotion During a Pandemic

Senior Project

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By

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Abstract

The research that will be conducted in congruence with the University of North Carolina at Pembroke’s Nursing Department and aims to deliver a targeted health program to improve perceptions of health and health promotion activities among the at risk pregnant population. While it is well known that the elderly, minority populations, and those with preexisting conditions, such as asthma, are among the high-risk populations, expectant mothers are another group that is considered at risk (CDC 2020). Additionally, in Robeson country data has shown that there has been a growing number of COVID-19 cases. Through surveillance of this population formulation and implementation of the education program these mothers will have a greater awareness about the positive outcomes of health promoting behaviors and will thus increase their intention to adopt these behaviors. These behaviors will not only better protect the health of pregnant mothers during the COVID-19 pandemic but also improve overall health of expectant mothers.

Targeted Health Program Effects on Health Perceptions Among Pregnant Women: The Importance of Health Promotion During a Pandemic

**SARS-CoV-2 (COVID-19)**

Coronavirus disease 2019 (COVID-19) was first recognized in China in December of 2019. This disease is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that has spread globally to become a pandemic (Rasmussen & Jamieson, 2020, p. 190). This virus is primarily transmitted from oral or nasal droplets. To elaborate, the virus enters through your nose or mouth and the outer spike protein of the virus attaches to the ACE2 receptors on the surface of our respiratory tract cells. The binding of the COVID-19 virus and our human cells allow the viral envelope to join with the membrane of our cells so the virus may release its genetic material into a previously healthy cell. Finally, the virus’s RNA instructs the host cell to translate the directions it gives into proteins that make additional virus particles (Scripps Research, n.d.). While there is significant data on the COVID-19 virus as a whole there is still data lacking in the study of this virus among pregnant women.

**Pender’s Model of Health Promotion**

Pender’s model of health promotion aims to describe the multidimensional nature of persons as they interact with their environment. One of the main things, according to Pender, that affects an individual’s willingness to partake in health promotion activities is based on the individual’s analysis of perceived benefit versus perceived barrier (Nursing Theory, 2020). In other words, the greater the perceived barrier the less likely the individual is to partake in behaviors that promote health. My project hypothesizes that these perceived barriers to health promotion activities can be reduced through a targeted education session.

**How COVID-19 Affects Pregnant Women**

The majority of the literature has found that COVID-19 is commonly self-limiting, but in populations such as pregnant women complications are more likely as well as morbidity and mortality (Carbon, Saccone, & Zullo, 2020, p.92). To elaborate, in a systemic review conducted by Gill, Juan, Poon, Rong, Zhang, and Yang (2020) two maternal deaths were reported. The first death was a 27-year-old at 33 weeks gestation that develops multiorgan failure and passed one day after giving birth to a cyanotic newborn. The second death involved a 22-year-old at 32 weeks gestation who required intubations and mechanical ventilation, her condition deteriorated resulting in death 15 days postpartum (p. 20-21).

While most studies have found that pregnant women in good health have no increased risk of contracting COVID-19 certain factors are “risk factors for a moderate to severe diseases” (Campbell, Cate, Grechukhina, Greenberg, Kohari, Lipkind, Lundsberg, Pettker, & Reddy, 2020, p. 1) In other words, Campbell et al. (2020) found that obesity and certain ethnicities, in this study those of Hispanic origin, are both risk factors for a more severe case of a COVID-19 infection (p. 2). However, the Hispanic population is not the only minority group that has been disproportionately affected by COVID-19. A Morbidity and Mortality Weekly Report (2020) found that “in 23 states with sufficient COVID-19 patient race/ethnicity data, the overall COVID-19 incidence among [American Indian/Alaskan Native] persons was 3.5 times that among white persons” (p. 1167). This number is likely even higher since the number of states used with sufficient data, in this case, 23, only make up approximately 1/3 of the Native American and Alaskan Native United States population (p. 1168).

