

# **FOOD INSECURITY AS A PEDIATRIC HEALTH CONCERN**

by

Keith F. Fishlock

A project brief submitted to the Faculty of the University of  
Delaware in partial fulfillment of the requirements for the degree of Doctor  
of Nursing Practice

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## ABSTRACT

*Purpose:* The purpose of this Doctor of Nursing Practice (DNP) project was to implement food insecurity (FI) screening and community resource referral during non-acute pediatric emergency room visits. *Background and Review of Literature:* FI is defined as inadequate access to nutritious food due to financial or other constraints. In 2016, over 15 million American children lived in food insecure households. Pediatric FI sequelae include neurocognitive, developmental and physical impairments. Effective FI screening and referral protocols may promote earlier identification and enrollment with services. Systematic literature review of FI screening in Cochrane, Medline, PubMed, and Scopus databases produced 1,775 peer-reviewed articles published since 2013. Of these, 28 studies met inclusion criteria of English language and pediatric ambulatory environments. *Methods:* A FI screening protocol was established in a pediatric tertiary hospital emergency department. A two-item validated tool was integrated into the electronic health record (EHR) and staff performed screening of clinically stable children and families. A diagnosis of FI was added to the EHR to promote monitoring across health disciplines and social work consulted for urgent unmet needs. An English and Spanish regional food resource brochure was distributed. Eighty families were contacted retrospectively 30 days post discharge to ascertain perceptions of the screening process and to determine their connection rate to food services. *Results:* Over eight weeks, ED staff conducted 6151 FI screens, of which 117 were positive (1.9%). Telephone follow-up was completed

with 80 families. Of these, 96.25 % had accessed one FI resource, 72.7% had accessed two or more services. *Conclusions:* Professional staff in a pediatric ED successfully developed and deployed a FI screening measure during an eight-week trial. Follow-up of those screened positive showed that they used the resources provided. Limitations included face to face social determinant screening methodologies, and truncated time period allocated for project. Still, the protocol holds promise for providing early intervention for FI, enabling children and their families to restore nutritional health. Insufficient literature existed to determine the ideal methods of successfully connecting patients to services.

Keywords: Combinations with Boolean operators 'food', 'security', insecurity', 'intervention', 'hunger', 'screening', 'pediatric', 'children', 'adolescent', ambulatory

## **Chapter 1**

### **INTRODUCTION**

Food insecurity (FI) is clinically defined as inadequate amounts of nutritious food that can be reliably accessed due to financial, social or other constraints and measured at the individual household level (Coleman-Jensen & Smith, 2017). FI has been recognized as a serious threat to the healthy development of young children (Kimbrow & Denney, 2015). A 2015 policy statement released by the American Academy of Pediatrics recommended that pediatric healthcare providers proactively screen for FI and intervene accordingly (American Academy of Pediatrics, 2015).

Coleman-Jensen, Rabbitt, Gregory, and Singh (2017) , authors from the U.S. Department of Agriculture (USDA) - Economic Research Service (ERS), revealed that over 15 million American children (greater than one in five households with children) lived in food insecure households at some point during 2016. In nearly 300,000 households with children it was disclosed that children suffered from hunger, missed meals, or were unable to eat for an entire day as there were insufficient financial resources for food. These households are described as having very low food security among children (Coleman-Jensen, Rabbitt, Gregory, and Singh, 2017). The 2015-2017 prevalence rate for overall FI in Delaware was estimated at 11.1% with 3.5% being classified as having very low food security. This was based on an average over three years from the U.S. Department of Agriculture Economic Research Service Report (USDA-ERS). Specifically examining Delaware households with children, almost one in five (19.4%) Delaware children suffer from FI (UD Center for Community

Research & Service, 2018). The USDA-ERS details that FI is highest among single parent households, African American households, Hispanic households, households at or below the poverty level, and households in urban or rural areas. The 2016 USDA-ERS statistics shown in Table 1.1 below demonstrate Delaware specific characteristics of African American, Hispanic and White children living in low-income or single parent families.

Table 1.1 2016 USDA-ERS Number and Percentile of Delaware Children Living in Low Income Families

	Number of Children	Percent
Hispanic	18,400	63%
African American	26,521	55%
White	25,928	25%
Single Parent	48,250	63%

## 1.1 Background

Nemours Children’s Health System has a tertiary care hospital and several satellite facilities serving Delaware, Pennsylvania, New Jersey and Maryland. The electronic health record utilized by the Nemours Children’s Health System is Epic™. An optional FI screening tool is available within Epic and was previously integrated into the inpatient admission database for Nemours Alfred I duPont Hospital for Children (N/AIDHC). No FI screening tool had been implemented to screen patients in the ambulatory setting.

## **1.2 Target Population**

During a review of EHR documentation in late 2016, a nutritional screening gap for ambulatory episodic care environments such as the emergency department (ED) was identified, and the lack of an equivalent screening tool was discussed with the director of the nutrition department. National and local prevalence rates support that one in six children (16.67%) are impacted by FI (Barnidge, Labarge, Krupsky, & Arthur, 2016). The N/AIDHC ED cared for nearly 60,000 pediatric patients in 2017 but did not perform screening for FI. Based on work by Coleman-Jensen, Rabbitt, Gregory, and Singh (2017) greater than one in five households with children were food insecure. Pabalan and colleagues found that nearly 50% of families that presented to a pediatric ED were impacted by FI (Pabalan et al., 2015). In a similar study with 1,157 adults, Doran and colleagues (2017) found a nearly 51% prevalence rate of FI in the emergency room coupled with frequent ED use.

Food deserts are defined as geographic areas in some rural communities that have inadequate access to affordable foods with adequate nutritional quality (Economic Research Service, USDA 2017). This is due in part to lack of supermarkets in some communities where the range of food retailers may be limited to only small urban food stores and exacerbated by some families' lack of vehicle ownership or inability to utilize public transit. A cross-sectional study conducted by DeMartini, Beck, Kahn, and Klein, (2013) demonstrated transportation barriers were a common contributing factor to pediatric FI compared to groups in food secure households. Despite significant geographic and demographic variation by county, Delaware, Maryland, Pennsylvania and New Jersey have significant numbers of scattered low-income census tracts located greater than one mile in urban settings or ten miles in rural settings from the nearest full-service supermarket. D. Nulph (personal

communication, June 18, 2018) of the USDA Economic Research Service provided the map below (Figure 1.1).

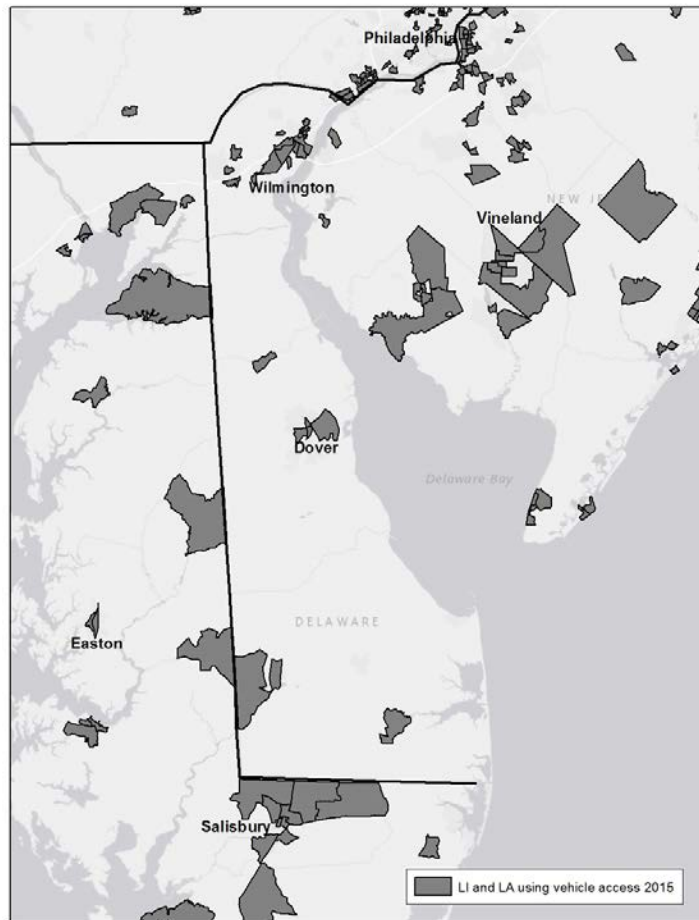


Figure 1.1 2015 USDA ERS- Food Research Atlas. Low income and low vehicle access layers for Delaware and neighboring states.

