

Spring 4-2018

A Pediatric Respiratory Care Curriculum for Emergency Department Nurses

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DOI: <https://doi.org/10.31979/etd.xwwc-p6x5>
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ABSTRACT

As pediatric visits to community hospitals increase, the Institute of Medicine (IOM) and the Pediatric Emergency Care Network (PECARN) recommend that staff be provided improved education, protocols, and resources to improve patient outcomes (Emergency Medical Services for Children, n.d.). Acute respiratory disorders are the most commonly seen complaints in children aged 0–24 months, with an average of 2–4 visits a year. The purpose of this Doctor of Nursing Practice (DNP) project is to create a pediatric respiratory care curriculum for emergency department nurses in the Kaiser Permanente Central Valley Area (CVA) and to have it evaluated by a group of DNP students with the goal of having a sound, reusable pediatric respiratory curriculum that can be used for continuing education and orientation for nurses. The curriculum is divided into 3 modules—module 1: review of cardiovascular and respiratory systems and pediatric assessment; module 2: review of six respiratory disorders’ (croup, asthma, bronchiolitis, upper respiratory infections, pneumonia and respiratory syncytial virus) pathophysiology, assessment, treatments, and interventions with disease-specific case study reviews; and module 3: simulation. A Survey Monkey tool was used to obtain demographic data of the participants and evaluate the stated outcomes for each module. Measures of central tendency were collected and analyzed by percentages for both demographics and curriculum evaluation. All participants agreed that the curriculum met the stated outcomes; however, results of less than 80% were identified as areas for future improvement.

Luzmaria Alcalá-Van Houten
April 2018

A PEDIATRIC RESPIRATORY CARE CURRICULUM FOR
EMERGENCY DEPARTMENT NURSES

by

Luzmaria Alcala-Van Houten

A project

submitted in partial

fulfillment of the requirements for the degree of

Doctor of Nursing Practice

California State University, Northern Consortium

Doctor of Nursing Practice

April 2018

APPROVED

For the California State University, Northern Consortium
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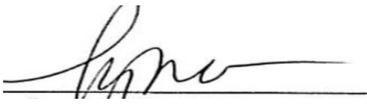


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ACKNOWLEDGMENTS

I would like to express my gratitude to all the people who have supported and encouraged me through the completion of this project. Special thanks to my project committee chair, Dr. Danette Dutra who guided me and helped keep me together, my project committee members Dr. William Redford Dr. Christian Cheung, my program advisor Dr. Nisha Nair, and my mentor Dr. Jeannie Labat-Butler. Without their support, encouragement, and guidance this project would not have been possible.

I would also like to thank my fellow DNP classmates who took the time to review my curriculum and complete the survey, providing me with valuable feedback for improvement. Most of all, I am thankful to them for their continuous support throughout this program.

I would like to give special thanks to the people in my life that have been there through my journey of growth—first, to my sons, Mathias and Lukas, who are my strength and inspiration for everything I do, to my friend and confidant Mechelle Perea-Ryan, and to Donna Schulz who taught me how to be an educator.

I would also like to dedicate this achievement to my mother, who always encouraged, supported, and most importantly let me know that nothing was unachievable.

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CHAPTER 1: INTRODUCTION

The emergency department (ED) has become the first line of care in our healthcare system for many individuals. Patients from all age groups come to the ED presenting with varying types of illnesses. The staff who work in the ED need to be prepared to address all stages of medical conditions in order to provide high quality care. As the demographics of the ED change, so does the role of the nurse, who must be able to quickly identify “clinical problems, provide safe, quality nursing care, have expertise in triage and prioritization, resuscitation and demonstrate critical thinking” (Gurney, Bush, Gillespie, Walsh, & Wilson, 2015, p.1). With changes in healthcare availability and increasing visits to the ED, “nearly 27% of all annual visits are pediatric related” (Schenk, & Edgerton, 2015, p.673). Since pediatric-specific EDs are limited within a geographic region, most children are seen in local community hospitals. These children can present with simple minor complaints to more critical conditions that need immediate advanced care.

Most nurses who work in the ED come in with a solid foundation in adult care. Although adult patients can be challenging, nurses still have a higher level of comfort while caring for this population. Since most education and protocols focus on the adult population, there are limited resources for nurses to pull from when caring for the pediatric patient. This limited knowledge and experience can lead to feelings of anxiety and lack of confidence when providing care for children.

Background

Currently the minimally required certification for nurses who work in the ED is to have either Pediatric Advanced Life Support (PALS) or Emergency Nurses Pediatric Curriculum (ENPC). PALS focuses on interventions for the child in cardiovascular compromise or cardiac arrest and provides minimal review on respiratory illnesses. ENPC, a course provided by the Emergency Nurses Association (ENA), is a two-day

class that focuses on pediatric emergencies and critical care issues. Although this is a comprehensive course it is not usually required by most hospitals. For many ED nurses, PALS or ENPC may be the only course they take that covers pediatric emergency care. For nurses who work in a community hospital that may see a large pediatric population, their pediatric education is limited which may adversely affect the care and outcome of a child.

In the pediatric population, especially the age group from 0 to 24 months, respiratory distress is one of the most common reason for visits to the ED. “Acute respiratory infections (ARIs) are the most common causes of both illness and mortality in children under five, who average three to six episodes annually regardless of where they live or what their economic situation is” (Simoes et al., 2006). Respiratory compromise in children, especially infants and toddlers, must be promptly recognized and aggressively treated since children may become fatigued or decompensate quickly, leading to cardiac arrest. This understanding that a child in respiratory distress can lead to respiratory failure and decompensation can make nurses uncomfortable and unsure of themselves. To be prepared to face these challenges, ED nurses need current and relevant education to provide them with resources to improve their critical thinking and make appropriate assessments and decisions in clinical practice.

Purpose

The purpose of this project is twofold. Initially a Central Valley Area (CVA) Kaiser Permanente ED pediatric respiratory care course curriculum will be developed. The educational curriculum will focus on respiratory care of children from the ages of birth to 2 years and will include both didactic and clinical skills for the ED nurse. The secondary aspect of the project is to have the curriculum evaluated by experienced nurses. These nurses are the participants of this project and will be asked to review and offer constructive insight of the appropriateness of the curriculum. Ultimately the goal of

this project is to have a sound, reusable pediatric respiratory curriculum that can be used for continuing education and orientation for nurses in CVA Kaiser Permanente ED.

Theory

Malcolm Knowles was a theorist who proposed how adults learn. Knowles first introduced the concept of andragogy, which he described as “the art and science of helping adults learn” (Knowles, 1980 p.43). The term *andragogy* originated from Plato’s teachings and means adult learner. Knowles believed that learning is more subjective than objective, with an emphasis on the learner’s “individual interpretation, integration, and transformation of knowledge from experience” (Carpenter-Aeby & Aeby, 2013 p. 210). The importance of experience brought in a more humanistic approach since emotions, motivation, and responsibility all contribute to learning. His theory was built on the belief that adults are self-directed and need to take responsibility for their own learning process by engaging in continuing education and being active participants in the organizational process. He emphasized that education provided to adult learners should be directed toward their needs instead of the needs of the facilitator.

Knowles’s adult learning theory is based on an instructional design model that emphasizes three main concepts: assumptions of andragogy, learning characteristics of adults, and conditions for learning or the environment. These three concepts are further clarified by characteristics that should be present for adults to successfully learn. In assumptions of andragogy, Knowles identified four key principles:

1. Adults need to know why they need to learn something.
2. Adults need to learn experientially.
3. Adults approach learning as problem-solving.
4. Adults learn best when the topic is of immediate value.

In learning characteristics, there are five key principles:

1. Self-concept: Increasing self-directedness of one’s needs.

2. Experience: Utilizing past experiences as a foundational guide for future learning.
3. Readiness to learn: Being open and willing to pursue new learning.
4. Orientation to learning: Using problem-centered learning that is more goal-directed by the adult as to what he or she needs to learn.
5. Motivation to learn: Having internal motivation to learn as the person matures, such as having the need for self-esteem, curiosity, a desire to achieve, and satisfaction of accomplishment (Knowles, 1980; Courtland.edu).

The third concept encompasses the conditions for learning or the environment and the role of the learner. Knowles believed that the educational environment for adults should be conducive to learning. Since most learning takes place through experience, he felt that education should be problem centered and not content oriented. Adults are more interested in learning something that has meaning and application to their lives. They recognize their learning deficits and want to make their education relevant to their personal or professional growth. This ability to relate to the information motivates them to learn.

Knowles also taught that facilitators should alter the way they provide the education. Instead of the classic lecturing, more engagement and involvement incorporating student-centered learning should be used. Knowles (1980, p. 43) coined the phrase of “re-diagnosing the learners needs.” An example of re-diagnosing needs would be using simulation where an initial assessment is done prior to the educational scenario and then again during the debriefing. This principle allows more for individual needs than collective needs.

Theoretical Application to Practice

For a pediatric patient, the early identification of symptoms is most important for preventing negative outcomes. The ED nurse who has limited experience in pediatric assessment and the disease process could easily miss a period of early intervention. This identification of need for improved recognition could be used to guide the learning process. Knowles stressed that education should reflect the environment and needs of the learner and that experiences and recognition of needs is a strong influencer of why adult learners seek further education. Knowles felt that if the learner and the facilitator chose the delivery of education, there would more likely be engagement and commitment to learning. A way to apply these principles of theory to practice would be to use pediatric case study reviews.

Selected case studies would be presented to a group of ED nurses providing only the initial presentation of the patient. The nurses would be requested to analyze the information and use their experience and knowledge to identify appropriate interventions and treatments based on symptoms and history. The ability to correctly identify symptoms assists with earlier recognition of changes and implementation of appropriate interventions for better outcomes. The process of having a group of nurses review and analyze the scenario would follow Knowles's adult learning principles of problem-centered learning, application of experience, self-directedness of readiness to learn and understand, and motivation to learn. The group members would be encouraged to engage in discussion processing through the scenario to help reinforce the learning principles by building their knowledge of acute pediatric care. At the end of the review, the group would be provided with the actual diagnosis and outcome of the patient to allow for comparison and further growth.

An example of this application for learning is as follows:

- Chief complaint: A 11-month-old male brought into the ED by parents with complaints of increased drooling for the last 5 hours. No significant medical history.
- Sign/Symptoms: Parents deny any recent illness or fever; just state that the child does not want to eat and has had sporadic coughing fits with some drooling.
- Assessment: An active, alert child with stable vital signs, O2 saturations of 97%, visible mild drooling and mild wheezing upon auscultation.

The triage nurse makes the child a level 4 due to the child's history and appearance. Since the ED is very busy and the child is triaged at a level of 4, it is approximately 3 hours before he is seen. When the child is finally seen by the provider, there is increased drooling and increased wheezing with stable vital signs. A chest x-ray ordered for foreign body aspiration shows a coin in the child's throat. The child is immediately taken to surgery to remove the foreign body.

In this scenario, although the child did recover, there could have been a negative outcome. If the swelling from the foreign object in his throat increased and closed off the airway, intubating this child would have been difficult and hypoxia would have occurred. A nurse with more experience and a stronger educational background might have been able to recognize the symptoms of increase drooling and sporadic coughing as an indication of possible airway compromise.