**Primary Symptoms Found Among Pregnant Women with COVID-19**

Gill, Juan, Poon, Rong, Zhang, and Yang (2020) found that the most common signs and symptoms among pregnant women with COVID-19 were fever, cough, dyspnea, shortness of breath, fatigue, and myalgia (p. 24). In a similar study conducted by Campbell et al. (2020), they found similar symptoms but were able to divide these symptoms between severe virus infection and just mildly symptomatic patients. According to their research pregnant women with a more severe case of the virus will most likely portray muscle aches, fever, shortness of breath, nausea, chest pain, and abdominal pain, on the other hand, patients with only a mild case of the virus who are will mostly display cough, muscle aches, and sore throat (p. 7). However, a small case series conducted by Baptiste, Breslin, D’Alton, Goffman, Gyamfi-Bannerman, & Miller (2020) determined that asymptomatic patients are not uncommon when 2/7 mothers were asymptomatic, 5/7 mothers were afebrile, and 4/7 mothers were without cough thus making it harder to determine COVID-19 infection in people without common symptoms (p. 3).

When pregnant mothers in these studies were shown to be positive lab values were often gathered to see if the virus caused any notable changes. In the study conducted by Gil et al. (2020) majority (80%) of the 160 pregnant person population that they tested had normal or low leukocyte levels, 43% displayed leukocytopenia, and approximately half had an increase in C-reactive protein (p.20). Another study conducted by Beigi, Carroll, Eckert, Gyamfi-Bannerman, Hughes, Jamieson, Riler, Swamy, and Turrentine (2020) found a correlation between C-reactive protein levels and disease severity. In their words, “maternal disease severity was positively correlated with serum concentrations of C-reactive protein and alanine aminotransferase” (p. 4). Finally, Campbell et al. (2020) concluded that all pregnant women in their study who were positive for COVID-19 had an increase in C-reactive protein and D-dimer levels during delivery (p. 7).

As the SARS-CoV-19 virus appears to heavily affect the respiratory system some data has been gathered on chest scan findings in pregnant women who are positive for COVID-19. Gil et al. found almost all women had positive CT chest findings with either patchy shadowing or ground-glass opacity (p.20). This is supported by similar findings from a study in which CT scans of positive mothers showed “decreased diffuse and bilateral ground-glass opacities, patchy lung consolidation, and blurred borders” (Zhu, Wang, Fang, Peng, Zhang, Chang, Xia, & Zhou, 2020, p. 52).

**In Utero Transmission of SARS-CoV-2**

COVID-19 positive mothers passing the virus onto their unborn children is doubtful as there have been no documented neonates with intrauterine vertical transmission occurring with SARS or MERS (Lu & Shi, 2020, p. 565). In a study conducted by Zhu et al. (2020) 10 neonates born to mothers with positive COVID-19 tests in the Hubei province showed no evidence of vertical transmission via the placenta (p. 56). However, various studies research teams in China have come to contradict the majority held notion that SARS-CoV-2 being spread through vertical transmission is unlikely (Kimberlin & Stagno, 2020, p. 1788). To elaborate, Dong, Tian, He, Zhu, Wang, Liu, and Yang (2020) believe that the elevated IgM antibody levels in the newborn they studied shortly after birth indicate in utero transmission of the virus even though the infant had multiple negative RT-PCR tests via nasopharynx swabs (p. 1847). Another Chinese study that connected COVID-19 to in utero transmission-based their conclusion on the finding that “virus-specific antibodies were detected in neonatal blood sera samples” Zeng, Zhu, Fan, Tang, Deng, Zhang, & Long, 2020, p. 1849). To elaborate, Zeng et al. (2020) believe in utero transmission of SARS-CoV-2 is plausible due to the fact that of the 6 infants in their study, 5 had elevated IgG levels, which is passively transferred from the placenta to the child, and 2 infants had elevated IgM levels which are not usually transferred from mother to baby due to the structure of the macromolecule (p. 1849). Nevertheless, in this study to none of the infants displayed a positive SARS-CoV-2 RT-PCR throat swab test (p. 1849).

In terms of vertical transmission of COVID-19, there is some debate as to whether the data above is enough to prove that in utero transmission is present. Kimberlin & Stagno (2020) claim that because no infant specimen had a positive reverse transcriptase-polymerase chain reaction test result there is thus no virologic evidence for congenital infection (p. 1788). Furthermore, they state that in utero transmission based on IgM levels is a difficult way to prove congenital infections for various reasons (p.1788). First, most congenital infections are not diagnosed with the presence of IgM antibodies due to these assays being prone to both false-positives and false negatives. Additionally, the sensitivity and specificity of IgM tests are typically less reliable than the molecular diagnostic tests based on nucleic acid amplification (p. 1788).