Caspi and colleagues (2017), noted that prices for 15 staple foods in 140 smaller Minnesota community general stores were 10-54% more expensive than in supermarkets. A study set in low-income urban settings surrounding Baltimore

examined store owners perceived barriers to purchasing , stocking, and promoting healthy foods (Kim, 2016). Owners mentioned customer preferences for lower prices and difficulty in procuring goods sold by wholesalers of healthy food. The target population is all children/families seeking care at the Nemours Alfred I duPont Hospital for Children emergency department.

### **1.3 Significance**

Childhood FI while centered on inadequate nutrition could be more holistically viewed as dual interlinked pathways impacting children's health and well-being. FI is not solely related to adequate calories, access to the full spectrum of micro and other nutrients and relieving hunger. Access to sufficient quantities of nutritious food is multifactorial and may include issues including lack of money, transportation or lack of nearby food stores. This in turn may contribute to distress for families which may manifest as caregiver depression and anxiety due to inability to provide food (Bi, Haak, Gilbert, & Keller, 2017; Knowles, Rabinowich, De Cuba, Cutts, & Chilton, 2016). As such, both pathways will be discussed with the foremost branch being nutritional, categorized by deficiencies in amount or quality of food in the household.

#### **1.3.1 Nutritional Pathway**

Diet quality has been inextricably linked as a predictor of health (Marshall, Burrows, & Collins, 2014). The potential impacts of micro-nutrient deficiencies from the antenatal period extending through the first five years of development and beyond have been discussed in the literature for decades (Bhan, Sommerfelt, & Strand, 2001; Bornstein, 1989; Grantham-McGregor, Fernald, & Sethuraman, 1999; Karp, Fairorth, Kanofsky, Matthews, Nelson, & Solimano, 1978; Lam & Lawlis, 2017; Liu, & Raine,

2016). Adequate protein intake impacts body composition, hormonal regulation, protein metabolism and anthropometric markers. Long term sequelae of FI for the pediatric population includes neurocognitive, immunological, developmental and physical impairments which may initially be difficult to appreciate. Epidemiologic data demonstrates that foods deemed to be of higher quality such as unrefined grains, low-fat meats, fish, reduced-fat dairy, and fresh produce are typically only available to those with higher socioeconomic status (Baumann, Szabo, & Johnston, 2017; Darmon & Drewnowski, 2015). Socioeconomic disparities may cause families impacted by transportation issues, access and lack of resources to purchase low quality food stuffs lacking in nutrients. Healthier dietary choices cost more, hence socioeconomic gradients impact dietary choices as discussed by Darmon and Drewnowski (2008). Overall, under resourced families have less access to healthy food because they can't afford it, can't gain access to purchase it or both.

Obesity is more prevalent among food-insecure children (Lee, Scharf, & DeBoer, 2018; Ogden et al., 2016). Nonuniform consumption patterns in children from 6-11 years with FI contribute to increased likelihood for obesity and a noteworthy proportion of children with FI are overweight or obese (Kaur, Lamb, & Ogden, 2015; Kral, Chittams, & Moore; 2017; Speirs & Fiese, 2015). In a systematic review of several works, Shankar, Chung, and Frank, (2017) reinforce longstanding concepts of the bivariate causal association between FI and physiologic antecedents of potentially lifelong health effects such as cardiovascular disease and diabetes. These works reinforce that FI is not solely about calories, it is about provision of a variety of wholesome foods, so the full spectrum of nutrients can be consumed. When children



cannot access these nutrients, they are more likely to consume high calorie and poor nutrient foods because they are hungry and that is what is available.

#### **1.3.1.1 Mental Health Impacts**

The second branch is characterized by mental health impacts related to the lack or quality of food (Burke, Martini, Cayır, Hartline-Grafton, & Meade, 2016). Knowles and colleagues established that FI was linked with adverse mental health sequelae in both families and their children. Parental inability to obtain adequate food and necessities for the family was inextricably linked with distress (Knowles, Rabinowich, De Cuba, Cutts, & Chilton, 2016). These events in turn contributed to mental health precursors including anxiety, depression, stress, anger, worry and shame. Alterations in caregiving practices impact the mental and physical wellbeing of children, and were associated with increases in behavioral difficulties, depression, and impaired cognitive, behavioral and social interactions. Liu and Raine (2016) opined that poor nutrition negatively impacts areas of the developing brain that play important roles in positive social behavior. Translational work from the Early Childhood Longitudinal Study by Zaslow and colleagues (2009) found indirect links to FI, depression and altered parenting practices which influenced security, attachment, and mental proficiency in toddler-hood.

#### **1.4 Measures of Household Food Security**

While several surveys are available to measure familial concerns about access to nutritious food, the current 18 item US Household Food Security Scale (HFSS) is complex to score and less practical in truncated visits in ambulatory environments (Hager et al., 2010). Cincinnati Children's Hospital Medical Center, Children's

Hospital of Philadelphia, and Centers for Medicare & Medicaid Services have incorporated an efficient two-item FI tool derived from the HFSS screening. The Children's HealthWatch Hunger Vital Sign™ by Hager and colleagues (2010) is comprised of two questions: a) Within the past 12 months we worried whether our food would run out before we got money to buy more and b) Within the past 12 months the food we bought just didn't last and we didn't have money to get more (Hager et al., 2010).

Families indicate which components of the tool are 'often true', 'sometimes true' or 'never true'. The Hunger Vital Sign™ is available in both English and Spanish versions that have been validated with sensitivity of 97% and specificity of 83% for pediatric and adolescent patients (Baer, Scherer, Fleegler, & Hassan, 2015; Hager et al., 2010). This screening tool is available without cost which was confirmed via email correspondence (see Appendix A).

### **1.5 PICOTS Question**

The PICOTS question format as described by Melnyk and Fineout-Overholt (2015) is a means for formulation of clinical questions that are both answerable, and researchable (PICOTS = Patient population; Intervention or area of interest; Comparison intervention or group; Outcome; Time, Setting). The PICOTS Question for this clinical problem is as follows: In the pediatric population (P), how does the implementation of a standardized screening protocol for food insecurity (I) compared to standard practice (C) influence referral/enrollment to appropriate resources (O) over 30 days (T) in a pediatric ambulatory emergency department (S)?

## 1.6 Theoretical Framework

A concept analysis conducted by Schroeder and Smaldone (2015) created a new conceptual model titled Food Insecurity within the Nursing Paradigm (Figure 1.2).