Summary

Educating ED nurses is a very complex process. Nurses have many demands put on them due to the variety and unpredictability of patients that present to the ED. Since lack of knowledge can affect the outcomes of a patient, it is imperative that education is available and centers around staff members' needs. The use of group learning through

real life case study reviews provides the staff members a better understanding of the consequences of their interactions in relation to recognized symptoms. The application of problem-centered learning reflects Knowles's primary principle of having the learner, not the facilitators, direct his or her needs. When this is accomplished, there is a stronger and more effective process for improving practice.

CHAPTER 2: REVIEW OF LITERATURE

The purpose of this project is to develop a pediatric respiratory care course curriculum that will focus on respiratory care of children from the ages of birth to 2 years. The curriculum will focus on the six most commonly seen respiratory conditions in the ED. The materials will be provided to ED nurses to increase their knowledge, critical thinking, and ability to implement appropriate interventions to prevent cardiopulmonary compromise. The curriculum will consist of online modules and case studies/simulation review. This project can be used for continuing education and orientation for nurses in CVA Kaiser Permanente ED.

Pediatric Emergency Care Network

Over the last few years several organizations have identified the limited training and education required of staff who care for pediatric patients in the ED. As increasing pediatric visits occur, there is a recognized need for a minimum level of competency and resources to care for critically ill children. In response to this, several agencies came together to identify guidelines for care of children who present to the ED. These agencies consisted of the American Academy of Pediatrics, the Committee on Pediatric Emergency Medicine, the American College of Emergency Physicians, and the ENA. Two primary organizations developed were the Pediatric Emergency Care Applied Research Network (PECARN) and the National Pediatric Readiness Project (PRP). PRCARN is a “research collaboration of pediatric EDs across the United States, focusing on the care of acutely ill and injured children” (Tzimenatos, Kim, & Kuppermann, 2015, p.70). The priorities of the organization are to perform research to identify best practices for care of the pediatric population in the ED. PRP is a “multi-phase quality improvement initiative to ensure that all U.S. emergency departments (ED) have the essential

guidelines and resources in place to provide effective emergency care to children” (Emergency Medical Services for Children, n.d.).

In agreement with these organizations, ENA has identified a need for a more specific and “comprehensive individualized orientation and ongoing programs to ensure that staff is competent in providing appropriate care” (Gurney et al., 2015, p. 2). A lack of standard practices, competencies, or educational guidelines promotes a culture of nurses practicing according to experience versus evidence-based practice. This can create inconsistencies in patient care. Hence, the organizations’ identification of the need to provide education built on evidence-based practice and protocols.

To respond to the need for advanced pediatric education, the ENA offers the ENPC and the certified pediatric emergency nurse credential course. Although both are comprehensive in nature, these courses are not mandated by most ED facilities but rather PALS has been adopted as the standard of practice. For nurses to provide improved care to the pediatric population, there must be courses that can be offered by healthcare facilities.

Literature Review

A comprehensive review of the literature was completed with a focus on the following topics:

- Pediatric visits to the ED
- Educational needs of nurses and the process of delivery
- Pediatric education and competencies provided to ED nurses
- Pediatric curricula or programs

Since the focus of this project is on the six most commonly seen pediatric respiratory disorders in the ED, a review of this subject matter was completed. However, no research articles were found only articles addressing clinical practice. Thus, no research articles were included.

Search terms used were *ED utilization, educational needs for nurses, training, competencies and advanced preparation, pediatric education, and pediatric respiratory disorders*. The decision was made to incorporate studies that demonstrated increased usage of the ED, those that identified educational needs and their implementation, and educational classes and requirements provided to ED nurses. Of interest to note, very few studies were found on pediatric education provided to ED nurses.

Emergency Room Visits Made by Children

Goto, Hasegawa, Faridi, Sullivan, and Camargo (2017) investigated the number of visits made by children to EDs. The researchers identified an increasing number of pediatric visits to EDs at facilities that do not have appropriate resources or training to properly take care of children. They felt that identifying the number of visits, as well as the reasons, might help attain resources for facilities. They used a retrospective cohort study, reviewing 2010–2011 data from the Healthcare Cost and Utilization Project state ED databases (SEDD) and state inpatient database (SID) from six U.S. states (California, Florida, Iowa, Nebraska, New York, and Utah; Goto, Hasegawa, Faridi, Sullivan, & Camargo, 2017, p. 1043). The SEDD and SID provide information on visits made to the EDs in the six geographical areas. The researchers focused on identifying the number and frequency of visits made by children.

Through the use of descriptive statistics, Goto et al. (2017) further examine the demographics of the children visiting the ED. Combined and separate analyses were done for all six states to further differentiate the visits and the demographics. In their review, Goto et al. identified at least one in seven children visit the ED at least once a year with

25% visiting two to three times a year and 5% visiting greater than four times. This review of the data supports other studies that have identified that EDs are playing a primary role in healthcare. The researchers also found that there were increased visits from those with lower socioeconomic status and minorities. Two primary limitations to this study was the use of a non-randomized sample and the disproportionate results obtained from three of the six states: California, New York, and Florida minimizing the generalizability

The importance of this study is that it supports the need for further preparation and education for facilities and staff when it comes to taking care of children. This study, though not well controlled, does demonstrate that there is an increasing number of children visiting the ED for various conditions. However, hospitals are not preparing their staff to adequately provide pediatric care in accordance with the IOM's recommendation.

A study by Samuels-Kalow, Bryan, and Shaw (2016) that also looked at the increased utilization of the ED by pediatric patients was a retrospective chart review at a tertiary care children's hospital. The study was conducted over 3 years from 2012–2014. The goal of the project was to identify a process by which patients with high utilization for low-acuity illnesses could be flagged for intervention. Criteria for inclusion were patients that visited the ED a minimum of four times a year over a 3-year period and were under the age of 21. The data collected the first year identified patients who were frequent users of the ED. "Second year was the index year and third was used for outcome measurements, during which frequency of high-frequency, low-acuity utilized was identified" (Samuels-Kalow et al., 2016, p.257). Low-acuity was identified as having an Emergency Severity Index of 4 or 5. "The data was randomly split into two cohorts, derivation set and validation set, with 50% of patients in each group". (Samuels-Kalow et al., 2016, p. 257). Of all the visits to the ED, 590 pediatric patients were included in the study. The top chief complaints identified were respiratory distress, fever, rash, vomiting,

and other. Limitations to the study are that data was drawn from a tertiary pediatric center, limiting generalizability to other facilities that care for children. There was also the issue with children less than 2 having three years' worth of visits to the ED.

Although this study specifically looked at the process of flagging charts of individuals who use the ED frequently, the data review demonstrates that there is a high utilization of the ED for respiratory complaints. This information provides support for the need for a respiratory curriculum for ED nurses.

Competency of Emergency Department Nurses

McCarthy, Cornally, O'Mahoney, White, and Weathers (2013) used a quantitative descriptive design to investigate the types of procedures performed in the ED and the corresponding competencies. A convenience nonrandom sample of 214 nurses in 11 hospitals were recruited by facilitators stationed in all the EDs. The respondents were primarily females 21–51 years of age who had been registered nurses for 1–21 years. The educational backgrounds ranged from an entry level degree to advance practice nurses. The data was collected using a developed questionnaire that examined 119 nursing procedures and competency levels ranging from basic nursing skills to more complex assessments of patients. Several of the questions focused on pediatric care and the nurses' comfort level in caring for this population of patients. "Descriptive statistics were used to describe the sample" and "Pearson's Moment Correlation Coefficient was used to depict the relationship between competency and frequency of practice" in eight categories (McCarthy et al., 2012, p. 52).

The results identified a wide range of procedures and protocols practiced by ED nurses who may not have received the appropriate training or education to demonstrate competency. It was also recommended that collaboration needs to occur between clinicians and educators to provide appropriate education. One limitation to this study may be the length of the questionnaire, which consists of 119 questions related to nursing

procedures. The time required to complete the survey could cause nurses to answer quickly rather than factually. A strength of the study is the identification of nursing practices that are not reflective of preparation or possible scope of practice. This identification of the lack of appropriate education nurses have in relation to the expected level of practice and competencies reinforces the need for a strong educational program in the ED.

Educational Needs for Nurses

Belal, Gaheen, and Mohamed (2015) conducted a study at the Tanta University in Egypt that looks at the educational needs of obstetrical and gynecological nurses in El-Gjarbia. The descriptive design included a sample size of 151 nurses ranging in the ages from 30 to 45 with various nursing backgrounds and experience ranging from 10 to 20 years. The sample population was recruited from two randomly selected hospitals, representing both agricultural and industrial areas. The researchers developed a tool that was validated by faculty at the neighboring nursing schools. The tool included a variety of questions in four distinct categories related to obstetrical/gynecological nursing to assess the educational needs. The data was analyzed using descriptive measures and ANOVA for statistical correlation that had a P-value < 0.05 (Belal et al., 2015, p 8). The results revealed a strong correlation between age, years of experience, and the level of education needed and identified that most nurses had limited training in obstetrics and gynecology (Belal et al., 2015). A limitation to the study may be that the survey addressed a wide range of questions instead of focusing on more specific topics. A strength of the study is the identification of the need for clinical practice education versus theoretical education received in nursing school or by computerized modules. A second strength of the study is the researchers' inability to find other studies that looked at the specific and focused educational needs of the nurses in this unit. Since this Doctor of Nursing (DNP) project focuses on developing an educational curriculum for ED nurses,

the general lack of comparison studies available demonstrates the need for further research.

Valdez (2009, p. 337) used a mixed methodology that combined a qualitative then quantitative study design using a three-round Delphi method. The focus of her study was to identify and predict the current and future healthcare trends that could affect the ED. The sample included 50 emergency nurses from 26 states who had a minimum of 5 years ED experience and had worked in an advanced role or had been involved in some type of emergency nursing curriculum. The majority of the participants had 10 or more years of nursing experience, advanced degrees, and specialty certifications in their areas of practice. The study instrument used by Valdez was a modified Delphi survey that was distributed via Survey Monkey. After each phase, analysis was completed and the information was used to make a quantitative survey form. Letters were sent to the participants summarizing the previous data and providing the information for the next phase until all three phases were completed (Valdez, 2009).

The results of the study reinforce the need for development of educational modules to provide nurses with improved critical thinking skills for all levels of patient care. One strength of the study is the wide geographical area covered, since participants were from 26 states. Even though the sample was small, it identified similar issues in all EDs'. A limitation is that the study participants were not frontline nurses, consequently the perceived needs may not be the same as those of floor nurses. This study is beneficial in that it focused on healthcare trends that would require planned education for nurses. Although this study was published in 2009, many of the topics identified still need to be addressed and are affecting nursing care today.

Implementing an Educational Process

Two studies that looked at implementing an educational process for improving nurses' assessment in identifying potential clinical deterioration in the pediatric

population were from Famolare and Romano (2013) and Horeczko, Enriquez, McGrath, Gausche-Hill, and Lewis (2013). The study by Famolare and Romano looked at improving pediatric patient outcomes through the implementation of the Pediatric Assessment Recognition and Stabilization (PEARS) class developed by the American Heart Association (AHA). The AHA developed this class to provide nurses more in-depth training on a systematic assessment for earlier intervention for pediatric patients experiencing respiratory distress. The goal is to help prevent cardiac arrest. This study was conducted at Children's Hospital in Boston after identifying a deficit in nursing assessment and knowledge in recognizing a deteriorating pediatric patient. The two-part study took place over several years where an initial pilot study was conducted with the surgical unit and then a larger study with other departments in the hospital.

