Utilizing Short-Term Medical Missions to Create Sustainable Asthma Care in Under-served Populations

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Structured Abstract

LOCAL PROBLEM
Lack of appropriate diagnosis, education, and treatment facilities are associated with poor health outcomes and are partially responsible for the well-documented asthma outcome disparities among minorities and low socioeconomic populations. In the Copan region of Honduras, most individuals report symptoms suggestive of asthma making a presumptive diagnosis unreliable, and access to spirometry testing is very limited. Population-specific predictors of an asthma diagnosis would be beneficial in diagnosis and treatment when spirometry is unavailable. Providing sustainable asthma care to this patient population requires creative solutions and confirmed diagnoses.

PROJECT PURPOSE
The purpose of this DNP project was to develop an asthma education and action plan for sustainable asthma care based on available resources for the under-served population in rural Honduras. Secondly, a retrospective review of patient data was completed to identify self-reported symptoms and physical exam findings predictive of a positive asthma diagnosis confirmed by portable spirometry in this population.

METHODOLOGY
The Quality Implementation Framework was used to guide this DNP project. Previous experience with the study population was considered when developing a culturally appropriate evidence-based asthma education and treatment plan based on resources available in-country and structured to allow for individualization. The asthma plan was implemented in 8 villages in the Copan department of Honduras during a 2-week medical mission trip. Clinicians on the trip provided standard of care for asthma by assessing patients using a symptom and physical exam checklist. Patients meeting criteria were tested for asthma using the EasyOne Air portable spirometry device. Individuals with a positive asthma diagnosis received an asthma education and treatment plan, including a peak flow meter and instructions for when and where to seek nebulizer treatment with albuterol which was left with trained individuals in 7 villages. Upon return, an IRB approved retrospective review of reported symptoms and physical assessment data was completed to identify findings predictive of a positive asthma diagnosis confirmed by portable spirometry in this population.

RESULTS
Retrospective review of data showed that 79 people were tested for asthma utilizing portable spirometry. Of those 79, 38 qualified for post spirometry testing following inhalation of a beta agonist. Several individuals who did not qualify for post-bronchodilator testing were believed to have COPD. Of the 37 able to complete testing,
17 were confirmed with a positive diagnosis of asthma. Asthma action plans were created for each patient with a confirmed diagnosis of asthma. These action plans were individualized and tailored to the resources available to the patient. The asthma plans incorporated the utilization of peak flow meters, inhalers, steroids, allergy medications, and nebulizer devices left with each village pastor.

Physical exam findings were more predictive of a spirometry confirmed asthma diagnosis than self-reported symptoms. Data showed that physical exam findings most predictive of a positive asthma diagnosis confirmed by spirometry in the rural Honduran population were dyspnea ($p < 0.05$), pulse oximetry readings of $\leq 90\%$ saturation ($p < 0.05$), diminished breath sounds ($p < 0.1$), and cough ($p < 0.1$). There were no self-reported symptoms, including report of previous asthma diagnosis ($p < 0.369$), which met statistical significance.

**IMPLICATIONS FOR PRACTICE**
In the U.S., it is common to provide a presumptive diagnosis of asthma by relying on self-reported symptoms such as cough and shortness of breath, in addition to physical exam findings such as wheezing. If a patient in the U.S. also reports a previous asthma diagnosis, it is accepted as true. However, in the rural Honduran population, a reported previous asthma diagnosis was not a predictor of positive asthma confirmed by spirometry. This demonstrates the lack of spirometry testing, provider inaccuracy and patient misreporting in Honduras may lead to an over diagnosis of asthma. In addition to an over diagnosis of asthma, there is an increased potential for misdiagnosis due to symptom similarity between asthma and COPD. Physical exam findings may be more predictive than self-reported symptoms because asthma is frequently untreated resulting in increased severity. The living conditions in many of the rural Honduran villages contribute to asthma suggestive respiratory symptoms (i.e. cough) in most of the population. This study suggests that portable spirometry is needed to provide an accurate diagnosis of asthma in the rural villages of Copan in Honduras. Acute asthma exacerbations are common in this untreated population. Acute asthma exacerbations limit the accuracy of testing by skewing improvement results. Due to the large number of patients seen in asthma crisis, treatment may be needed before obtaining baseline spirometry. To best promote asthma action plans and health care sustainability, nebulizer devices and medication must be left with each village. There is a strong need for education on stove ventilation systems and the importance of keeping smoke outside the home. Additional data collection over a longer period of time is needed to assess patient outcomes following implementation of individualized asthma action plans.

**Keywords:** asthma, spirometry, wheezing, rural health, mission trips

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