Asthma is a chronic disorder that is a serious health issue in the United States. The respiratory disease affects millions of children and asthma exacerbation adversely impacts their quality of life, along with their caregivers. The economic impact is in the billions of dollars and asthma is the most common non-communicable disease among children. The National Asthma Education and Prevention Program established guidelines in the *Expert Panel Report 3* to help healthcare providers in their decision-making process in assessment of asthma severity and to maintain control of symptoms. This literature review assesses the effectiveness of interventions based on the guidelines. Outcomes were measured through quality of life indicators along with reduced hospital recidivism and missed school days. Interventions included school-based education programs as well as hospital-based/acute care education programs. The use of technology was focused on, especially in the way it is used to reduce disparities in care among under-served populations. Inclusion criteria for the literature review included studies with patient populations aged 5-18 with a diagnosis of asthma. All genders, races, and ethnicities were considered. The studies encountered included randomized controlled trials, qualitative descriptive design, and retrospective cohort. The search aimed to find published studies within five years of June 1, 2018, when the search was completed. Databases reviewed included CINAHL, Cochrane, MEDLINE, and OVID. Search parameters included “nurse-based asthma education” or “nurse-led asthma education” and “missed school days” or “hospital recidivism”, “nurse based asthma education” and “hospital readmission”, and “nurse-based asthma education” and “technology”. Heterogeneity of the studies did not allow for meta-analysis or pooling but a focus on the statistical significance was applied to assess the effectiveness of study data. Overall, nine studies were included in the literature review. Three directly involved school-based asthma education, four involved asthma education within acute care/hospital settings, and four included the use of technology in health education, with three specific to asthma. The literature review found that the *Expert Panel Report* guidelines did serve to create programs to help maintain control. Positive impact was found in school programs for children that included the caregiver in education. Outcomes were measured in increased compliance with maintenance medications, reduction of allergens, use of Peak Flow Metering, decreased absenteeism from school and work, as well as a reduction in hospital readmission. Hospital-based education programs had positive outcomes when they were tailored to the specific area they were in and had extended hours. Technology served to reduce disparity among disadvantaged children as long as the technology was included with a comprehensive plan that involved regular face-to-face provider evaluation. The poster will focus on the effective school-based and hospital-based education programs with a special focus on technology involved, including translation services and tele-health.

Title:
Reviewing Effectiveness of Nurse-Led Pediatric Asthma Education Programs in Preventing Hospital Recidivism and Missed-School Days

Keywords:
Children, Nurse-based asthma education and technology

References:
Abstract Summary:
The poster will provide an overview of nurse-led pediatric asthma education and its relationship with hospital recidivism and missed school days. Research was done via a literature review and the poster will highlight technology use and best-practice techniques in current practice.

Content Outline:
Introduction:
The poster will present the findings of a literature review to establish the effectiveness of nurse-led asthma education in prevention of hospital recidivism and missed school days.

Asthma is a chronic disorder that affects millions of children in the United States.

The National Asthma Education and Prevention Program Expert Panel Report created a framework for assessment and management of asthma that is used as a basis for the majority of education programs.

Background:
Asthma is a serious public health issue in the United States

- It most often occurs early in life and is the most common non-communicable disease in children
- In the U.S., 7.1 million children have asthma
- The burden of asthma is greatest in the 10-14 year old age group.

Asthma is a serious economic concern

- As of 2007, the estimated cost to U.S. society was $56 billion dollars

- In 2008, asthma caused 10.5 million missed school days and 14.2 million missed work days for caregivers.

Asthma is a chronic respiratory disease that is characterized by a restriction of airflow within the lungs, inflammation of the airway, increased mucous production, and hyper-reactivity of the bronchial passages to irritants.

- Irritants are referred to as triggers. They include changes in weather, respiratory infections, stress, physical activity, allergies, and indoor and outdoor pollutants.

- Symptoms include coughing, dyspnea, chest tightness, and/or wheezing. They are classified as mild, moderate, or severe.

Due to the burden of asthma in the U.S., the National Asthma Education and Prevention Program was created.

- This program established that minority populations are disproportionately affected by asthma.

  - Adequate control can be attained through treatment and education that involves the patient, caregivers, healthcare providers, and the school.

  - Schools are ideal asthma education locations because they allow access to large groups of children in a learning mindset.

Description:

Data was obtained from a literature review of 9 studies on pediatric asthma education.

- Three studies involved school-based asthma education

- Four studies involved asthma education in a hospital/acute care setting

- Four studies involved the use of technology in health education, with three specific to asthma.

One study highlighted that school-based education was provided most often by certified asthma educators, nursing students, community health nurses, and respiratory therapists.

  - The study concluded that school-based education programs improve quality of life and reduce exacerbations.

In another study, nurse case managers were used, resulting in positive outcomes with asthma control v. the control group.

  - Allergen reduction techniques led to a decline in household dust.
• The average missed school days were reduced v. control as well.

A third study reviewed the use of telemedicine in rural areas, due to the high morbidity for asthma patients in these areas.

• A randomized trial of 393 7-14 year olds provided school-based telehealth services to the participants and evidence-based recommendations to the PCP.

Hospital-based studies reviewed the ability to establish Emergency Department-based Asthma Education guidelines, since this is often the setting for initial diagnosis and chronic treatment of asthma patients in underserved areas.

• The study found that, despite reservations of staff, it is possible to implement a program as long as proper planning and staff input is utilized, to increase buy-in.

• A second study found correlation with socio-economic status and the rate of ED revisits, which was associated with access to controller medications and environmental triggers.

Three studies focused on the use of technology, which will be highlighted in the poster.

• A pilot study done in a pediatric acute care setting found that use of an iPad with translation software that had vocalization capability found that the technology facilitated improvement with the nursing staff and the patient/caregivers.

• Since 1990, children born have experienced computer-related technology on a near-daily basis. Interactive Data Collection (IDC) technology studies show that children prefer IDC of pen-and-paper assessments since the environment created by the IDC appeals to the child’s imagination and promotes feelings of mastery and competence through auditory and visual cues.

• A study of smartphone applications found an overwhelming benefit to the patient/RN coordinator relationship with teenage asthma patients.

• Technology increases convenience for the patient, which increases compliance with the program.

Conclusion:

Expert Panel Report-3 guidelines encourage ongoing assessment of asthma control, so multiple measures of control are needed in all aspects of a patient’s life, not just when they are in exacerbation in the PCP office or Emergency Department. Prevention through education is the best tool available to maintain control and nurse-led teaching in school settings and the use of technology can help close gaps in care among under-served populations when used in conjunction with face-to-face education and follow-up.

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**Author Summary:** Dylan McLellan has been a Registered Nurse for 10 years and earned his BSN from Hood College in May of this year (2018). As a student, he presented evidenced-based asthma education to the Frederick County Public Schools nursing staff and helped to update the new-patient education packets for the Frederick Memorial Pediatrics Department.