The initial sample size for the pilot study was 200, and the sample size for the larger study was approximately 700 nurses (Famolare and Romano 2013). The study design was a pre- and post-quasi experimental design where nurses were given a survey that included eight questions related to demographics and questions that looked at pediatric nursing experience and their self-reported comfort level in identifying emergencies. Once the nurses were provided with the PEARS class, the same questions were asked on a post-survey. The nurses were also given a course evaluation provided by AHA that had them rate the program content, its relevance to their work environment, and the increase of their knowledge level. All surveys except the AHA survey were voluntary. On the AHA survey, 98% of the nurses reported that the class helped enhance their practice. Positive outcomes after implementation of the course was an earlier recognition of the deteriorating pediatric patient and implementing rapid responses to decrease cardiac arrests on the units. A limitation of this study was the timeliness of returned surveys as there was not a controlled plan to collect them. There were also only 20% of the surveys collected. Another limitation was that the class was only offered to

noncritical care nurses, thereby limiting data as to how it could improve outcomes in critical settings. Unexpected outcomes were the increase in rapid response calls that were recognized as helping to prevent potential cardiopulmonary compromise. The significance of this study is that there were improved outcomes for patients due to improved knowledge and critical assessment skills preventing cardiac compromise.

Horeczko et al. (2013) used a prospective observational study to identify the effectiveness of the Pediatric Assessment Triangle (PAT) on patients presenting to the ED. The PAT is a quick assessment tool that examines three primary areas: appearance of the child, work of breathing, and circulation to skin. Prior to implementation, all triage nurses were trained to use the PAT by attending a comprehensive multimedia lecture with a follow-up exam to test for competency. The sample studied ($N = 528$) consisted of pediatric patients presenting to the ED with the “exclusion criteria patients over the age of 14, developmentally delayed, [or who] had congenital abnormality or other conditions” (Horeczko et al., 2013, p. 183). Since the PAT is based on normal development, this criterion had to be included.

The study protocol consisted of nurses write their assessments on a blank card using the PAT on children presenting to the ED. These cards were collected in a secure box and later reviewed. Blind chart reviews were completed on all unstable patients and a subset of stable patients by two emergency physicians and a pediatric nurse practitioner using the PAT to identify the assessment of the child. “Providers chart-based PAT served as the criterion standard to compare the nurses initial PAT. Sensitivity, specificity, and positive and negative likelihood ratios were calculated for stability and for category of pathophysiology. Inter-rater reliability and P values were also calculated for” (Horeczko et al., 2013, p. 184). The results of this study demonstrate that the PAT is a reliable tool to assess pediatric patients in the ED. It is able to help predict unstable children by symptom presentation only. One limitation to this study was the small sample size of

pediatric patients who presented in respiratory failure due to the rarity of occurrence. This prevented them from validating the use of the PAT on this population. (Horeczko et al., 2013). The significance of this study is that it demonstrates that the use of a quick assessment tool can improve nurses' assessment skills in identifying more critical pediatric patients.

Summary

An emerging body of literature demonstrates the need for pediatric education for ED nurses. To best care for the pediatric population, especially those with respiratory disorders, an emphasis must be placed on developing courses and training in accordance with the recommendations from the IOM, PECARN, and PRP that educational curricula and protocols focusing on preparing non-pediatric facilities be implemented for all staff. The development and implementation of this pediatric respiratory care curriculum would help to address the need for advanced education for Ed nurses.

CHAPTER 3: METHODOLOGY

This project utilized a two-step process. The first part of the project was to develop an enhanced pediatric respiratory care course curriculum for nurses in the CVA Kaiser Permanente ED. The second part was to have the curriculum evaluated for content and relevance to practice. In this chapter, the design of the study, the instrument used, the sample selection, and the method of data collection is discussed.

Setting

The setting of this project was an online format. The online survey served as the format for the participants to evaluate the developed pediatric respiratory curriculum.

Project Design

The design of this project was a quality improvement proposal. The essential aspect of the project was the evaluation of a pediatric respiratory care curriculum. The evaluators were composed of a group of Northern California Consortium DNP students. The evaluation was completed via a Survey Monkey questionnaire that was divided into two sections. The first section focused on questions relating to the demographics of the participants. The second section asked questions geared toward the applicability of the content to practice and its reflection of the stated outcomes. Measures of central tendency were collected, analyzed, and represented by percentages for both demographics and curriculum evaluation.

First Step: Development of the Curriculum

The first step was the development of the curriculum. An informal needs assessment of the nurses in the ED led to the identification of a deficit in knowledge regarding care of the pediatric patient 0–24 months in respiratory distress. The curriculum focused on the six most common respiratory disorders seen in pediatric

patients as well as expected interventions and treatments. The materials for the curriculum were referenced from verified sources:

- “The Child with Respiratory Function” by Conlon (2015).
- “Acute Respiratory Distress in Children: Emergency Evaluation and Initial Stabilization” by Weiner, Fleisher, and Wiley (2016).
- *Pediatric Fundamental Critical Care Support* by Madden (2013).

The curriculum was divided into three modules. Module 1 provided a general review of the pediatric respiratory and cardiovascular system in children from 0–24 months and an introduction to the PAT tool used for quick assessments. Module 2 focused on the six most commonly seen respiratory disorders and assessment, treatments, medications, interventions, and individual case studies reflective of each disorder.

Module 3 utilized four simulation scenarios to apply knowledge to practice, reinforcing the learning process.

The detailed modules are presented in Appendix A. Below is a brief outline of each module.

Module 1:

- Respiratory distress versus respiratory failure
- Anatomy and physiology
- Effects on the cardiovascular system
- General assessment
- Pediatric Assessment Triangle (PAT)
- Abnormal respiratory systems

Module 2:

- Croup (laryngotracheobronchitis)

- Asthma
- Bronchiolitis
- Upper respiratory infection (URI)
- Pneumonia
- Respiratory syncytial virus (RSV)
- Case study review of each disease process

Module 3:

Four respiratory simulation case studies were developed to incorporate the learned materials from modules 1 and 2. The purpose of the simulation was to evaluate the nurses' ability to integrate assessment, knowledge and ability to identify the correct interventions and treatments after completing the modules.

Second Step: Evaluation the Curriculum

Once the curriculum was developed, a pilot project was implemented to have the curriculum evaluated. The questions evaluating the curriculum were individualized for each disease process. The items within the survey were designed to evaluate the material's reflection of the stated outcomes.

Participants

Purposeful sampling was utilized to recruit participants. A convenience sample of 21 students from the DNP cohort 2018 was used. The DNP students are advanced practice nurses with varied experience within the profession of nursing. In addition, all the potential participants had recently completed a curriculum development course and were deemed proficient with the requirements of curriculum development.

Recruitment

Recruitment for this project was done using a direct email sent to the 21 DNP students of cohort 2018 by the administrative assistant at California State University (CSU), Fresno State school of nursing via the university email system.

Data Collection

The survey data was collected over a period of 1 month from February 8, 2018, through March 7, 2018. The initial email was sent to a cohort of 21 potential participants on February 8, 2018, via their school email system. Included in the email was an introductory letter (Appendix B) with a brief explanation of the project, its purpose, directions on how to complete the survey, a consent disclosure, and a link to Survey Monkey (Appendix C). Also included in the email was the pediatric respiratory care curriculum, which consists of three modules and references. No deadline date was given for the surveys to be returned. A follow-up reminder email was sent out 1 week after the initial recruitment attempt. A final email request for participation in the survey was sent out 4 weeks after the first email. The review of the pediatric respiratory curriculum was designed to take each participant approximately 30 minutes, and the evaluation tool accessed via Survey Monkey was expected to take approximately 15 minutes to complete.

Tool

A two-part survey specifically designed to evaluate the pediatric respiratory curriculum (Appendix A) was author created and specific to the pediatric respiratory care curriculum for ED nurses. It included items targeting both demographic and descriptive data, plus items that focused on the evaluation of the curriculum. The evaluation survey used a 4-point Likert scale of strongly agree, agree, disagree, or strongly disagree for each question. The survey was self-developed; thus, no validity or reliability testing has been completed.

The survey requested data regarding the participants that included age, gender, credentials, years of education, areas of practice, and experience taking care of pediatric patients. The curriculum aspect of the survey asked items specific to whether the content met the stated outcomes for each topic discussed in the curriculum modules. The content included questions on the following:

- Cardiovascular content meeting the stated outcome
- Respiratory content meeting the stated outcome
- Pathophysiology, assessment and intervention, and treatment of six respiratory disorders (croup, asthma, bronchiolitis, URI, pneumonia, and RSV) meeting the stated outcomes
- Case studies for each respiratory disorder providing effective learning
- Simulation scenarios providing effective learning
- Content meeting the stated outcomes
- Disease process chosen reflective of commonly seen diseases
- Program reflecting the educational needs of ED nurses
- Learning activities appropriate
- Generalizability of curriculum

Ethical Considerations

To maintain confidentiality and anonymity, the survey was completed using Survey Monkey. The participants were reminded that engaging in the survey was purely voluntary, and there would be no adverse effects if they chose not to respond. Prior to emailing the curriculum and survey link, the study was approved by the Institutional Review Board (IRB) at CSU, Fresno. Since this project was an evaluation of the curriculum by the DNP cohort only, no other IRB approval or permissions were needed. Participation in this project was associated with very minimal or no potential psychological, social, physical, or legal risks since no patient care was involved.

Reviewing the curriculum may have been time consuming, which could have been inconvenient to the participants. Even though the survey was anonymously submitted, the DNP cohort may have been concerned about offending this investigator when providing feedback. Participants were not compensated for participating in the survey.

Potential Benefits

Once implemented, the completed and evaluated curriculum will address the recommendations of the PECARN, National PRP, and ENA that there be ongoing pediatric training or education for staff in non-pediatric EDs'. Since respiratory distress in the pediatric patient 0–24 months can be a precursor of cardiopulmonary compromise, early intervention is necessary to prevent a negative outcome. The materials covered in the course will help ED nurses be more proficient in providing care for the pediatric patient through improved knowledge, assessment, and understanding of appropriate and timely interventions.

Participants of this project had the opportunity to review, evaluate, and guide curriculum development. This process may have helped them apply learned knowledge in the curriculum course. The participants may also have gained new knowledge concerning pediatric respiratory disorders, assessment, treatments, and interventions that could be applied to their practice.

Summary

This project was the evaluation of the development of a pediatric respiratory curriculum for ED nurses using a convenience sample of a cohort of DNP students. The curriculum reviewed pediatric cardiovascular and respiratory assessment, the six most commonly seen respiratory disorders, and the assessment, treatments, interventions, and applicability of individual case studies and simulations. The data was collected using a Survey Monkey tool that gathered demographic data of the participants and evaluated the

stated outcomes for each developed module. Measures of central tendency will be collected, analyzed, and represented by percentages for both demographics and curriculum evaluation. Participants were reminded that their participation in this evaluation was voluntary and their anonymity was protected through the use of the Survey Monkey link. The ultimate goal of this project is the implementation of a sound and relevant pediatric respiratory educational curriculum for ED nurses.

