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Teaching in Ghana: Respiratory Illnesses

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Introduction:

Within Ghana, the World Health Organization reports the average lifespan to be 66 years old with women living approximately 4 years longer than men on average. Ghana is known for health problems related to sanitation, unsafe drinking water, among other aspects. In "The Major Death Causing Disease in Ghana (A Case Study of Sekondi Takoradi Metropolis)", the author reported the second cause of death in Ghana is "other acute respiratory infection" (DarkoBonsu, 2015). The WHO reports that approximately 2 billion people are exposure to toxic smoke, with one billion of those inhaling polluted outdoor air. The organization reports respiratory disease to create major burden on worldwide health including chronic obstructive pulmonary disease (COPD), asthma, acute lower respiratory infections, tuberculosis, and lung cancer. Globally, the WHO reports 4 million people die prematurely as the result of a chronic respiratory disease, including infants and children (Bruce, Perez-Padilla, & Albalad, 2014) The Environmental Protection Agency reminds the public how air pollution can negatively affect respiratory health. This pollution can incite exacerbations especially in those with existing respiratory illnesses such as asthma and those with allergies as well as increases one's risk for developing infections (US EPA, 2015) .The organization specifically acknowledges particulate matter (PM) being associated with more significant respiratory problems and infant mortality. PM is highly recognized as an outdoor air pollutant but can become an indoor pollutant when from a wood stove, fireplaces, and other cooking or warming methods. The WHO recognizes the main sources of household air pollution in developing countries (such as Ghana) to be solid fuels from inefficient and highly polluting stoves, which lead to 4 million premature deaths in both children and adults in 2012. From these deaths, causes were linked to strokes, heart disease, and COPD all related to pollutant inhalation. The WHO emphasizes how children and women are

particularly more susceptible to these health consequences due to their increased time cooking and being with the mother (WHO, 2014).

This research supports the data there is an ongoing, but fixable problem related to indoor air pollution and respiratory illness and premature deaths. In reviewing literature, this proves especially true in poorer, developing countries. Many studies performed in African countries indicated lower incidence of lower respiratory infections in 16 African countries and 9 Sub-Saharan countries that utilized outdoor cooking or cooking in areas with improved ventilation – possible reducing respiratory disease up to 11%. Langbein, Peters, and Vance (2017), recognize the high circumstance of outdoor cooking in African countries in relation to the poorer conditions. In another research article by Langbein (2017), the author utilizes data from 41 surveys conducted in 30 developing countries from Asia, Africa and Latin America pointing to the reduction in respiratory illness in children when outdoor cooking and improved cooking methods are employed as compared to the current methods. Langbein recognizes one remedy of the cleaner cookstoves in that they can lead to fewer environmental effects and decrease occurrence of respiratory problems in users (Langbein, 2017). Through this research, researchers have found an astonishing correlation between children in the cooking area and the incidence of respiratory illnesses in Accra, Ghana and other African countries; in addition, the author recognized large disparities in this continent as only 18 percent of households cooked outdoors or with improved cook stoves (Langbein, 2017). He does recognize the difficultly in always cooking outdoors in relation to weather, and supports implementation and supplementation of newer, cleaner cookstoves in combination with outdoor cooking.

Bruce, Perez-Padilla, and Albalak (2014) research points to the high reliance on coal and wood for cooking materials leading to high air pollution and the evidence that points to

increase, then, in COPD and acute respiratory illness. Not only do these authors recognize the health dangers, but also environmental effects of the toxicity of fossil fuels (Bruce, Perez-Padilla, & Albalak, 2014). Research indicates high instances of air pollution and wood-stove cooking in developing areas such as KwaZula, Natal, South Africa within the traditional homes which frequently utilize open fires within the homes increasing the risk and likelihood of respiratory illness and further complications related (Bruce, Perez-Padilla, & Albalak, 2000).

These new ceramic coal pots, while expensive, prove to have great and widespread benefits. In research by Silk, et. al. (2012), there were reported fewer burns, less smoke exposure, and more efficient cook time from newer ceramic cook stoves. In addition, the amount of firewood needed and therefore time spent gathering resources was decreased significantly (Silk, et. al., 2012).

Assessment of Intended Audience:

As aforementioned, in Ghana, women and children within the household currently perform their cooking over wood stoves with high smoke production. Although, during each individual use of these cooking stoves does not produce a substantial amount of smoke, smoke exposure still builds up over time and can damage the lungs or respiratory system of these individuals. Their families may also be affected by smoke inhalation if they are around the women while they are cooking (such as babies on their mother's back).

Florence Nightingale theorized that unsanitary environmental conditions pose a health hazard and external influences can prevent, suppress, or contribute to disease or death in an individual (Environmental Theory). Also, Madeleine Leininger emphasized the importance of how in transcultural nursing, the goal of nursing care is to provide care congruent with cultural values, beliefs, and practices (Culture Care Diversity and Universality). Both of these theories

are valuable to our teaching in recognizing the conditions and cultural needs of this population while they cook and care for their children, the limited resources available to them is also recognized.

Outcomes and Goals:

For participants of this teaching project about respiratory illnesses related to smoke, four goals were created. Our first goal was that participants would be able to recognize the health hazards associated with the populations' current cooking situation using wood stoves. Secondly, participants would be able to verbalize the benefits of utilizing ceramic coal pots for cooking. Another goal was that participants would be able to explain a simple way to protect their family members from smoke exposure and developing respiratory illnesses. Our final goal was that participants would be able to verbalize and/or demonstrate how to use the new ceramic coal cooking pots.