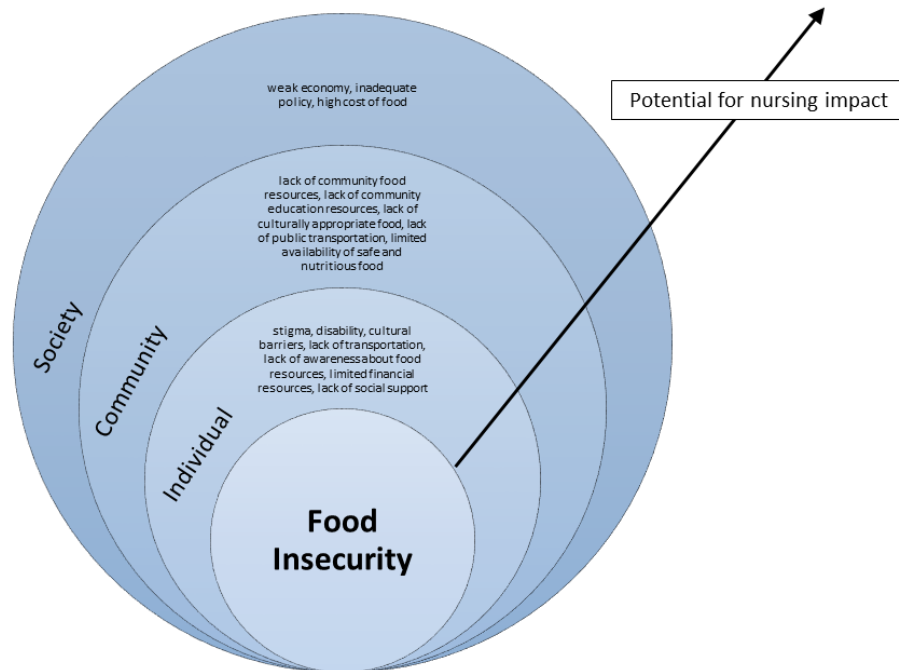


Figure 1.2 2016 Theoretical Model: FI Within the Nursing Paradigm

The authors of the model provided permission to reproduce the images (see Appendix B). Their premise is that there are multiple opportunities for nursing interventions to impact FI at three levels: societal, community, and individual. At the societal level, nurse scientists may influence policy by creating a body of nursing research around FI, as research potentially impacts policy. At the Community level (which will be the primary focus of this DNP Project), nurses can include evaluation

of FI as part of their assessment, and subsequently educate patients and families about FI and available food resources. At the Individual level, nurses can address patients' lack of financial resources as a care coordinator, helping to facilitate links with team members, such as social workers or nutritionists, who can help patients plan for food assistance upon discharge. Nurses impact individuals' health in meaningful and unique ways including advocacy, education, care coordination, and clinical care. Each of these provide avenues for nursing impact on FI.

This theoretical model served as the underpinning of this DNP practice change project. The operational definition of FI in the model is defined as lack of consistent or limited access to food, which in turn may impact attainment of healthy lifestyles, and promote feelings of physical and psychological discomfort (Schroeder and Smaldone, 2015). The 'societal level' of the framework was not directly addressed due to the time restrictions on project implementation sequence. In order to address and combat FI, the family must first be assessed. The project utilized a publicly available validated screening tool and customized referral framework to identify FI and subsequently examined the associations between FI, child health, socioemotional well-being, referral pathways and interrelationships among these outcomes.

Palakshappa, Doupnik and colleagues (2017) disclosed that families exhibited initial surprise during FI screening that was alleviated after discussion with health care providers including nurses. To ensure appropriate therapeutic discussions, staff education, scripting, and an established screening and referral framework will be developed for this DNP Project to help standardize nurses' delivery of screening questions. The development of this approach will be guided by the framework described at the 'community level.' Prefacing FI screening with a statement

emphasizing that questions are asked of all families may reduce screening associated stigma and normalize the screening process. Other concerns during screening may include potential exposure of illegal immigration status and caregiver hesitancy to disclose food hardship due to fear of disclosure to Child Protective Services (Essel, Floyd, & Klein, 2018; Palakshappa, Doupnik et al., 2017; Yang, 2015).

At the ‘individual level,’ the third rung of FI within the Nursing Paradigm Framework, healthcare providers can become more cognizant of the importance of screening for nutritional quality of food, not just adequacy. Nutritional counseling is an important facet for families as ubiquitous amounts of processed foods devoid of sound nutritional value may be present in the home, still contributing to FI. An informational food resource brochure will be created to guide families to needed available services in Delaware, Maryland, Pennsylvania and New Jersey. An internal referral process to social work will be offered to potentially assist families with accessing and navigating community resources while reducing stigma.

## **Chapter 2**

### **REVIEW OF THE LITERATURE**

#### **2.1 Search**

To gather evidence, a systematic literature search was performed between 6/14/17 and 6/20/2017 in selected databases using syntax appropriate for each search tool (Cochrane Database of Systematic Reviews, Medline database, Medline in process (Ovid), NLM MeSH Browser, PubMed, and Scopus). The search strategy foci included: (a) the overarching effects of FI on children, (b) FI screening tools validated in pediatric ambulatory health care settings, (c) family acceptability of pediatric FI screening, (d) barriers to screening in pediatric ambulatory environments, (e) ideal interventions for combating FI in pediatric ambulatory patients. Key search terms included, 'food', 'insecurity', 'pediatric', 'screening', 'children', Three Boolean operators AND, OR and NOT were used in various combinations.

Limits included English language, peer-reviewed publications issued since 2012 including primary research, randomized control trials, cohort, case control, observational or prospective studies. Secondary research such as systematic reviews and meta-analyses were also included. Searches for FI's impact on developmental, physical and mental trajectories were expanded to include earlier hallmark works. A literature search using Boolean combinations of key words 'food', 'insecurity', 'pediatric', 'screening', 'children' in Cochrane, Medline, PubMed, and Scopus databases produced a total of 1775 articles.

The results of each search were rapidly appraised for their relevance to the PICOTS question. Search (a) concerning effects of FI on children yielded 453 citations, of which 9 articles were determined to be relevant. Search (b) regarding validated pediatric screening tools produced 227 citations, of which 5 were deemed relevant research studies. Search (c) family acceptability of pediatric FI screening, yielded 56 citations of which 4 articles were relevant. Search (d) barriers to screening in pediatric ambulatory environments yielded 22 citations with 8 being selected. Search (e) ideal interventions for combating FI in pediatric ambulatory patients generated 12 results with 2 meeting criteria. Twenty-eight articles were ultimately selected and reviewed. Details of the study screening process can be found in the PRISMA flow chart (Figure 2.1).

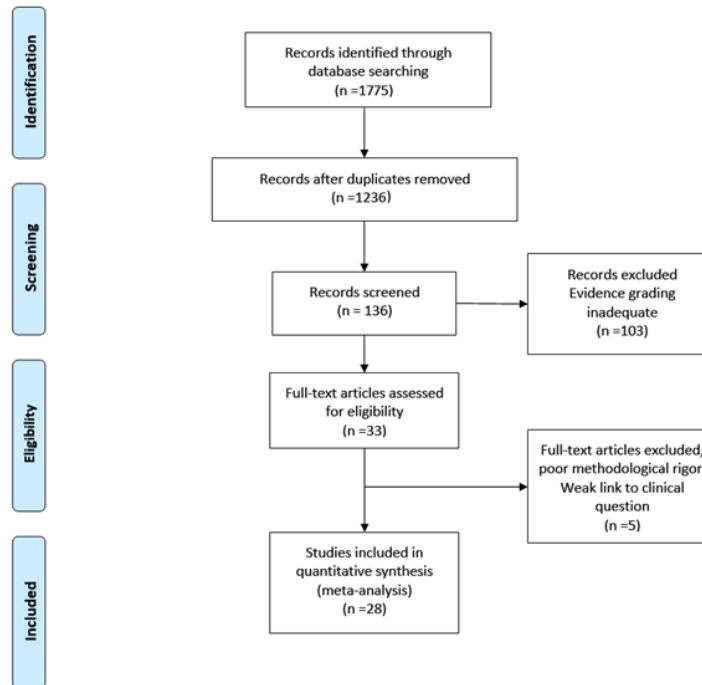


Figure 2.1 PRISMA flow chart

The twenty-eight selections met inclusion criteria of English language, ambulatory environments, and peer-reviewed periodicals published since 2012 and are noted in the Literature Review Evaluation Tables (see Appendix C). The selected articles included: four systematic reviews, three randomized control trials, six cohort studies, four cross sectional surveys, four case control surveys, two mixed methods studies, two phenomenological studies, one retrospective observational study, one grounded theory study and a prospective diagnostic accuracy study. All works were appraised using the Johns Hopkins Hospital/University Evidence leveling system. This