CHAPTER 4: RESULTS

This quality improvement project consisted of two steps. The first was the development of the pediatric respiratory curriculum for ED nurses at two Kaiser Permanente facilities. The goal for the curriculum was to increase the knowledge, critical thinking skills, and comfort level of nurses taking care of children who are in respiratory distress. A brief description of the curriculum is provided in Chapter 3: Methodology; the complete curriculum is attached in Appendix A.

The second step was to implement a pilot evaluation of the curriculum. The evaluation sought feedback from a group of advanced practice students in the DNP 2018 cohort who had recently completed a curriculum class. In this chapter, the survey results from the evaluation of the curriculum will be discussed in detail.

Overview

To evaluate the pediatric respiratory curriculum, a survey was created and emailed with a Survey Monkey link to the DNP students. The data was collected over a period of 1 month. Eight of 21 students responded, resulting in a response rate of 38%. Of the eight that responded, one question in the demographic area and three questions in the curriculum section were left unanswered.

Demographics

The survey began with questions related to demographic information, such as background, experience, number of years nursing, credentials, certifications, areas of specialty, and experience taking care of pediatric patients.

DNP Cohort

The DNP cohort ($N = 8$) consisted of a mix of advanced practice nurses from various backgrounds. All participants (100%) were female with age distribution of 20–40, 37.5%; 41–60, 50%; and 61 or greater, 12.5%. The years of experience working as a nurse fell into two categories: 6–10 years, 12.5% and more than 10 years, 87.5%, as shown in Table 1. One of the participants skipped question 5, specialty credential, with only seven responding.

Table 1. *Demographic Information*

DNP Group ($n = 8$)	Frequency	Percentage
Q1. What is your gender?		
Female	8	100.0%
Male	0	0.00%
Q2. What is your age?		
20–30	1	12.50%
31–40	2	25.00%
41–50	1	12.50%
51–60	3	37.50%
61 +	1	12.50%
Q3. Total number of years as a nurse?		
1–5 years	0	0.00%
6–10 years	1	12.50%
More than 10 years	7	87.50%
Q4. What is your highest level of education?		
MS/MSN	7	87.50%
Doctoral degree (PhD, DNP, EdD)	1	12.50%
Other (please specify)		

Q5. Please indicate your specialty credential?

CNS	0	0.00%
NP	3	42.86%
CNL	0	0.00%
PA	0	0.00%
Other (please specify) **	4	51.14%

**NCSN, Educator & RNC (original response data with no further information available)

Q6. Please indicate your specialty certification?

PALS	2	25.00%
ENPC	0	0.00%
CPN	0	0.00%
CCRN (PEDIATRICS)	0	0.00%
CPEN	0	0.00%
Other (please specify)**	6	75.00%

**AWH, NCSN, OB RNC, FNP-C, AGPCNP-BC (original response data with no further information available)

Practice

Questions were asked focusing on past and current practice to identify participants with pediatric experience. As illustrated in Table 2, 50% had practiced in an acute setting 10 year or less and 50% more than 10 years. In identifying specific practice settings, 25% had worked in the intensive care unit, 12.5% in the ED, 12.5% in a pediatric department, 12.5% in a school of nursing, and 37% responded other. Additionally, 87.5% had experience taking care of pediatric patients and 12.5% did not. Participants were asked about the percentage of time they spend taking care of pediatric patients; two reported 90–100%, one reported 70–89%, one reported 50–69%, one reported 30–40%, and three

responded less than 10% of their time was spent caring for pediatric patients. Regarding current practice, none of the participants were working in a hospital setting, 12.5% were working in a community health setting, 12.5% in a school health setting, 25% in an ambulatory setting, 25% in an academic setting, and 25% responded other.

Table 2. *Practice Setting*

DNP Group (<i>n</i> = 8)	Frequency	Percentage
Q7. Total nursing years in acute care setting?		
1–5 years	3	37.50%
6–10 years	1	12.50%
More than 10 years	4	50.00%
Q8. Indicates area of current or past work?		
Medical-Surgical Unit/Telemetry	0	0.00%
Intensive Care Unit	2	25.00%
Emergency Department	1	12.50%
Pediatric Department	1	12.50%
School	1	12.50%
Academia	0	0.00%
Other (please specify) **		
** Clinics- mother/baby, skilled nursing & school of nursing, clinic		
Q9. Indicate if any part of your nursing care currently or in the past included taking care of the pediatric population, however infrequent?		
Yes	7	87.50%
No	1	12.50%
Q10. If yes, what is/was the average percentage of time spent in caring for pediatric patients either currently or in the past?		
90 – 100%	2	25.00%

70 – 89%	1	12.50%
50 – 69%	1	12.50%
30 – 49%	1	12.50%
10 – 29%	0	0.00%
< 10%	3	37.50%

Q11. Please indicate which clinical specialty you are currently practicing in?

Hospital Setting	0	0.00%
Community Health Setting	1	12.50%
School Health Setting	1	12.50%
Ambulatory Care Setting	2	25.000%
Academic Setting	2	25.00%
Other (please specify) **	2	25.00%

** Clinic, primary care

Pediatric Curriculum Evaluation

The second part of the survey contained questions to evaluate how well the content of the curriculum meets the stated outcomes. The participants were asked to answer each question using a 4-point Likert scale ranging from strongly agree to strongly disagree. This survey allowed only quantitative data collection.

Two generalized questions were asked about the cardiovascular and respiratory content of the curriculum (see Table 3). All eight participants strongly agreed or agreed that the cardiovascular (62.5% and 37.5% respectively) and respiratory content (87.5% and 12.5% respectively) met the stated outcomes.

Table 3. *Cardiovascular and Respiratory Content*

DNP (<i>n</i> = 8)	Frequency	Percentage
Q12. Does it appear that the cardiovascular content modules meet the stated outcomes?		
Strongly Agree	5	62.50%
Agree	3	37.50%
Disagree	0	0.00%
Strongly Disagree	0	0.00%
Q13. Does it appear that the respiratory content modules meet the stated outcomes?		
Strongly Agree	7	87.50%
Agree	1	12.50%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Survey questions 14 through 36 evaluated six disease disorders that were organized into four categories: pathophysiology, assessment and early identification, treatments, and applicability of the case study. For purposes of comparison and analysis, the disorders have been grouped into tables based on categorical questions. For all questions, participants either strongly agreed or agreed with the content's meeting the stated outcomes. No participants disagreed or strongly disagreed with any of the content.

As shown in Table 4, participants either strongly agreed (87.5%) or agreed (12.5%) that the pathophysiology met the stated outcomes for croup, asthma, bronchiolitis, URI and pneumonia. For RSV, participants strongly agreed (75.5%) or agreed (25.5%) that the pathophysiology met the stated outcomes.

Table 4. *Does the Pathophysiology for the Six Respiratory Diseases Meet the Stated Outcomes?*

RESPIRATORY DISORDERS	CROUP	ASTHMA	BRONCHIO-LITIS	URI	PNEUMONIA	RSV
STRONGLY AGREE	87.5%	87.5%	87.5%	87.5%	87.5%	75.5%
AGREE	12.5%	12.5%	12.5%	12.5%	12.5%	25%
DISAGREE	0%	0%	0%	0%	0%	0%
STRONGLY DISAGREE	0%	0%	0%	0%	0%	0%
TOTAL	8	8	8	8	8	8

Table 5 reveals that participants either strongly agreed (75.5%) or agreed (25.5%) that the content and assessment met the stated outcomes for asthma, bronchiolitis, URI and RSV. For croup, participants strongly agreed (87.5%) or agreed (12.5%) that the pathophysiology met the stated outcomes. For pneumonia, one participant did not answer the question, so ($n = 7$); however, participants either strongly agreed (87.5%) or agreed (14.29%) agreed that the pathophysiology met the stated outcome.

Table 5. *Does the Content on Assessment and Early Identification Meet the Stated Outcomes?*

RESPIRATORY DISORDERS	CROUP	ASTHMA	BRONCHIO-LITIS	URI	PNEUMONIA	RSV
STRONGLY AGREE	87.50%	75.50%	75.50%	75.50%	87.50%	75.50%
AGREE	12.5%	25.5%	25.5%	25.5%	14.29%	25.00%
DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
STRONGLY DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	8	8	8	8	7	8

Table 6 shows that participants either strongly agreed (87.5%) or agreed (12.5%) that the content on treatment met the stated outcomes for croup, asthma, bronchiolitis, pneumonia, and RSV. For URI, participants strongly agreed (62.5%) or agreed (37.5%) that the content on treatment met the stated outcomes.

Table 6. *Does the Content on Treatment Meet the Stated Outcomes?*

RESPIRATORY DISORDERS	CROUP	ASTHMA	BRONCHIO-LITIS	URI	PNEUMONIA	RSV
STRONGLY AGREE	87.50%	87.50%	87.50%	62.50%	87.50%	87.50%
AGREE	12.50%	12.50%	12.50%	37.50%	12.50%	12.50%
DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
STRONGLY DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	8	8	8	8	8	8

Table 7 shows that participants either strongly agreed (87.5%) or agreed (12.5%) that the case studies provided an effective learning method to meet the stated outcomes for URI and pneumonia. For bronchiolitis participants either strongly agreed (75.5%) or agreed (25.5%) that the case studies provided an effective learning method to meet the stated outcomes. For croup, asthma and RSV, participants strongly agreed (62.5%) or agreed (37.5%) that the case studies provided an effective learning method to meet the stated outcomes.

Table 7. *Does It Appear That the Case Study Scenario Provides an Effective Learning Method to Meet the Stated Outcomes?*

RESPIRATORY DISORDERS	CROUP	ASTHMA	BRONCHIO-LITIS	URI	PNEUMONIA	RSV
STRONGLY AGREE	62.50%	62.50%	75.50%	87.50%	87.50%	62.50%
AGREE	37.50%	37.50%	25.00%	14.29	14.29%	37.50%
DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
STRONGLY DISAGREE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	8	8	8	8	8	8

One participant did not answer question number 37 (see Table 8) DNP ($n = 7$).

Table 8. *Does it appear that the simulation scenarios provide an effective learning method to meet the stated outcomes?*

	Frequency	Percentage
Strongly Agree	6	87.50%
Agree	1	14.29%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Generalized curriculum. Generalized curriculum questions (38–42; see Table 9) were asked to evaluate the applicability of the identified pediatric respiratory disorders, educational needs of the ED nurses, and learning outcomes. Only seven participants answered question number 38, with either strongly agree (85.71%) or agree (14.5%). Participants either strongly agreed (87.5%) or agreed (12.5%) with question 39, which asked about the appropriateness of respiratory diseases chosen. Participants either strongly agreed (75%) or agreed (25 %) with question 40, which addressed the reflection of educational needs for ED nurses. Participants strongly agreed (62.5%) or agreed (37.5%) with question 41, which addressed the learning objectives' appropriateness for the program content. Finally, participants either strongly agreed (87.5%) or agreed (12.5%) with question 42, which looked at the applicability of the materials to other settings.