Teaching in Action

In our teaching we began investigating the exposure to smoke the women or other participants noticed, as well as effects. We inquired "Do any of you notice a constant cough or have trouble breathing when performing simple tasks, such as walking? Do any of you notice that your children are having trouble breathing as well?" After this inquiry, we educated participants (through the help of a local interpreter) that these respiratory symptoms may be due to long-term smoke exposure from the wood stoves the women were using to cook with.

Following this step, education on the effects of the smoke from the wood cooking stoves was provided. This education included a listing of symptoms such as diminished immune system function (not allowing sickness to be fought off effectively) and paralyzed cilia in the lungs that no longer allow the defense mechanisms to properly work. It was explained how this decrease in

the defense line of the respiratory system allows particles from the environment to enter the respiratory tract (via inhaled smoke) without resistance, therefore leading to frequent respiratory infections (resulting from the foreign bodies and bacteria inhaled). Teaching the effects of the smoke on the bronchioles and branches of the airways into the lungs also occurred. The participants were told about how the lungs' airways become irritated and inflamed (further demonstrated in a visual comparison between healthy and smoked-exposed lungs) leading to narrowing of the airways. We explained how the amount of air able to be exchanged through inhalation and exhalation is reduced, therefore also diminishing overall lung function. This, in turn, can lead to chronic respiratory illnesses eventually developing such as pneumonia, COPD, asthma, and bronchitis.

To allow the women and other participants to recognize respiratory illness and the onset of respiratory problems; signs and symptoms such as coughing, shortness of breath, wheezing, hoarseness, and chest pain were provided. It was explained how even these simple symptoms can lead to long-term effects such as lung failure, lung cancer, and cardiovascular (or heart) disease, if not treated.

Following this education of the negative effects and symptoms of long-term smoke inhalation, information on preventions of such respiratory problems and illness was offered. Ceramic coal cooking pots were gifted to each household attending the teaching. These pots come with numerous benefits for the household cook, including the production of less smoke, lower outer temperatures (reducing the likelihood of burns), and faster burning time (allowing the women to weave more baskets for income or perform other household chores and duties). In addition to the new cooking pots, other prevention methods were introduced such as cooking outside when possible so that smoke is not trapped inside the house for a prolonged period of

time, keeping family members away from cooking pots to reduce the likelihood of smoke affecting their respiratory system, and encouraging the women to not hold children while they cooking over smoke.

To implement the teaching, pictures of healthy lungs versus pictures of lungs that have been exposed to smoke were provided to allow the participants to visualize what their lungs may look like in the future due to prolonged smoke exposure if they do not implement this new cooking method. As aforementioned, the new ceramic cooking pots were also presented and demonstrated to reinforce the benefits.

After the teaching was performed, we had a local community member demonstrate the use of the ceramic pot. Following this, we asked for questions and clarified on any topics covered as well as asked some questions of our own to evaluate the teaching provided.

Evaluation

To evaluate our teaching, in conclusion, we asked the participants a few questions, such as: 1) What are the negative effects of smoke on our lungs and our breathing? 2) If a person continues to use wood stoves throughout their entire lifetime, how could it negatively affect them in the long run? 3) What are some signs that smoke is hurting you and your body? 4) Why is it important to begin utilizing this new cooking method? 5) How can you help protect your children and family members from developing respiratory problems? We had a woman from the participant group either verbalize or demonstrate the steps of how to use this new ceramic coal cooking pot after being taught by a local woman or interpreter.

Conclusion

The prevalence of respiratory illnesses related to exposure is a rising but easily preventable occurrence. With acute respiratory illness being one of the highest causes of death in

Africa and other developing countries (Silk, et. al., 2012), yet prevention being so simple as reducing smoke exposure, action needs to be taken. The WHO emphasizes how children and women are particularly more susceptible to these health consequences due to their increased time cooking and being with the mother (WHO, 2014).

As a result of our teaching, numerous households have the ability to cook with the newer ceramic cookstoves that will lead to less cooking time, less resource depletion, but most importantly, less smoke production as compared to previous cooking stoves or pots. This intervention is expected to dramatically decrease the exacerbation of current health and respiratory problems as well as the development of illnesses such as acute respiratory infections, asthma, and resulting complications such as cardiovascular and other chronic diseases. Fewer burns, improved breathing and lung health quality, and less environmental impact is expected to result. This research and teaching can be easily replicated to reach more people, village, and countries to improve and protect the health and environment of many and reach better health outcomes in developing countries. To replicate and spread this knowledge, the gathering of newer ceramic coal pots and visiting groups of women (such as weavers and other occupations) in developing countries and utilizing an interpreter (preferably a local), to convey the benefits of the new pots and the risks of the old cook stoves. Risks include burns, respiratory illness (chronic or acute), and then further complications such as heart diseases and conditions. Demonstrating the use of the new cookstove and including the learners in the demonstration is vital in educating them on proper use. The women who then fully understand can help and educate others and spread the benefits and efficiency of these newer ceramic cookstoves. Overall, our hope is to continue to educate on future trips, prevent chronic illness from respiratory problems related to smoke exposure, development of respiratory illnesses in younger children in the household, and

create a healthier, yet more efficient way to cook food for families within developing countries such as Ghana.

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