review appraised and synthesized research findings that were then assessed with the Johns Hopkins Nursing Evidence Appraisal Tool (Vera, 2017). Permission was obtained from the authors of the tool (see Appendix D). All components of this model were designed and evaluated by teams at The Johns Hopkins Hospital and The Johns Hopkins University School of Nursing. Two tools within part VI of the model can be used to appraise the level and quality of evidence (Vera, 2017). The two tools each consist of three categories of criteria alphanumerically coded as lower being superior including Levels I-V respectively ranging from randomized controlled trial (RCT) or meta-analysis of RCTs to experiential and non-research evidence. Research quality schemes utilize letter grades of “A” (high) to “C” (low/major flaw) correlating with higher sampling rates, adequate controls and consistent recommendations/scientific rigor to poor evidence, inconsistent results and inadequate conclusions (see Appendix E).

## **2.2 Synthesis**

The literature review supports the need for a screening and referral framework for vulnerable pediatric populations presenting to the ED. ED utilization is higher amongst impoverished children, those utilizing Medicaid, or with lower parental education (Kroner, Hoffmann, Brousseau, 2010; Peltz et al., 2017; Schlichting, Rogers, Gjelsvik, Linakis, & Vivier, 2017). Emergency settings may be the primary means of medical care for families at higher risk for FI (Alpern et al., 2014; Montalbano, Rodean, Kangas, Lee, & Hall, 2016). Nearly half of families presenting with children to a pediatric ED reported FI (Pabalan et al., 2015). Multiple studies indicated the brief (2-item) FI screening tool, The Children’s HealthWatch Hunger Vital Sign, is validated for use in the ambulatory setting and offers high specificity and

sensitivity as well as ease of administration (Barnidge, Labarge, Krupsky, & Arthur, 2017; Baer, Scherer, Fleegler, & Hassan, 2015; Hager et al., 2010; Makelarski, Abramsohn, Benjamin, Du, & Lindau, 2017; Pabalan et al., 2015; Palakshappa, Doupnik et al., 2017).

Existing research suggests screening adds a minimal time burden to the clinical encounter (Baer, Scherer, Fleegler, & Hassan, 2015; Palakshappa, Vasan et al., 2017). The implementation of a standardized protocol increased both rates of screening and referral as well as improving families' ability to connect with services (Garg, Toy, Tripodis, Silverstein, & Freeman, 2015; Lane, Dubowitz, Feigelman, & Poole, 2014). Multiple works demonstrated that caregivers have favorable opinions of healthcare provider's role in screening and addressing social determinants (Colvin, Bettenhausen, Anderson-Carpenter, Collie-Akers, & Chung, 2016; Gottlieb, Hessler, Long, Amaya, & Adler, 2014; Palakshappa, Doupnik et al., 2017).

Controlling for established child development correlates, children from low-income households with FI are more likely to be at neuro-developmental risk (Cook & Frank, 2008, Shankar, Chung, & Frank, 2017). Knowles and colleagues (2015) established that FI was linked with adverse mental health sequelae in both families and their children. Parental inability to obtain adequate food and necessities for the family was inextricably linked with stress and mental health precursors for families and children including anxiety, depression, anger, worry and shame, behavioral difficulties, and impaired cognitive and social interactions. There are multiple points where nursing advocacy and interventions can impact the trajectories of patients exhibiting FI.

### **2.3 Project Recommendations**

It has been discussed in the literature that ED utilization is higher amongst impoverished children, those utilizing Medicaid, or with lower parental education (Kroner, Hoffmann, & Brousseau, 2010; Peltz et al., 2017; Schlichting, Rogers, Gjelsvik, Linakis, & Vivier, 2017). Hence, the ED may be the primary means of medical care for families at risk for FI (Alpern et al., 2014; Montalbano, Rodean, Kangas, Lee, & Hall, 2016). In a systematic review, Malecha and colleagues reinforced the concepts of EDs across the United States serving as social safety nets for vulnerable populations with many unmet material needs (Malecha, Williams, Kunzler, Goldfrank, Alter, & Doran, 2018). Due to socioeconomic factors, families with FI may be faced with a choice of buying food before medication, taking medication less often as they couldn't afford more or delaying purchases of medication (Biros, Hoffman, & Resch, 2005; Sullivan, Clark, Pallin, & Camargo, 2010). The overarching goal of this project is to establish a screening and referral framework to identify pediatric patients at risk for FI and provide referral pathways to assist families to connect with needed services. This goal is supported by the above research findings.

The synthesis of this peer-reviewed evidence on FI screening in pediatric ambulatory environments highlights a number of important findings relevant for healthcare providers and administrators. Given the populations served, EDs are well poised to provide resources to families that screen positive for FI (Alpern et al., 2014; Montalbano, Rodean, Kangas, Lee, & Hall, 2016). Screening for food security should become a higher priority in ambulatory settings including ED's. The literature demonstrates FI has the potential to alter life trajectories of vulnerable populations including children impacting physical, mental and developmental wellbeing (Rose-

Jacobs et al., 2008; Shankar, Chung, and Frank, 2017). The DNP Project will implement a standardized FI screening and referral protocol for all clinically stable ED pediatric patients to demonstrate benefit received as a result of this practice change.

As Pabalan and colleagues (2015) disclosed, many food insecure families were unaware of community resources to assist with providing food and even those families knowledgeable about communal resources continued to report FI. Melchior et al., (2012) described comprehensive post health visit phone-based assistance to aid families in aligning themselves with community services, however this service did not significantly increase enrollment. Single page handouts can be created to help align families with services by detailing available community resources and pertinent contact and eligibility criteria. Telephone follow-up by medical office staff should ideally occur at 30, 60 and 90-day intervals to determine family's success with connection to needed services and potential necessity to escalate to social work if families efforts are ultimately unsuccessful (Gottlieb et al., 2016).

The American Academy of Pediatrics released a resource entitled Addressing FI: A Toolkit for Pediatricians retrieved from <http://www.frac.org/wp-content/uploads/frac-aap-toolkit.pdf>. This 39-page document provides several tools and resources to help pediatric teams educate and train staff, schedule regular screenings, incorporate FI screenings into workflows and address FI in a sensitive manner. The review of literature noted ideal methodologies and techniques surrounding FI referral and follow-up were not readily identified as numerous heterogeneous outcome variables limited the ability to deduce comparative effectiveness. Palakshappa, Doupnik and colleagues (2017) found third party referral services ineffective in assisting families with obtaining benefits. An additional finding

was not all patients who screen positive for FI will welcome referral or assistance in connecting with food resources (Bottino, Rhodes, Kreatsoulas, Cox, & Flegler, 2017 Hassan et al, 2015).