Table 9. *Generalized Curriculum Questions*

DNP ($n = 8$)	Frequency	Percentage
Q38. Does it appear that the content presented in this curriculum reflect the stated outcomes?		
Strongly Agree	7	85.71%

Agree	1	14.50%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Q39. Are the disease process chosen for this curriculum reflective of the most commonly seen respiratory diseases in the pediatric population ages 0 –24 months

Strongly Agree	7	87.50%
Agree	1	12.50%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Q40. Does the program outcomes reflect the educational needs of the ED nurses in a small rural community hospital?

Strongly Agree	7	75.00%
Agree	1	25.00%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Q41. Does it appear that the learning objectives were appropriate for the program content?

Strongly Agree	7	62.50%
Agree	1	37.50%
Disagree	0	0.00%
Strongly Disagree	0	0.00%

Q42. Does it appear that the materials presented in this curriculum can be applied over a variety of settings?

Strongly Agree	7	87.50%
Agree	1	12.50%
Disagree	0	0.00%

Strongly Disagree	0	0.00%
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Summary

In this chapter, the results from the survey were presented in detail. There were 8 participants of 21 that responded resulting in a response rate of 38%. The survey data included demographic information as well as quantitative survey data evaluating the pediatric respiratory curriculum. Discussion of the significance of these survey results and recommendations for future research will be addressed in Chapter 5: Conclusion.

CHAPTER 5: CONCLUSION

This project utilized a two-step process. The first step of the project was the development of an enhanced pediatric respiratory care course curriculum for nurses in the CVA Kaiser Permanente ED. The second step was the evaluation of the curriculum by a group of DNP students for its relevancy to practice.

Discussion

The evaluation of the curriculum by the DNP cohort provided valuable feedback regarding the content of the learning modules. All participants either strongly agreed or agreed that the content met the stated outcomes. To identify potential areas of weakness in the curriculum, results that scored less than 80% will be reviewed in more detail.

Demographic Data

Analysis of the data for questions 1–7 looked at the demographics of the participants, their specialty credentials, and any certifications. All participants ($N = 8$) were female with the majority (87.5%) working as a nurse for more than 10 years. Specialty credentials were identified as nurse practitioners ($n = 3$), educator ($n = 1$), school nurse ($n = 1$) and RNC ($n = 2$). Two of these participants had a certification in PALS, which is the minimal requirement for anyone working with the pediatric population. Questions 8–10 identified whether any of the participants had experience working with pediatric patients. The identification of individuals with pediatric experience provides better validation for the materials in the curriculum. Analysis of the data showed that 87.5% ($n = 7$) had some experience working with pediatrics and 62.5% ($n = 5$) of the participants had spent at least 30% or more of their time caring for the pediatric population in their work environment. There were also participants who identified as working in both a pediatric department and an ED.

Curriculum Evaluation

To identify whether the curriculum met the stated outcomes, survey questions were asked regarding the content. Questions 12 and 13 addressed the materials on pediatric respiratory and cardiovascular systems. The purpose of this content was to provide a foundation for nurses to compare normal versus abnormal physiology. Analysis of the data identified that 87% strongly agreed that the respiratory content met the stated outcome goal; however, only 62.5% strongly agreed that the cardiovascular content met the stated outcomes. Since the respiratory and the cardiovascular systems are interrelated in a pediatric patient, it is important to ensure that this content is well understood; thus, a revision of the cardiovascular system may be needed.

Survey questions 14–36 specifically looked at the six respiratory disorders (croup, asthma, bronchiolitis, URI, pneumonia, and RSV) whose content were organized into four different sections:

- Pathophysiology
- Assessment and early identification
- Treatments
- Applicability of the case study

Pathophysiology. The content for the pathophysiology for each disorder provided a review of the disease process on a cellular level. This information provides the nurse with a better understanding of expected symptoms and appropriate interventions and treatments. For the disorders on croup, asthma, bronchiolitis, URI, and pneumonia, 87.5% ($n = 7$) of the participants strongly agreed that the materials met the stated outcomes. However, for RSV, only 75.5% ($n = 6$) of the participants strongly agreed that the content met the stated outcomes. Since RSV is one of the more commonly seen respiratory disorders in children younger than 24 months, this material will need to be reevaluated and revised for improved understanding of the underlying pathophysiology.

Assessment and early identification. To provide appropriate and timely interventions, nurses must be able to recognize abnormal symptoms. The information in this module provided content regarding the expected symptoms and assessment of children presenting in respiratory distress. The participants were asked to evaluate whether the content met the stated outcomes. For the question on croup, the participants strongly agreed (87.5%) that it met the stated outcomes. For the question on pneumonia, one participant did not answer the question, so $n = 7$; however, 85.5% ($n = 6$) of the participants strongly agreed that it met the content. For asthma, bronchiolitis, URI, and RSV, only 75.5% strongly agreed that the question met the stated content, with 25.5% agreeing. The materials on assessment and early identification are important in providing the appropriate intervention by the nurses, so this is significant in the sense that the material will need to be reviewed and revised for clearer content.

Treatment. The content of this module was to provide nurses with a stronger foundation in understanding the types of treatments, medications, and dosages commonly prescribed for respiratory disorders. The knowledge of the medications and treatments and their expected outcomes would assist the nurse in evaluating the effectiveness of the interventions. The participants were asked to evaluate whether this met the stated outcome. The participants strongly agreed (87.5%) that the content on treatment met the stated outcomes for croup, asthma, bronchiolitis, pneumonia, and RSV. For URI, 62.5% ($n = 6$) strongly agreed and 37.5% ($n = 2$) agreed that the content on treatment met the stated outcomes. This material will need to be reviewed for potential improvement in the module.

Case study scenarios. For each respiratory disorder, a case study scenario was developed. The purpose of the case study was to integrate the symptom identification, assessment and treatment management learned in the modules. The participants were

asked whether they felt the case study scenarios provided effective training. This question showed a diverse response for each respiratory disorder. For

- URI and pneumonia, 87.5% strongly agreed and 12.5% agreed
- Bronchiolitis, 75.5% strongly agreed and 25.5% agreed
- Croup, asthma, and RSV, 62.5% strongly agreed and 37.5% agreed

The analysis of this question seems to indicate that the participants felt the case studies met some of the stated outcomes but could be improved. Since the case studies were not revolving but rather asked pointed questions, this could have affected the learner's outcome. This information could indicate that to provide effective training, each case study should be individualized versus generalized.

Generalized Content. Survey questions 37–42 focused on simulation, generalized content regarding the chosen disease disorders, and learning activities of the curriculum. Only seven participants answered the questions on simulation and generalized content reflecting stated outcome. For both of these, 85.71% ($n = 6$) strongly agreed with the content, while 14.29% ($n = 1$) agreed.

For the question 40, about whether the program outcomes reflect the educational needs of the nurses, the response was 75% ($n = 6$) strongly agreed and 25% ($n = 2$) agreed. For question 41 about whether the learning activities were appropriate, 62.5% ($n = 5$) strongly agreed and 37.5% ($n = 3$) agreed. Although all the participants either strongly agreed or agreed, the results were less than 80% for these questions, which indicates a need for reevaluation of the development of the curriculum in general. For the last question (number 42), the participants either strongly agreed (87.50%; $n = 7$) or agreed (12.50%; $n = 1$).

Limitations

This project has several limitations. The first is that this was a purposive sample with a small number (N = 8) who responded to the Survey Monkey questionnaire. This response rate may have been affected by the timing of the survey since this project was distributed to a DNP cohort who were in the middle of completing their own projects. A second limitation related to the sample size was that all participants either strongly agreed or agreed with the survey questions. A larger sample may have resulted in some participants' disagreeing with parts of the curriculum, thus providing beneficial feedback.

A third limitation may have been the decision to use the six respiratory disorders recommended by practitioners in the ED. A fourth limitation may have been the identification by this author of the knowledge deficit of the ED nurses. Since this curriculum was developed for ED nurses at a Kaiser Permanente facility in the Central Valley Area, the knowledge deficit may not have been reflective of all nurses. Consequently, the material could not be generalized to other ED nurses. Lastly, neither the curriculum nor the survey was validated by outside sources, an action that would be important prior to implementing in other organizations.

Implications for Nursing Practice

Over the last few years, the number of pediatric patients cared for in the ED has increased. The majority of these visits are respiratory related. Most nurses have limited education about pediatric respiratory disorders. Current requirements for minimal competency in most facilities is a PALS certification. This certification only addresses the arresting child. As identified in Chapter 2, very few studies discuss the provision of hospital-provided education to nurses in the ED. Studies that do address pediatric education are primarily geared toward the physician or the parents. Studies found on respiratory disorders were clinically based rather than focusing on education for staff.

Currently most nurses in the ED have to go to outside sources for extended education. If education is offered through their hospital, it is usually through a learning management system. For ED nurses to be prepared to provide appropriate care, they should have educational classes that are directed toward their needs and the needs of the patients seen in the department. The identification of respiratory distress as the leading cause for pediatric visits as well as the lack of education provided to nurses, led to the development of this curriculum. The curriculum was based on the understanding that unrecognized respiratory distress could lead to cardiopulmonary compromise in a pediatric patient 0–24 months. The goal of these educational modules would be to provide nurses with an increase in knowledge to develop a stronger foundation in respiratory disorders for improved outcomes.

Although this curriculum was specifically developed for the ED nurses at Kaiser Permanente CVA, this curriculum could be shared with other ED educators to use as a template. The process of educating nurses can be very costly and time consuming; however, with the change in dynamics in the complexity of care, it is becoming a necessity for positive patient outcomes.

Theoretical Framework

The use of Knowles's adult learning theory is supported in this quality improvement project. Knowles recognized that adults' learning needs have to be self-directed towards their area of practice. The learning can only take place if the recipients feel there is a need and are invested in the learning. Most ED nurses are uncomfortable caring for a child in respiratory distress. Since they understand that respiratory failure can lead to cardiopulmonary compromise, this awareness can lead to a desire for improved assessment skills and knowledge. The development of this pediatric respiratory care curriculum for ED nurses and the integration of case study reviews as well as simulation,

reinforces this concept. The learning now becomes a reflection of real-life practice versus just classroom learning.

Conclusion

Many nurses who work in the ED have very little pediatric education other than what they learned during their pediatric rotation in nursing school. Since the demand for nurses to be proficient in caring for the pediatric population is increasing, lack of knowledge and critical thinking can lead to poorer patient outcomes. The partnership between the IOM and the PECARN advocates for improved interventions and care for pediatric patients. These organizations' recommendations include the need for policies, protocols, and education for all staff members so they can appropriately care for this population.

In recognition of the need for pediatric education, an informal needs assessment was conducted of the nurses in the ED at Kaiser Permanente CVA. It was identified that the majority of the nurses were uncomfortable taking care of children in respiratory distress—more specifically children between the ages of 0 and 24 months. This project was developed in response to this need with a focus on the six most commonly seen pediatric respiratory disorders. It included the development of a curriculum with an evaluation of the content by a DNP cohort. The goal of the project is the implementation of the curriculum at the Kaiser Permanente ED for present and future nurses.

This curriculum is a work in progress that will take into consideration the responses from the evaluation of the survey as well as from nurses after implementation in the ED. This vital feedback will provide an opportunity to improve the curriculum's effectiveness as a learning tool. However, in its current form, it can still provide appropriate education and can be used by other ED educators as a template for curriculum development for their staff.