**Primary Symptoms Found Among Infants Born to Women with COVID-19**

The majority of studies have shown that in most newborns born to mothers with COVID-19 test results of the infant will be negative if proper precautions are taken, however, some studies have found evidence that a mother being infected with the virus during her pregnancy and/or soon before birth will cause unfavorable symptoms for the baby. For example, Zhu et al. (2020) found that the primary symptom in infants born to mothers with COVID-19 was shortness of breath, furthermore, of the 10 neonates, 7 showed abnormalities in the CT scan (p.53). However, none of these infants ever tested positive for SARS-CoV-2. They concluded that COVID-19 in pregnant women has adverse effects on the neonate including respiratory distress and death as one infant in the study experienced. This is supported in another study where a few infants who were born to COVID-19 mothers experienced apnea with no apparent etiology and they too tested negative for COVID-19 (Coleman, Dankhara, Desai, Famuyide, Hankins, & Thekkeveedu, 2020, p. 13). Additionally, Rasmussen and Jamieson (2020) found that in their study some neonates born to women with COVID-19 were preterm or had low birth weight, however, further investigation is needed to determine if these outcomes were caused by COVID-19 (p. 190).

Very few reviews or studies have collected data on newborns diagnosed with COVID-19 24-48 hours after delivery. In one study conducted by Lu and Shi (2020), they found that the primary symptoms of neonates diagnosed with COVID-19 were shortness of breath, vomiting milk, cough, and fever (p. 565). However, additional research is needed to confirm these studies and find the cause of these COVID-19 infections among infants.

**Mitigating the Risk for Transmission and Infection**

Most of the actions to decreases the risk of a COVID-19 infection among the pregnant population is the same that the general population follows. This includes following the 3 W’s to slow the spread of the virus. To elaborate, you should wear a face-covering when out in public or around people not in your immediate household; you should wait 6 feet apart from people in public and maintain a social distance; and finally, you should wash your hands frequently for at least 20s with warm water and soap (NCDHHS, 2020). In terms of the pregnant population, there are guidelines specific to pregnancy and vaccination and actions to take when a mother is positive for COVID-19 and about to deliver.

**Decreasing Chance of Infection for Pregnant Negative COVID-19 Mothers**

According to Rasmussen and Jamieson (2020), no current data offers no compelling reasons to delay pregnancy, however, this is based on limited data. In the event of pregnancy, “the primary recommendation is to avoid becoming infected with SARS-CoV-2 through hygiene and social distancing measures” (Rasmussen & Jamieson, 2020, p. 190). However, certain risk factors present may call for pregnant women to take additional precautions. Pregnant women should be aware of the possible severe consequence of SARS-CoV-2 on themselves and their children, especially if they have risk factors. These risk factors include being overweight or obese, having hypertension, and/or a diagnosis of gestational diabetes as this has been found to increase the severity of COVID-19 among pregnant women (Collin, Byström, Carnahan, & Ahrne, 2020, p. 821).

**Health Promotion in Pregnant Women**

According to the Office of Disease Prevention and Health Promotion women are more likely to die in the United States due to pregnancy complications compared to other developed countries. As a result, the goal of Healthy People 2030 is to “prevent pregnancy complications and maternal deaths and improve women’s health before, during, and after pregnancy.” One of the keys to preventing complications in this population is through health promotion. According to lack of health promoting behaviors in the pregnant population may “lead to complications during pregnancy, such as bleeding and maternal infection, multiple admissions to intensive care units, low birth weight or early neonatal death”

**Behavior Change to Enhance Health Promotion Activities**

In a study conducted by Bahabadi et al. (2020), using Pender’s Health Promotion Model they found that “pregnant women’s greater awareness about the positive outcomes of health promoting behaviors increases their intention to adopt these behaviors” (p. 75). This is supported by the study conducted by Ayyala et al. (2020) who found that one major predisposing factor to behavior change among pregnant women is the motivation have a healthy baby and delivery (p. 3). To elaborate, knowing the reason for behavior change, in this case knowing that certain behavior change will improve the health of mother and baby, will increase the chance that expectant mothers will want to learn and adopt these behaviors for themselves.