In a randomized control trial (Gottlieb et al., 2016), demonstrated personal onsite resource navigation services offering follow-up meetings every two weeks for up to three months, significantly decreased reported social needs while improving children's overall health status compared with providing an informational brochure. Overall, most researchers agreed that improved methods of connecting families to local resources may be needed.

Effective FI screening necessitates screening tools that are brief, integrate seamlessly into the clinical workflow and require well-trained healthcare providers (Essel, Floyd, & Klein, 2018). Clinicians reported an established framework and defined resources allowed for more time to talk with families, instead of having to search for resources reinforcing the utility of a standardized screening protocol (Adams et al. 2017). However, screening alone is not enough as routine screening without associated interventions are unlikely to contribute to positive outcomes for children and families and may cause frustration for healthcare workers and families alike (Garg, Toy, Tripodis, Silverstein, & Freeman, 2015).

## **Chapter 3**

### **METHODOLOGY**

#### **3.1 Setting**

Nemours Alfred I duPont Hospital for Children (N/AIDHC) is a tertiary academic teaching hospital and part of the larger Nemours Children's Health System offering intensive and acute inpatient and outpatient services covering more than 30 pediatric specialties. The physical setting for this project was the N/AIDHC ED, a level one trauma center situated in the city of Wilmington, New Castle County, Delaware serving children of all ages residing in Delaware, Pennsylvania, Maryland and New Jersey. There were 60,000 pediatric patients that received emergency services in 2017.

Prior to developing the implementation plan, the conceptual elements of the project were discussed with the administrative and management team at N/AIDHC. The proposed change initiative involved implementation of a FI screening protocol as a standard of care for all clinically stable pediatric emergency patients. The plan was favorably received and identified as a benefit to the organization enabling it to close an identified gap in services identified during the 2016 nutritional screening assessment for ambulatory episodic care. Administrative approval was necessary to allow the Epic screening tool in the ED electronic health record documentation to be activated. Following administrative approval to explore this project, Nemours and University of Delaware IRB applications were submitted and approved, Institutional Review Board # 1285429 (see Appendix F). The department staff includes 90

registered nurses, 20 non-licensed staff, 24 physicians, 8 physician assistants and 3 advanced practice nurses.

### **3.2 Participants**

The DNP Project change initiative involved implementation of a FI screening protocol delivered to clinically stable pediatric emergency patients, thus making this a standard of care. Acuity in the Nemours ED is determined by the Emergency Severity Index. The Emergency Severity Index (ESI) version four, is a five-level ED triage system that provides clinically relevant stratification of patients into five groups from one (most urgent) to five (least urgent) based on acuity and number of resources required (Dugas et al., 2016). Clinically stable means the patient was assessed as Emergency Severity Index (ESI) 3,4, and 5. Exclusion criteria included children assessed to be ESI 1 or 2 who had acute illness or unstable life-threatening injuries where additional routine screening may have caused delays in emergent care. As support materials were only available in English and Spanish, screening of families for FI was limited to those speaking these languages.

### **3.3 Implementation Plan**

An administrative stakeholder meeting was led by the team leader, with the DNP Project Site Mentor, Nemours Emergency Services leadership, the director of Social Work, the director of Nutrition Services, representation from Nemours Health and Prevention Services, a representative from informatics and the SNAP Outreach Coordinator for the Foodbank of Delaware. A stakeholder prioritization matrix is included (see Appendix G). As sound communication and collaboration amongst multidisciplinary teams is requisite to pilot intervention success, the purpose of the

stakeholder meeting was to review in detail the proposed implementation plan for the project in preparation for its launch, including the electronic screening tool in Epic. A SWOT analysis was conducted to acquire feedback on the stakeholders' perceptions of the strengths, weaknesses, opportunities and potential threats of the proposed plan. Weaknesses involved dependence upon marketing and information technology stakeholders in meeting project deadlines. Identified threats included a lack of electronic health record reporting functionality, unknown variables around family's perceptions of FI screening, unknown staff compliance with screening and referral protocol and managing screening and referral with barriers of seasonal high volume. Potential strategies to overcome identified obstacles were discussed resulting in changes to the plan proposal including a formal request support to leadership for creating the electronic health record reports required for project data.

### 3.4 Project Timeline

Details regarding the timeline of the completed phases of implementation are depicted below (Figure 3.1).

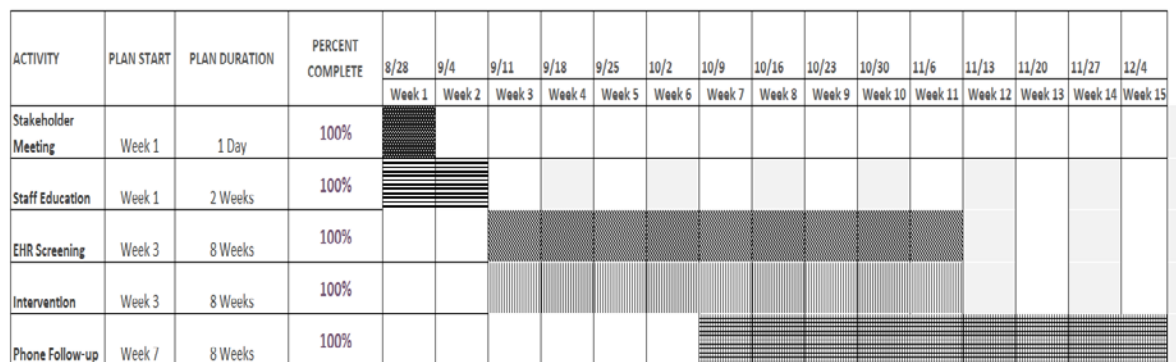


Figure 3.1 Gantt chart showing project duration



### **3.4.1 Phase 1: Pre-launch Plan, August 28-September 10, 2018**

The educational plan was implemented for nurses, clinicians and social workers within the ED over two weeks. There were 16 scheduled training sessions 30 minutes in length that were provided weekdays and weekends on both day and night shift. All licensed staff were expected to attend and 127 of 155 clinical staff from the ED and social work were trained during this juncture. The remaining staff were trained during other forums including physician business meetings, nursing staff meetings and social work staff meetings. The trainings incorporated concepts surrounding FI and included the recommendation by the American Academy of Pediatrics that healthcare providers screen all children for food security using the validated two item Children's HealthWatch Hunger Vital Sign™ screening tool (Council, O. C. P., 2015). The demonstrations included the integration of the Hunger Vital Sign screening tool within the electronic health record, the best practice alert (BPA) functionality, the interpretation of results of the screening and the process for distribution of the food resources brochure (see Appendix H).

The nursing staff role included introducing the screening questions to the family/parent/caregiver utilizing the script embedded within the electronic health record: "We ask all of our patients about access to food because it's such an important part of managing your child's health". Return demonstration was a component of the training to ensure that staff understood how to present these concepts to the families and score FI with the tool. When consulted for patients with FI concerns deemed emergent (no formula for infant or homeless), social workers assisted with helping

patients navigate referrals for emergent needs and ongoing resources and the processes for applying for federal and state programs.

### 3.4.1.1 Phase 2: Launch of FI Screening Protocol, September 11-October 9, 2018

The Hunger Vital Sign previously integrated into the electronic health record pre-launch was activated as a routine screening protocol for clinically stable children. An overview of the process is depicted below (Figure 3.2).