This project offers a unique opportunity since there are no other educational curricula found that specifically look at respiratory disorders in the ED. Respiratory failure can be the precursor to cardiopulmonary arrest in otherwise healthy children; this content can help improve the knowledge of practicing ED nurses for early identification of respiratory problems.

As the climate changes in healthcare and the community, the ED is becoming the primary care provider to pediatric patients; thus, the ED nurses are expected to provide an increased level of practice. To meet this increasing demand, organizations need to start investing educational time in their staff. This can be accomplished through a collaborative process with shared curricula and standardized practice protocols and policies across an organization. The ultimate goal for any organization should always be positive patient outcomes—educating their nurses can go a long way in achieving this.

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APPENDICES

APPENDIX A: CURRICULUM MODULES

Module 1: The pediatric respiratory system ranging from 0 – 24 months

Expected outcome: Upon completion of the module the student will be able to:

1. Differentiate between respiratory distress and respiratory failure
2. Distinguish the characteristics of the anatomy and physiology of the infant's, or child's respiratory system that increases the risk for respiratory distress
3. Assess the clinical deterioration of the pediatric patient by applying the Pediatric Assessment Triangle.

To distinguish between normal and abnormal signs and symptoms of the pediatric patient, it is important to be knowledgeable about the expected developmental behaviors, physiological states, and normal parameters in this age range. This module will assist in comparing normal assessment verses abnormal signs and symptoms. Many signs can be subtle and early recognition of these abnormalities will provide the opportunity for early intervention to prevent cardiopulmonary compromise. Since most pediatric arrests begins with respiratory failure it is important to differentiate between respiratory distress and failure.

Respiratory distress is typically characterized by signs of increased work of breathing. This can be seen by tachypnea, use of accessory muscles, retractions, nasal flaring, tachypnea, stridor, chest wall retractions, grunting, wheezing with O₂ saturation remaining between 94 – 96%. This is the clinical presentation the nurse would see when assessing the patient.

Respiratory Failure is defined as inadequate oxygenation to meet metabolic needs, a mismatch between O₂ and CO₂. Characteristic clinical assessment would be O₂ saturation 93%, increased respiratory effort with retractions, seesaw breathing, visual exhaustion as well as neurologic changes in the child (Joffe, M.D. 2015 p.32). These

signs of respiratory failure are late sign and indicates pending cardiac compromise and needs immediate intervention.

Anatomy and Physiology. The immaturity of the respiratory system of the infant and young child, can lead to cardiovascular compromise if assessment is not made in a timely fashion. In order to recognize as well as initiate appropriate goals for assessment and interventions, it is important to be familiar with the anatomical differences in the first few years of life.

- Infants have smaller nares and are obligatory nose breathers for the first few months of life and can easily be blocked by edema and mucus. It is important to make sure their nasal passages are clear to provide them with adequate oxygenation.
- Airways are narrower in diameter and when there is inflammation or blockage it can increase airway resistance both on inspiration and expiration.
- The chest wall is more compliant with less ability to recoil which requires more
- work of breathing to move enough tidal volume. This is also affected by chest wall retraction which causes the chest cavity to move inward instead of outward impeding lung expansion.
- The intercostal muscles are also poorly developed and can tire out more easily when respiratory effort is increased. Consequently, this places more reliance on the diaphragm that is still not fully developed and can be affected by any gastric distention that may impede movement.
- The lungs are not fully mature and have fewer and more easily collapsible alveoli which would normally help with collateral oxygenation during compromise. When a child is in distress this affects the ability to recover quickly.

- “Normal SpO₂ usually ranges from 97% and above, an SpO₂ of 94% to 96% is within range of a child having some respiratory distress and a SpO₂ of ≤92% is considered hypoxemic -failure” (Madden, 2013, p. 4–27) and should be looked at needing immediate intervention.

Effects on the Cardiovascular system. Infants and young children normally have an increased metabolic rate and oxygen consumption even during normal states. Typical oxygen consumption is 6–8 ml/kg/min in a child vital signs. 3–4 ml/kg/min in adult. When they are displaying mild to moderate respiratory distress, their heart rate will increase due to increased work of breathing, accessory muscle use and attempting to get adequate O₂ – CO₂ exchange. This respiratory state also depletes their glycogen stores as they are trying to compensate. The hearts myocardial fibers are shorter and less elastic which causes poor compliance and less ability to adjust stroke volume as the heart rate increases. Both situations put increase stressors on the heart until it is no longer able to compensate. After a while, the heart begins to tire out and this leads to cardiac arrest, which is more difficult to recover from. The goal is preventing respiratory failure from becoming respiratory distress leads to cardiopulmonary issues.

General assessment and evaluation of the pediatric patient. The most important part of the exam begins the moment you see the child. Ask yourself does this child look sick? Since the very young cannot tell you how they feel, the nurse needs to depend on their knowledge and assessment skills, as well as parent input and history of event. Many signs of a sick child can be subtle due to their ability to compensate for an extended period of time. The earlier abnormalities are recognized the likelihood an earlier intervention can be initiated. When examining a child, the nurse should leave the patient in a position of comfort. This could include sitting up right in the sniffing position (neck flexed, head mildly extended), sitting or lying (infant) in the parents/caretaker’s arms or

any position that will minimize stress on the child. Their initial response to any healthcare worker is a useful indicator of the extent of their illness. Infants will normally track and attune to noises as well as follow physical leads. Children up to 6 months will respond to typical cooing or tickling with appropriate responses, Children 7 – 24 months will show stranger and situational anxiety and look for comfort from their parents or caregivers. A thorough lung assessment is important and the nurse needs to utilize all tools to make an appropriate assessment. This could include a pacifier, toy or object for distraction. If the child does not respond along the continuum of expected behavior then this can be reflective of increasing severity of illness.

Figure A-1. Pediatric Assessment Triangle (Dieckmann, Brownstein, & Gausche-Hill, 2010, p. 313)



Appearance

Tone
Interactiveness
Consolability
Look or Gaze
Speech or Cry

- Signs of respiratory distress
 - Abnormal breath sounds
 - Tripod position
 - Retractions
 - Nasal Flaring

• Circulation

- Pallor
- Mottling
- Cyanosis

Pediatric Assessment Triangle (PAT). Pediatric Assessment Triangle is a system of assessment that will provide information about the physiological status of a child. It is

a quick and easy way of identifying abnormalities in a child to expediate intervention.

This system incorporates the use of neurological, respiratory and circulatory assessment.

a. Neurologic

- Does the child appear listless, quiet? (could indicate decrease oxygenation)
- Are they interactive and look at you or follow your gaze? (age appropriate)
- Do they respond to treatments or interventions? (reversible disease process)
- Are they consolable when only the parents are in the room? (age appropriate)
- What does their cry or speech (if they talk) sound like? (may be indicative of decreased oxygenation)

b. Respiratory

- What do you hear -audible wheezing, grunting (help identify upper versus lower Airway)
 - What is their work of breathing
 - Are they tachypneic or bradypneic
 - Is there nasal flaring
 - Are there retractions
 - How are they sitting
 - Are there abnormal lung sounds such as stridor, wheezing, grunting
 - What are their O₂ saturations

c. Circulation

- Are they tachycardic?
- What do their skins signs look like? (cool, pale, mottling, cyanosis)

Vital signs. For young children the heart rate and respiratory rate are the most important. Temperature becomes a factor when it is elevated as it can cause increased heart rate and respirations. If the heart rate or respirations do not change with decreasing temperature, then other evaluations need to be implemented. Blood pressure usually remains constant and will decrease when the child begins to decompensate so it is considered a late sign and not a good indicator of their status.

Table A-1. *Normal Vital Signs Reference Range*

Age	Heart Rate (beats/min)	Respiratory Rate (breaths/min)	Systolic Blood Pressure (mm Hg)
Preterm	120–180	55–65	40–60
Term newborn	90–170	40–60	52–92
1 month	110–180	30–50	60–104
6 months	110–180	25–35	65–125
1 year	80–160	20–30	70–118
2 years	80–130	20–30	73–117

(Madden, 2013, Appendix 1)

Abnormal Respiratory Symptoms. It is important to recognize both abnormal signs as well as the progression of respiratory changes from distress to failure to intervene early enough to prevent cardiopulmonary collapse. The signs of respiratory distress/failure are as follows:

- Grunting
- Stridor/wheezing
- Head bobbing
- Nasal flaring
- Inability to lie down
- Agitation or altered level of consciousness (decreasing oxygenation)
- Retractions
- Use of accessory muscles
- Prolonged expiration
- Apnea
- Cyanosis despite oxygen delivery

Recognizing Respiratory Distress YouTube video – Open Pediatrics

The link below will provide you with a visual review of abnormal signs in the pediatric patient experiencing respiratory distress

<https://www.openpediatrics.org/assets/video/recognizing-respiratory-distress?chapter=2>

Open Pediatrics. (2018).

Module 2: Respiratory Disorders

Expected outcome: Upon completion of the module the student will be able to:

1. Compare the differences between stable and unstable respiratory symptoms in the pediatric patient
2. Differentiate the pathophysiology for the six most common respiratory diseases
3. Formulate the appropriate diagnostic and therapeutic interventions for management of respiratory care plans for the pediatric patient with these six most common respiratory diseases.

Most respiratory conditions can be separated into upper and lower airway disorders characterized by the anatomical area of the airway compromise. The ability of the nurse to differentiate the symptoms between upper and lower, provides for a more appropriate and e timely intervention.

The table below provides the disease process as well as accompanying signs and symptoms that a nurse may see with each diagnosis.

Table A-2 *Localization of Respiratory Distress by Physical Findings*

Upper airway obstruction – CROUP, Upper Respiratory Infection (URI), ASTHMA
Sniffing position: neck is flexed with head extended to open airway
Nasal flaring: also seen with lower airway disease
Prolonged inspiration
Retractions: supraclavicular, suprasternal
Abnormal voice: hoarseness, hot potato voice
Stridor
Barking cough

Transmitted upper airway sounds (stertor)
Lower airway disease - PNEUMONIA, BRONCHITIS/BRONCHIOLITIS, RSV
Retractions: intercostal, subcostal
Nasal flaring: also seen with upper airway obstruction
Prolonged expiration: lower airway obstruction
Wheezing: intrathoracic airway obstruction
Grunting: may indicate severe respiratory distress or severe pain from an intraabdominal process
Rales (crackles)
Pleural rub
Bronchophony
Pulsus paradoxus: caused by severe lower airway obstruction or cardiac tamponade (Weiner, 2017)

A. Croup – (Laryngotracheobronchitis)

Croup is a viral illness that usually starts as an upper respiratory infection that causes inflammation and narrowing in the larynx immediately below the vocal folds and the subglottic airway. This causes a hoarse voice and bark like cough. There is a higher prevalence” during the fall and winter months and is more commonly seen between the “ages of 6 to 36 months (Woods, 2016 p. 1). In mild cases, the child is hoarse and has nasal congestion. As airway obstruction progresses, stridor develops with an increase in the prolonged inspiratory phase and tachypnea. The presence of stridor is a key element in the assessment of increasing severity. In this phase the child may become more restless or anxious due to the air hungry feeling. (Woods, 2016 p. 3)

Assessment and early identification

- Early identification of the children who have increasing distress
- May have elevated temp
- Mild expiratory wheezes
- Barking cough with potential hoarseness
- Inspiratory stridor with nasal flaring
- Work of breathing - Suprasternal and intercostal retractions, hypoxemia
- Drooling (later sign)
- Anxiety or restlessness, inconsolable

Treatment and medications

- Normally lab test or x-rays would not be ordered unless there is a need to rule out a possible foreign body which could present with similar symptoms.
- Minimize distress to the child that could compromise the airway
- Allow the child to remain in position of comfort
- Humidified air or O₂ (if desaturation) - decreases the inflammation and adds moisture to airway to allow for increase passage of oxygen
- If fever present give antipyretics
- Dexamethasone dosed at 0.15 mg/kg is as effective as 0.3 mg/kg or 0.6 mg/kg (with a maximum daily dose of 10 mg) if given earlier in disease process – more effective
- Prednisolone can be given but Dexamethasone is now preferred
- Nebulized racemic epinephrine is a 1:1 mixture is used for children in moderate to severe distress – children's heart rate needs to be monitored as well as observation for 3–4 hours after treatment as there could be rebound bronchospasms and maintained tachycardia

- Hospitalization and observation if decreased O₂ saturations and minimal response to interventions

Case study

A 20-month-old male is brought to the emergency department with a complaint of a cough that has become progressively worse with a harsh, "barky," cough. Today he developed a "whistling" sound when he breathes, so his parents brought him to the emergency department. His past medical history is unremarkable. Exam: Vital Signs: Temperature 37.5, Pulse 140, Respiratory Rate 36, Blood Pressure 90/64, oxygen saturation 96% on room air. He is alert, with good eye contact, in mild respiratory distress. He has a dry barking cough and a hoarse cry. (Eakin, 2002).