**Project Design and Expected Results**

This research study was to take place at one time. Participants who chose to come to the information session would do so willingly based on their interest in the flyer that is sent out through Healthy Start's social media platforms (whether the online format on WebEx or the in-person format at Healthy Start). Participants would be asked if they are willing to take a pre-and post- questionnaire before the start of the session. The pre and postquestionnaire (See Appendix A and B) will ask questions regarding perceived barriers to health promotions activities. The pretest will be given before the education session and after the session, the post test will be given to determine if there is a change in perceived barriers to health promotion activities. These questionnaires will use the Linkert scale to determine changes in the individual’s opinion. The data collected regarding specific questions on perceived barriers and health behavior change was to use a percentage change for the whole group as aggregated data, not just the individual.

The pretest (see Appendix A) would be given prior to the education session to determine the baseline for perceived barriers to health promotion activities. After the administration of a focused education session the goal was to see a decrease in perceived barriers to health promotion activities during pregnancy through the administration of a post test (see Appendix B). These pre and post tests were to use a Linkert scale to give measurable meaning to the answers and see how much perceived barriers lessened after the study group sat through a focused education session.

**Conclusion**

The development of the COVID-19 pandemic reemphasized the importance of a healthy pregnancy for the good of the mother and baby. Not only do health promotion activities enhance overall all health of pregnant women but they also decrease the risk associated with COVID-19. Additonally, these behaviors decrease the chance of maternal and fetal complications intrapartum and postpartum. Through the focused educational program perceived benefits of changing behaviors to improve health promotion will outweigh the perceived barriers. As a result, more pregnant women will know the behaviors to take and will act on them to improve their overall health.

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**Appendix A**

Health Promotion Education Pre-Test

*Pre-Test*

**Introductory Questions:**

1. First Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Circle the range in which your age falls under.
   1. Between 18 and 22
   2. Between 23 and 27
   3. Between 28 and 34
   4. Over the age of 35.
3. County of residence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Circle your highest attained level of education.
   1. Less than a high school diploma
   2. High school diploma or GED
   3. Some of college
   4. College graduate

**Perceived Barriers:**

1. What is your opinion on this statement: “I have control over the health of me and my baby”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree
2. Do you feel you have access to information that would benefit the health of you and your baby?
   1. Strongly disagree
   2. Disagree
   3. Neither agree nor disagree
   4. Agree
   5. Strongly agree

**Health Promotion Behaviors**

1. What is your opinion on this statement: “I know about behaviors that can promote the health of me and my baby”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree
2. How often would you say you participate in behaviors (healthy eating, exercise, sleep hygiene, etc.) that promote the health of you and you baby?
   1. Never
   2. Rarely
   3. Sometimes
   4. Often
   5. Always

**Appendix B**

Health Promotion Education Post Test

*Post Test*

**Introductory Questions:**

1. First Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Perceived Barriers:**

1. After receiving the focused education program on health promotion what is your opinion on the statement “I have control over the health of me and my baby”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree
2. After receiving the focused education program on health promotion do you feel you have access to information that would benefit the health of you and your baby?
   1. Strongly disagree
   2. Disagree
   3. Neither agree nor disagree
   4. Agree
   5. Strongly agree

**Health Promotion Behaviors**

1. After receiving the focused education program on health promotion what is your opinion on the statement “I know about behaviors that can promote the health of me and my baby”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree
2. After receiving the focused education program on health promotion how often do you think you will participate in behaviors (healthy eating, exercise, sleep hygiene, etc.) that promote the health of you and you baby?
   1. Never
   2. Rarely
   3. Sometimes
   4. Often
   5. Always
3. What is your opinion on the statement “overall, this education program helped me to learn about health promotion activities”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree
4. What is your opinion on the statement “overall, this education program helped me to feel more able to participate in health promotion activities”?
   1. Strongly disagree
   2. Disagree
   3. Neither disagree nor agree
   4. Agree
   5. Strongly agree