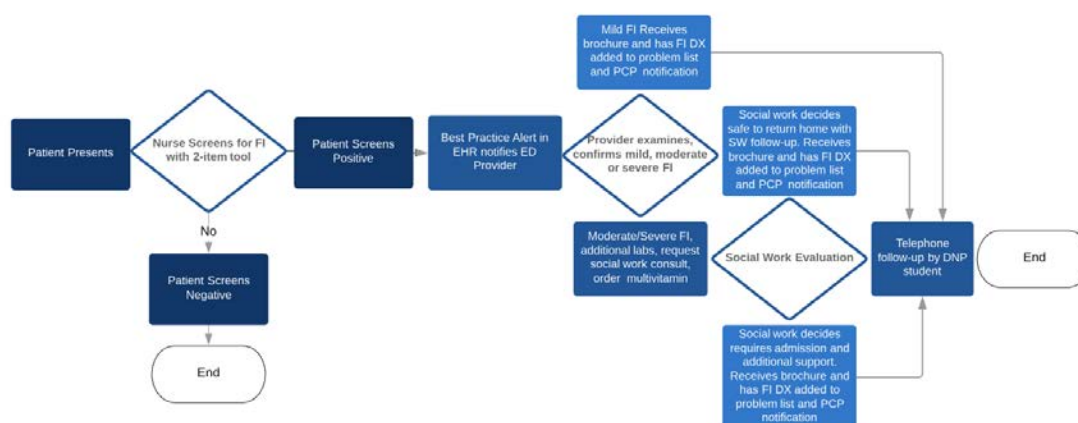


Figure 3.2 ED FI Screening Process

Families were asked to respond with "often true", "sometimes true", or "never true" to statements about their household in the last 12 months. "We worried whether our food would run out before we got money to buy more." "The food we bought just didn't last, and we didn't have money to get more." (Hager et al., 2010). A response of "often true" or "sometimes true" to either statement was deemed a positive correlation with FI. As the nurse conducted the screening if a patient or family response elicited

“often true” or “sometimes true” an electronic best practice alert (BPA) notified the emergency provider within the EHR that the screening was positive. This prompted further discussion between the family, nurse and provider to determine the presence of any emergent needs to be addressed prior to discharge. If a family declined to answer the voluntary screening questions, the screening was not completed. All identified emergent support such as need for immediate food or shelter were addressed by social work consults resulting in live or telephone interactions with families to best meet their needs prior to discharge disposition. Social work assisted with helping patients navigate referrals for emergent needs and ongoing resources and the processes for applying for federal and state programs.

After confirming the positive screening with the family, a medical diagnosis of FI (Z59.4) was added by the ED provider to the patient’s problem list within the electronic health record. In the Epic electronic health record, the problem list is visible across all venues of care (ambulatory, ED and inpatient). The FI diagnosis prompted additional notification to the primary care provider if that provider's information was available within the electronic health record.

The team leader designed a brochure describing local resources, state and national food assistance programs and organizations that could assist with application processing and received branding assistance and approvals from the Nemours marketing division (see Appendix H). All patients screened positive within the ED received the single page food resources referral brochure as part of their standard discharge instructions. Staff were queried by the DNP project team leader each week during Friday huddles to elicit feedback on issues or barriers to screening. Limited

observations were conducted by the DNP project team leader to observe that screening questions were consistently and correctly being performed.

#### **3.4.1.1.1 Phase 3: Telephone Follow Up, October 9 -December 9, 2018**

The purpose of the phone calls were to 1) ascertain families perceptions of safety and comfort while being screened for FI in the ED, 2) determine if families were successful in connecting to specific services, and 3) if they experienced difficulty in understanding how to apply for benefits that might reduce food insecurity.

A number of practical issues must be considered while examining this strategy and determining the number of subjects for telephone follow-up. One of the most essential elements to consider is that retrospective phone calls to families may be ineffective as some families cannot be reached in follow-up. If contact is successful eligible subjects may be unwilling to participate. In contemplating a construct, this potentially requires selecting more subjects than the final number of subjects determined for the sample. In an attempt to provide context for predicted positive screening rates, comparisons were drawn from a study utilizing convenience samples within a pediatric ED, of which 45.6% of 309 participants, reported food insecurity (Pabalan et al., 2015). While the Nemours ED project did not utilize a convenience sampling methodology, if 45.6% of those screened for FI were positive, this may have resulted in over 3,600 positive screens over the eight-week data collection period or 462 positive screens per week. The project was challenged with various constraints around selecting the follow-up sample due to practical reasons including time allotted during a single semester and personnel (project leader only performing call back). It was determined that an achievable number of follow-up calls would be 100.

Based on these assumptions and anticipating a much greater number of FI positive participants, to ensure selection of individuals was random and unbiased 150 encounters were to be identified by selecting every 20th positive screen on a rolling report. This over selection was decided upon to balance inability to contact due to telephone access challenges. As there were only 117 positive screens within the eight-week study period, it was determined that the project leader would attempt to call back 100%.

#### **3.4.1.1.1 Phase 4: Project Close Out, November 30-December 9, 2018**

The DNP project was successfully completed within the N/AIDHC ED. Prior to formal analysis, preliminary raw findings were shared with all stakeholders. In meeting with staff nurses, a suggestion was made to move the screening tool within a different section of the physical assessment. The nurses felt this would promote more screening compliance as the triage area is very fast paced and screening in the actual ED room would afford more time. This change is slated to occur in June 2019 after an EHR upgrade is completed. The nurses will continue to screen for FI, and ED providers will continue to ascertain the extent of FI and escalate to social work as necessary to meet patient and family care needs. All families screening positive receive the food resources brochure. As this DNP project is now complete and the telephone data sample was obtained, the telephone follow up portion of the project is concluded.

### **3.5 Management of Ethical Considerations**

Prior to initiation, Nemours and University of Delaware IRB applications were approved, Institutional Review Board # 1285429 (see Appendix F). The screening

questions were voluntary in nature and not required to be answered. All identified emergent needs were addressed by social work in conjunction with nursing and the emergency provider prior to discharge. The purpose of this DNP Project was the implementation of a structured FI screening and referral protocol for ambulatory patients at N/AIDHC ED. This initiated a standard of care on identification and intervention for FI in the ED. Mild distress that arose from screening (two families) was managed by consulting social work who provided more detailed explanations to families regarding the universal FI screening process for all patients. All participants were protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) which, among other guarantees, protects the privacy of patients' health information (Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules, 2013).

The primary care physician listed in the electronic health record was routinely confirmed during the ED visit for each patient to prevent information dissemination to a provider no longer associated with that patient. All information collected as part of evaluating the impact of this project was aggregated data from the project participants and did not include any potential patient identifiers. The risk to patients participating in this project was no different from the risks of patients receiving standard care.

The ED routinely collects the patient's primary phone number and call back information and records these within Epic as a component of future patient follow-up. The information for the team leader to initiate family phone calls was obtained through the Epic electronic health record and was not removed or transcribed from that platform. All phone calls were made from a private hospital office to ensure patient confidentiality.

Participant confidentiality was assured by coding the participants using individual identification numbers for any analysis activities occurring outside of the electronic health record. This digital information was stored in accordance with University of Delaware and Nemours IRB policies and procedures which includes storage in password protected files, on hospital-maintained servers as well as including secure erasure when appropriate. The Excel files containing codified data without protected health information (PHI) were stored in password protected files at Nemours, on a password protected desktop computer in a locked office space. Currently, the Epic report specific to this DNP project was scheduled to be decommissioned on December 31<sup>st</sup>, 2018 and this deletion has occurred.