1. What is your first action?
2. What type of symptoms would you assess for?
3. Are there any specific tests that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor?
6. How would you know if the patient is responding to treatment?
7. What type of education would you provide the family upon discharge?

B. Asthma

Is defined as an "inflammatory disease of the airway that causes air flow obstruction. This is usually a result from narrowing of the small and intermediate airways due to bronchospasms and mucosal edema and mucous plugging". (Madden, 2013, pp.4–29). Normally children under the age of 24 months are not initially diagnosed with Asthma but will present with frequent respiratory conditions such as RSV, URI or Bronchiolitis. However, based on the symptoms, they may be treated with Asthma interventions.

Assessment and early identification

- One of the most common symptoms is wheezing during exhalation
- Cough – tight, usually nonproductive and nonparoxysmal, usually present more at night or during the early hours of the morning
- Shortness of breath
- Chest tightness:
- Tachypnea
- Retractions and nasal flaring (more severe)
- Difficulty talking or weak cry (age dependent)
- Decreased breath sounds or wheezing with decreased oxygenation is a more severe sign as airways are shutting down

Treatment and medications

- Blood work is not necessary may show elevated white blood cell count due to inflammatory disease
- Chest x-ray usually only warranted when child does not respond to treatment. Can rule out other causes
- IV hydration due to insensible fluid loss from increased respirations and inability to drink related to SOB
- Treat to hypoxemia and airflow obstruction provide oxygenation
- Corticosteroids – methylprednisolone/Prednisolone initial dose of 2mg/kg (work in approximately 1– 3 hours)
- Nebulizer treatment - Beta-Agonist (causes bronchial smooth muscle relaxation) albuterol dose 0.05 – 15 mg/kg every 20 minutes x 3 doses. Can also do continuous based on presentation of patient

- Adjunctive therapy - Terbutaline, ipratropium, magnesium sulfate and methylxanthines can be used in the patient who does not respond to initial treatment

Case study

A 2-year-old girl with history of frequent URI, is brought to the ED with increasing tachypnea and wheezing despite getting albuterol inhalation treatments at home. Her vital signs are as follows heart rate 138, respiration rate 36, pulse oximetry 91% room air. She has bilateral wheezing on expiration and inspiration and is appearing agitated. She is receiving a nebulized treatment via face mask.

1. What is your first action?
2. What type of symptoms would you assess for?
3. Are there any specific test that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor
6. How would you know if the patient is responding to treatment?
7. What type of education would you provide the family upon discharge?

C. Bronchiolitis

An acute inflammation of the lower respiratory tract that is usually caused by a virus affecting the small airways (bronchioles). It causes inflammation, edema, and excessive mucus. This inflammation and edema decreases oxygen exchange creating decrease O₂ causing increase in work of breathing. It is typically seen in late fall early winter and can cause periods of apnea in infants less than 2 months.

Assessment and early identification

- Diagnosed clinically, usually starts with cold-like symptoms initially, cough and low-grade fever less than 101.5 F

- Infant may display fussiness and difficulty feeding due to nasal discharge
- Will see tachypnea and tachycardia
- As it progresses will see increasing tachypnea, nasal flaring, retractions, crackles and wheezing with increasing severity
- Hypoxia is a good indicator of worsening condition and possible need for admission to the hospital

Treatment and medications

- Hydration/oral feeding if the infant has had difficulty eating due to nasal congestion especially since they are obligatory nose breathers
- Maintain airway with humidified supplementary oxygen to maintain saturations greater than 92%
- Beta2-agonist or racemic epi nebulized treatments can be used in severe cases but not always shown to be effective
- If Chest x-ray is ordered, may see hyperinflation and small areas of patchy, bilateral atelectasis
- CBC for more severe cases
- Rapid fluorescent antibody test for RSV or influenza

Case study

A 12week old female is brought into the ED with symptoms of difficulty breathing, congestions and reduced feeding. The mother stated that she has had cold-like symptoms for the last 2 days. Vital signs are as follows O2 saturations are 95% on room air, respiration rate 50, heart rate 170 and afebrile. Some nasal flaring noted and mild retractions, with diffuse wheezing, baby appears fussy but with a strong cry.

1. What is your first action?
2. What type of symptoms would you assess for?

3. Are there any specific test that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor
6. How would you know if the patient is responding to treatment?
7. What type of education would you provide the family upon discharge?

D. Upper Respiratory Infection (URI)

Is one of the most common complaints seen in the ED for children under the age of 2. It usually caused by the common cold that affects the upper respiratory tract and can be caused by many viruses with rhinovirus the most dominant. There is a higher prevalence during the fall and winter season but does occur all year. Infants can be more severely affected due to the nasal congestion and rhinorrhea that occurs since they are obligatory nose breathers. This congestion can lead to difficulty feeding which can lead to dehydration and increased severity in condition. The virus typically peaks on day 3 and can last up to 10 days.

Assessment and early identification

- Identify how long the symptoms have been present
- If fevers, how high, have they been treating them and what dosing of medication have they been giving
- Sneezing, nasal congestion and discharge (rhinorrhea) assess for color of discharge, can nares be suctioned is it dry or moist
- Sore throat (if able to identify), cough -can be dry and persistent related to the post-nasal drip
- Check for possible dehydration – especially infants, should question how many wet diapers, how much they are eating and fussiness. If breast feeding question how long they are latching on for and how it differs from normal

- Are they tachypneic or tachycardia, is there any grunting especially in infants

Treatment and medications

- Fevers medicate with alternating Ibuprofen and Tylenol (age and weight dependent)
- If infant/child is dehydrated, they may need more aggressive therapy and get IV fluids
- May use topical saline solution to thin out nasal secretions, for infants use nose drops and bulb syringe
- Unless infant/child are displaying respiratory distress, symptoms can be treated with supportive therapy and education for parents
- If patient presents with symptoms that have persisted or worsen for 10 days or more, then more aggressive investigation will be done such as chest x-ray, blood work to rule out other diagnosis.

Case study

2-year-old boy is brought into the ED by parents for complaints of irritability and fevers since last night. According to parent's child has had a runny nose and cough for two days, with decreasing appetite and fluid intake. Child appears slightly irritable, crying, and pulling at right ear. Vital signs temperature of 101.6 F, pulse 128/minute, respiration rate 35/minute, nasal congestion with clear discharge.

1. What is your first action?
2. What type of symptoms would you assess for?
3. Are there any specific test that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor
6. How would you know if the patient is responding to treatment?

7. What type of education would you provide the family upon discharge?

E. Pneumonia

Inflammation of the alveoli caused by bacteria that diminishes the ability for gas exchange and flow which can lead to respiratory distress and failure. Usually classified according to anatomic location. Is one of the most common infections in the pediatric age group and one of the leading diagnoses that results in overnight hospital admission for children.

Assessment and early identification

- Chest x-ray is defining diagnosis, since auscultation of lungs may not be significant based on location of consolidation
- CBC may help with assessment of long-time infection
- Chemistry panel for electrolytes would be indicated if the child had not been eating or drinking for a while
- Sputum cultures if able to get them
- Blood cultures for identifying the correct organism
- “Newborns with pneumonia rarely cough; they more commonly present with poor feeding and irritability, fussiness as well as tachypnea, retractions, grunting, and hypoxemia” (Bennett, 2017)
- Past the age of 1-month will start to see persistent cough, tachypnea, retractions, and hypoxemia as well as congestion, fever, irritability
- Infant/child may present with listless appearance at times, and poor appetite
- Nurses should be aware that pneumonia can be uncomfortable and incorporate that into their assessment as the infant/child is unable to express pain
- Depending on location and infiltration, will hear crackles, coarse sounds or decreased breath sounds on auscultations

Treatment and medications

- Monitor oxygenation status continuously as the child can quickly deteriorate
- IV fluids therapy with electrolytes if needed to maintain hydration
- Humidified oxygen titrated for oxygen saturation above 92%
- Antipyretics – Tylenol/Motrin for both fevers and discomfort
- Antibiotic therapy is based on organism and severity of symptoms treatment may be oral or IV
 - Children less than 6 months with bacterial pneumonia or remain hypoxic are usually admitted and treated with IV antibiotic Ceftriaxone 50 to 100 mg/kg per day in 1 or 2 divided doses;
 - Children greater than 6 months IV Antibiotic therapy usually Ampicillin 150 to 200 mg/kg per day in four divided doses (MAX 12 g/day) (Lexicomp, 2018)

Case study

A 13-month old boy was brought to the Ed with complaints of cough, fever, dyspnea, and increasing listlessness as well as fevers over the last few days. His oral intake has decreased and he complaints of “owies” unable to identify where. Vital signs pulse 120, respiratory rate 28, temperature 102°F and O₂ saturations of 94% on room air. Crackles are also heard on auscultation of left lobe. Chest x-ray shows a white patch seen on left side upper lobe of lung, CBC shows Total leukocytes count and lymphocytes concentrations increased with neutrophils decreased.

1. What is your first action?
2. What type of symptoms would you assess for?
3. Are there any specific test that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor?

6. How would you know if the patient is responding to treatment?
7. What type of education would you provide the family upon discharge?