### **3.6 Data Collection**

To assess the likely sample for the current study, the project leader reviewed Nemours Emergency Department average daily census for the time frame between 8/28-11/27/2017 which was one year before the current study timeframe. The 2017 sample included a total of N=1,181 pediatric patients each week. The daily patient nadir ranged from 130 to a zenith of 205. The acuity level by ESI rating placed 86.87% of patients at levels three, four or five (the levels that meet the 2018 project inclusion criteria. These data show a 2017 census of 8176 patients that informed the 2018 predictive census of 8258 (2017 value of 8176 plus an additional one percent which is the historical ED annual patient increase). This in turn informed the project leader to anticipate screening approximately 8,000 patients over eight weeks.

The original intent of this project was to collect information from families who met inclusion criteria and were screened for FI. Work by Palakshappa and colleagues (2017) demonstrated that parents exhibited mixed emotions related to screening and

difficulties in accessing food including surprise, comfort, shame, frustration, and helplessness. As a result of these findings, the team leader felt that evaluation of the overall family perception and experience of FI screening was an important aspect of this project. The team leader formulated an initial plan to contact 100 families via phone 30 days after discharge to capture perceptions of screening for FI in the ED setting as well as their success in utilizing the food resource to connect with new services.

While overall department screening data is collected in a FI dashboard, FI screening data specific to this DNP project change was collected from September 11th, 2018 until midnight of November 9th, 2018. The end date was selected to ensure 30-day telephone follow-up would be completed within the confines of the DNP semester coursework. Patients were screened twenty-four hours per day, seven days per week. The number of participants during the 2018 project period who met eligible criteria to be screened were 8292. A total of 6,151 (74.2%) had completed FI screens. The remaining 2,141 patients had blank flowsheet rows indicating that the screening was not completed by the nurse, or the family refused to answer.

There was no mechanism built within the electronic health record to record refused versus not completed screening and as such can be deemed a limitation of this project. While overall literature related to screening for FI in the pediatric ED is scant, Pabalan and colleagues (2015) performed a cross-sectional study at Children's Hospital of Wisconsin's Emergency Department over an eight-week period in 2013 to ascertain frequency of food insecurity in families in an urban pediatric emergency department. In that study a convenience sample of 309 caregiver participants utilized



a paper screening tool that was left with families and picked up after being completed, yielded a 45.6% prevalence of reported FI (n=141) .

The face to face screening methodology for this DNP project employed a two-item live query as part of the rapid assessment for all ESI level 3-5 patients that spoke English or Spanish which elicited a 1.9% prevalence of FI (117 positive screens) over the eight-week data collection period. The rate of FI disclosure was much lower than that reported in a similar setting by Pabalan and colleagues (2015). While results over the eight-week data collection period were less than reported studies, some possible explanations may be related to the introduction of new screening processes and expectations for the staff, as well as caregiver acceptability and discomfort with discussing FI within the emergency setting with unfamiliar nurses and providers. In a 2019 systematic review performed by De Marchis et al., between 66% and 88% caregivers of pediatric patients found screening acceptable and respondents primarily preferred a self-administered screening (De Marchis, Torres, Fichtenberg, & Gottlieb, 2019). Barnidge and colleagues (2017) described factors including fear of stigmatization or potential anxiety of family services involvement as a consequence of FI disclosure (Barnidge, Labarge, Krupsky, & Arthur, 2017).

### **3.7 Apparatus/Materials**

Electronic health record data was available via the Epic reporting functionality in the form of a daily report to determine the number of children that screened positive for FI from the previous 24 hours. This report, housed within the secure, password protected Epic platform was comprised of descriptive statistics including: discharge diagnosis weight, age, race/ethnicity, insured status and zip code. The electronic health record Epic<sup>TM</sup> continues to hold the Hunger Vital Sign screening tool, which consists

of two statements for families, and a positive response to either statement is indicative of the family or individual potentially being food insecure (positive screen).

### **3.8 Data Analysis Methods**

The Hunger Vital Sign (see Appendix J) has a sensitivity of 97% and specificity of 83% (Baer, Scherer, Flegler, & Hassan, 2015; Hager et al., 2010). Phone calls that were placed to patients previously recorded preferred phone number in the electronic health record were used to assess participant perceptions of screening and to determine if the resource brochure aided in connection with additional local resources. This was tracked using a food insecurity follow-up questionnaire (see Appendix K). Follow up telephone calls by the team leader were initiated on October 9th, 2018 and ended December 7th, 2018 and resulted in successful contact with 80 of 117 families that screened positive for FI. Once telephone screening was completed, all patients that screened positive for FI had all potentially identifiable data removed and were assigned a participant ID ranging from 001 to 100 prior to data analysis.

Quantitative component data collected for the project included the number of patients screened for FI during the eight-week data collection period, overall detected prevalence of FI within the N/AIDHC ED as measured by an affirmative response to either of the two validated screening questions and discussion of the positive subset of the 74.18% patients screened. Comparisons of age, race/ethnicity, insured status and zip code as demographic sectors as well as families perceptions of safety and comfort while being screened for FI in the ED were completed. Families success in connecting to specific services and if they experienced difficulty in understanding how to apply for benefits were also examined though use of a telephone questionnaire (see Appendix K). Quantitative component data collected for the project was extracted

into Microsoft Excel spreadsheets and analyzed using Excel functions. Target population demographic characteristics were analyzed using descriptive statistics by the DNP project leader.

### **3.9 Project Budget**

This initiative was purposefully designed to require minimal financial support. The Children's HealthWatch Hunger Vital Sign was a previously existing component within the Epic electronic health record infrastructure and did not require informatics team design resources. It required a project request from the project team lead to enable the functionality within the ED's EHR. The team leader designed the brochure and received branding assistance and approvals from the Nemours marketing division. The single page brochures were distributed as part of the discharge paperwork for FI positive screens with a minimal financial impact totaling less than \$10.00 per 500 brochures. The burden to nursing staff to perform screening was minimal with a time factor of less than one minute. As providers within the ED routinely screen patients for physical and mental wellbeing, associated time factors related to FI were negligible adding one-four minutes per patient and did not appreciably contribute to increased clinical team time.

The greatest anticipated costs were associated with referrals to the social work department. Social workers often provide support for the psychosocial issues that affect high frequency ED patients. While screening revealed a higher prevalence of previously unaddressed FI, the USDA household food security reports for households that exhibit very low food security in this region hover at 3% (USDA-ERS). Patient populations with very low food security are those most likely to require social work interventions. The director of social work at Nemours disclosed that social workers

earn an average of \$73,714, ranging from \$56,187 at the 25th percentile to \$87,044 at the 75th percentile (personal communication, June 4, 2018). An hourly estimate of the cost to provide social work support for each family requiring referral for FI was extrapolated as costing between \$27.01-\$41.85 per hour.

During the course of this DNP Project, social work required two hours of total intervention time for two families presenting with emergent food needs. This equated to one hour per family. Any future potential workload increases in supportive care will need to be considered with regards to sustainability of the standard of care screening and social work follow-up for emergent food needs. Intangible cost benefits of addressing FI include improvements in hospital overcrowding, patient flow, and non-emergent use of the ED. From a social justice perspective, interventions to improve nutritional status may reduce readmission rates for chronically ill children impacted by poor nutrition, due to improved health status and lead to less overall medical needs.

### **3.10 Dissemination Plan**

Oral presentation will be presented to project site and external key stakeholders which include pediatric providers, social workers, dieticians, and food bank leaders. Abstract submissions will be tendered to professional nursing organizations for poster and/or oral presentations including the Emergency Nurses Association (ENA) and the Eastern Nursing Research Society (ENRS). The culmination of this work will be offered as a manuscript for publication consideration in the American Journal of Nursing.