F. Respiratory Syncytial Virus (RSV)

RSV is a common respiratory virus that causes cold-like symptoms that can last up to 2 weeks. Normally the condition can be treated with supportive care and allowed to run its course, however, for infants due to their immature immune system and breathing through their nose, it can become serious. RSV can lead to bronchiolitis and pneumonia that can create complications

Assessment and early identification

- Will typically show nasal congestion with rhinorrhea
- Dry cough, sneezing, fever, wheezing
- Depending on severity and age may show dehydration, with decrease appetite in kids age 1–2 years
- Babies with RSV may also:
 - Have no energy.
 - Act fussy or cranky.
 - Be less hungry than usual as well as congestion prevents them from eating which could lead to dehydration
- May see tachypnea and tachycardia with work of breathing

Treatment and medications

- Install saline and suction nose to clear passage especially for infants who are obligatory nose breathing
- May need IV hydration if there has been decreased intake
- Treat fever if present with either ibuprofen or Tylenol based on weight
- Antibiotics are not warranted since it is a virus

- RSV infection can be more serious in babies, though. Some infants might need treatment in a hospital, where they can be watched closely and receive fluids, if needed, and treatment for any breathing problems.

Case study

4-month-old boy is seen at the emergency department (ED) with rhinorrhea and tachypnea for the past 4 days. A fever that developed during the night prompted his mother to bring him to the ED. When interviewing the mother, she states that he has not been drinking or eating well for the past 1 to 2 days and had a minimally wet diaper this morning. He has had no cough, but his mother reported that when he breathes, he sounds “funny” and his chest looks funny. Vital signs: temperature 101.4 F, pulse 132, respiratory rate 54, saturations 94% on room air. He has wheezing, work of breathing with mild to moderate subcostal and intercostal retractions, nasal flaring. (Sorce, 2012).

1. What is your first action?
2. What type of symptoms would you assess for?
3. Are there any specific test that may be ordered for this patient?
4. What type of interventions would you expect the physician to order?
5. What type of medications might be ordered and what would you need to monitor
6. How would you know if the patient is responding to treatment?
7. What type of education would you provide the family upon discharge?

Simulation Case Studies

Goal of simulation scenarios: Nurses would be expected to incorporate the concepts they have learned throughout the modules to identify the type of respiratory disease process and implement appropriate assessment, interventions, and treatments. Based on their responses to the presenting scenario, nurses will follow an unfolding

pediatric care plan. The simulation scenarios are unfolding and utilize formative evaluation process that focuses on key components identified during the debriefing. A comfortable learning environment with no penalizations for questionable responses, keeping to formative evaluation process, will be adhered to.

Learning Outcomes: After completing these modules the student will be able to:

1. Analyze the abnormal respiratory patterns differentiating between upper and lower airway disorders in the pediatric patient using a focused assessment.
2. Initiate appropriate monitoring techniques to identify any changes in condition for the pediatric patient in respiratory distress.
3. Synthesize knowledge of respiratory disorders to formulate appropriate assessment and initial interventions for the child suffering from acute
4. Evaluate nursing and collaborative interventions for their effectiveness in reducing complications in the pediatric patient with respiratory distress

Simulation Scenarios

Case Study 1:

Background: 7-month-old female infant was brought into the ED by mother with complaints of respiratory difficulty. Mother states baby has been having a runny nose, cough, and feels warm for 2 days. She also has been refusing to take the bottle and is very fussy. Baby normally goes to day care. Mother is not sure how many wet diapers baby has had today

Physical appearance: baby is breathing fast respiratory rate 48 with visible green nasal congestion, heart rate 145, temperature 100.8 F.

Debriefing notes:**Case Study 2:**

Background: 19-month-old male is brought into the ED by mom for complaints of increasing cough, congestion and persistent fever. Child has also been very irritable with decrease appetite and wanting to just lay around. He was seen in the pediatrician office last week for congestion and cough but is not getting any better.

Physical appearance: Child is pale, quiet with moist cough and rapid respirations of 28.

Heart rate is 138 with a low-grade fever of 100.8 F.

Debriefing notes:**Case Study 3:**

Background: 2 year old is brought to the ED with labored breathing for 2 days that has progressively worsened. Yesterday he began to have a barky cough, and today he is making high-pitched sounds on inspiration.

Physical Appearance: toddler is sitting in his parents lap working hard to breath. He appears very anxious and slightly agitated with intercostal and suprasternal retractions. You hear high-pitched inspiratory sounds and occasional barky cough. He looks pale. (American Heart Association, 2006)

Debriefing notes:**Case Study 4:**

Physical appearance: Becky is a two-year-old toddler with difficulty breathing and wheezing. Her mother says she had this wheezing happen once before about 6 months ago, which cleared up with a breathing treatment.

Physical appearance: Becky is alert and active. She is breathing fast, with labored respirations, nasal flaring, and intercostals retractions. Her color is slightly pale and her

capillary refill is 2 seconds. Her pulse is 132 per minute, her respirations are 48 breaths/minute, her blood pressure is 90/60 mm Hg, and her axillary temperature is 97.8 F.

Debriefing notes:

APPENDIX B: INTRODUCTORY LETTER

Dear Colleagues:

02/7/2018

We are conducting a survey to evaluate a Pediatric Respiratory Course Curriculum developed for CVA Kaiser Permanente ED nurses who work in two rural community hospitals. Most ED nurses have limited knowledge and skills when caring for young children unless they have worked in a pediatric facility. The purpose of this project is to create a comprehensive pediatric respiratory core curriculum that focuses on children between the ages of 0 – 24 months and six of the most common respiratory illness that can lead to cardiopulmonary compromise.

The review of this curriculum should take you approximately 30 minutes. The evaluation tool will be accessed via Survey Monkey and will take approximately 15 minutes to complete. All responses will be anonymous and your participation in this survey is completely voluntary. You are free to skip a question or exit the survey at any time. Generalized demographic information will be collected and survey items will be based on the specific outcomes, teaching method, and evaluation process for the curriculum. Your participation in this survey is very important to us. As advance practice nurses, your input in identifying weakness in the course curriculum will help this investigator to make improvement to the materials prior to implementation.

Please find attached the Pediatric Curriculum. After you have reviewed the materials, please complete the Survey Monkey evaluation by clicking on the link below or copy and paste the link directly to your browser. By responding to this survey implied consent is assumed. Confidentiality will be maintained as all surveys are anonymously received by investigators.

Respectfully

Dr. Danette Dutra and Luzmaria Alcala-Van Houten, RN, MS, CNS

APPENDIX C: PEDIATRIC CURRICULUM EVALUATION SURVEY

Thank you for participating in this survey. You are free to choose to participate in this survey. You may also choose to stop your participation at any time. All responses are anonymous.

Part I: Participant Demographic Information

1. What is your gender

Male

Female

2. What is your age

20 – 30

31– 40

41– 50

51– 60

61 +

3. Please indicate your total number of years as a nurse

1–5 years

6–10 years

More than 10 years

4. Please indicate what is your highest level of education?

MS/MSN

Doctoral degree (PhD, DNP, EdD)

Other _____

5. Please indicate your specialty credential?

CNS

NP

- CNL
- PA
- Other _____

6. Please indicate your specialty certification if applicable?

- PALS
- ENPC
- CPN
- CCRN (Pediatric)
- CPEN
- Other _____

7. Please indicate out of your total nursing years, how many have been in an acute care setting

- 1–5
- 6–10
- More than 10 years

8. Please indicate which area(s) you currently or in the past have worked in

- Medical-Surgical unit/Telemetry
- Intensive Care unit
- Emergency Department
- Pediatrics Department
- School Nursing
- Academia
- Other _____

9. Please indicate if any part of your nursing care currently or in the past included taking care of the pediatric population; however infrequent

- Yes

No

10. If yes, what is/was the average percentage of time spent in caring for pediatric patients either currently or in the past

90 – 100 %

70– 89 %

50 – 69 %

30 – 49%

10– 29 %

< 10%

11. Please indicate in which clinical specialty you are currently practicing in?

Hospital Setting

Community Health Setting

School Health Setting

Ambulatory Care setting

Academic Setting

Other _____

Step II: Evaluation of the Pediatric Education Module

Please indicate the extent of your agreement with each of the following statements regarding the curriculum as presented. A four point Likert scale will be used with 1 - being strongly agree to 4 - strongly disagree with optional comments.

1. Does it appear that the cardiovascular content module meets the stated outcomes

Strongly agree

Agree

Disagree

Strongly disagree

2. Does it appear that the Respiratory content module meets the stated outcomes
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree
3. Does it appear that the pathophysiology for Croup meets the stated outcome
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree
4. Does it appear that the content on assessment and early identification of changes in Croup meet the stated outcome
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree
5. Does it appear that the content on treatment for Croup meet the stated outcome
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree
6. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for Croup?
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree

7. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for Croup?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

8. Does it appear that the pathophysiology for Asthma met the stated outcomes

- Strongly agree
- Agree
- Disagree
- Strongly disagree

9. Does it appear that the content on assessment and early identification of changes in condition

for Asthma met the stated outcomes

- Strongly agree
- Agree
- Disagree
- Strongly disagree

10. Does it appear that the treatment review for Asthma meet the stated outcomes

- Strongly agree
- Agree
- Disagree
- Strongly disagree

11. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for Asthma?

- Strongly agree
- Agree
- Disagree

Strongly disagree

12. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for Asthma?

Strongly agree

Agree

Disagree

Strongly disagree

13. Does it appear that the pathophysiology for Bronchiolitis met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

14. Does it appear that the content on assessment and early identification of changes in condition for Bronchiolitis met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

15. Does it appear that the treatment review for Bronchiolitis met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

16. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for Bronchiolitis?

Strongly agree

Agree

Disagree

Strongly disagree

17. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for Bronchiolitis?

Strongly agree

Agree

Disagree

Strongly disagree

18. Does it appear that the pathophysiology for URI met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

19. Does it appear that the content on assessment and early identification of changes in condition for URI met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

20. Does it appear that the treatment review for URI met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

21. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for URI?

Strongly agree

Agree

Disagree

Strongly disagree

22. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for URI?

Strongly agree

Agree

Disagree

Strongly disagree

23. Does it appear that the pathophysiology for Pneumonia met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

24. Does it appear that the content on assessment and early identification of changes in condition for Pneumonia met the stated outcome

Strongly agree

Agree

Disagree

Strongly disagree

25. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for Pneumonia?

Strongly agree

Agree

Disagree

Strongly disagree

26. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for Pneumonia

Strongly agree

Agree

- Disagree
- Strongly disagree

27. Does it appear that the pathophysiology for RSV meets the stated outcome

- Strongly agree
- Agree
- Disagree
- Strongly disagree

28. Does it appear that the content on assessment and early identification of changes in condition for RSV meets the stated outcome?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

29. Does it appear that the treatment review for RSV meets the stated outcome?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

30. Does it appear that the simulation scenario provides an effective learning method to meet the stated outcomes for RSV?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

31. Does it appear that the case study scenario provides an effective learning method to meet the stated outcomes for RSV

- Strongly agree
- Agree

- Disagree
- Strongly disagree

32. Does it appear that the content presented in this curriculum reflect the stated outcomes?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

33. Are the disease process chosen for this curriculum reflective of the most commonly seen respiratory diseases in the pediatric population ages 0 –24 months

- Strongly agree
- Agree
- Disagree
- Strongly disagree

34. Does the program outcomes reflect the educational needs of ED nurses in a small rural community hospital?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

35. Does it appear that the learning activities were appropriate for the program content

- Strongly agree
- Agree
- Disagree
- Strongly disagree

36. Does it appear that the materials presented in this curriculum can be applied over a variety of settings

- Strongly agree

- Agree
- Disagree
- Strongly disagree

Thank you that completes the survey questions