## Chapter 4

### RESULTS/INTERPRETATION

#### 4.1 Interpretation of Findings

The 117 participants that were identified as food insecure were the primary caregivers who presented to the ED with the child for both emergent and non-emergent health problems. Most participants had Medicaid as their insurance ( $n = 99$ , 84.620%). Of these 51 (43.6%) identified as female and 66 (56.4%) identified as male. Over half of the children ( $n=63$ , 53.85%) were ages five and under and the average age of all children was 5.88 years old ( $SD = 5.090$ ). Most participants reported their ethnicity as non-Hispanic or Latino ( $n = 82$ , 70.09%) with the remainder ( $n=35$ , 29.91%) identifying as Mexican, Mexican-American, Puerto-Rican, or other Spanish origin. Race was described as white or Caucasian ( $n = 28$ , 23.93%) black/African American ( $n = 53$ , 45.3%) or other ( $n= 36$ , 30.77%). The average weight of children in kilograms was 30.06 ( $SD = 21.944$ ), average height in centimeters 102 ( $SD = 45.34$ ) and the average BMI score was 18.55 ( $SD = 4.643$ ) as shown below in Table 4.1. Heights and BMI are not typically obtained in the ED environment.

Table 4.1 Weight, Height and BMI of Children that Screened Positive for FI in the ED

	<i>N</i>	Range	Minimum	Maximum	<i>M</i>	<i>SD</i>
Weight in Kg	117	92.10	5.50	97.60	30.06	21.944
Height in Cm	15	153.02	45.1	198.12	102	45.34
BMI Score	15	15.75	13.75	29.50	18.55	4.643

The acuity level by ESI rating placed 9% of patients at level 2 ( $n=10$ ) and the remaining 91% of patients at levels three, four or five ( $n=107$ ). While patients with an ESI level of 2 or lower were excluded from screening, data that was inadvertently collected was included in the analysis. There were variations of 58 different ICD10 codes. The most common reason that children with FI presented to the ED was for respiratory ailments including upper respiratory infection URI (13.8%), moderate persistent asthma (5.0%) and acute obstructive laryngitis (3.8 percent).

While participants with FI represented different areas within the states of DE, MD, NJ and PA, the most common areas that patients came from were located in Delaware and included New Castle, 19720 ( $n = 34$ , 29%), Wilmington, 19802 ( $n = 19$ , 16.2%), and Elsmere, 19805 ( $n = 14$ , 11.9%). These areas are depicted below (Figure 4.1).

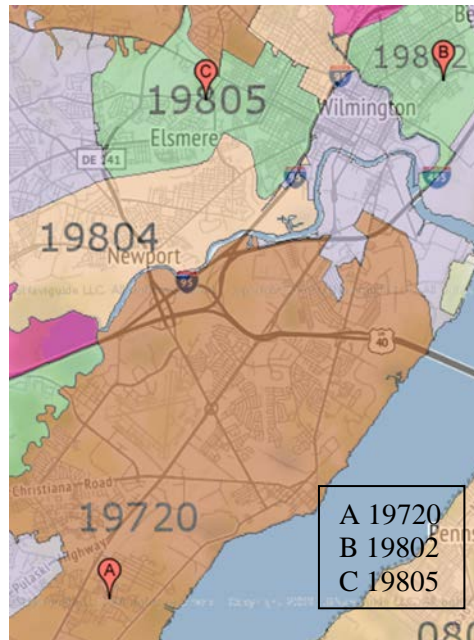


Figure 4.1 Regional distribution of identified FI children and families attending the ED.

The 2019 SocioNeeds Index, created by Conduent Healthy Communities Institute, is a validated measure of socioeconomic need stratifying the highest risk zip codes correlated with poor health outcomes that can benefit most from supportive health and social programs (Conduent Healthy Communities Institute, 2018). Zip codes are given an Index Value from 0 (low need) to 100 (high need). The greatest percentage of FI patients presented from zip code 19720, SocioNeeds Index ranking (52.4%), lower than Zip codes 19802 (84.3%) and 19805 (80.3%). This is potentially related to size disparities within the catchment area by zip code with 19720 encompassing 37.1 square miles, 19805 5.3 square miles, and 19802 3.2 square miles. Census tract data for these three geographic areas demonstrates single parent family

prevalence ranging from 37.1-94%, and poverty rates for persons under 18 years of age ranging from 8.7% to 15.6%

Table 4.2 shows 94.9% ( $n = 111$ ) reported “Often or Sometimes True” for Q1. For Q2, 76.9% ( $n = 90$ ) reported “Often or Sometimes True”.

Table 4.2 Assessment for Food Insecurity

Question	N	Percent
Q1. “Within the past 12 months we worried whether our food would run out before we got money to buy more.”		
Often True	43	36.75
Sometimes True	68	58.12
Never True	6	5.13
Total	117	100
Q2. “Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.”		
Often True	64	54.7
Sometimes True	26	22.22
Never True	27	23.08
Total	117	100.0

#### 4.1.1 Data on 30 Day Follow Up

While 117 primary caregivers who presented to the ED with the child were screened as positive and received a resource brochure, only 80 were successfully contacted. During telephone calls used to complete the follow-up questionnaire most participants reported feeling safe or very safe ( $n = 76$ , 95%), comfortable or very comfortable ( $n = 70$ , 87.5%), no difficulty in understanding how to apply for benefits ( $n = 72$ , 90.0%), 96.25% ( $n = 77$ ) connected to at least one service, and the follow-up call made a few people ( $n = 3$ , 3.75%) reconsider reaching out to one of the programs



(Table 4.3). A successful connection with one or more local services was reported by 77 families. In using the resource brochure provided, 90% reported having no difficulty applying for benefits and 96.25% indicated that they were able to connect with services.

Table 4.3 Food Insecurity Follow-Up

Question	Frequency	Percent
While in the emergency room, on a scale from 1 to 5 how safe did you feel discussing food issues?		
Very Safe	41	51.2
Safe	35	43.8
Somewhat Safe	4	5.0
Total	80	100.0
How comfortable did you feel talking about FI with your care team?		
Very Comfortable	42	52.5
Comfortable	28	35.0
Somewhat Comfortable	9	11.3
Not Comfortable	1	1.3
Total	80	100.0
Did you have difficulty in understanding how to apply for benefits?		
Yes	8	10
No	72	90
Total	80	100.0
Were you able to connect with any of the services we shared?		
Yes	77	96.25
No	3	3.75
Total	80	100.0

Overall, 77 people (96.25%) successfully connected to one service, while 56 (72.7%) reached out to two or more services. The top three overall services sought by these families included their local food bank (n= 62, 80.5%), Supplemental Nutrition

Assistance Program (SNAP) (n=32, 23.1%) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (n=22, 28.57%).

## **4.2 Results and Conclusions**

As a process change intervention, a brief validated two question screener for FI was integrated as a new standard of care. This screener was administered by ED nurses to primary caregivers of children attending the ED to determine if the family had issues obtaining enough healthy food. Multiple studies indicated the screening tool, The Children's HealthWatch Hunger Vital Sign™ by Hager and colleagues (2010) was validated for use in the ambulatory setting (Barnidge, Labarge, Krupsky, & Arthur, 2017; Baer, Scherer, Fleegler, & Hassan, 2015; Hager et al., 2010; Makelarski, Abramsohn, Benjamin, Du, & Lindau, 2017; Pabalan et al., 2015; Palakshappa, Doupnik et al., 2017). The two-item screener was incorporated in the EHR and ED nurses and providers were educated in its use. In an attempt to reduce screening associated stigma and normalize the screening process, the FI screening was prefaced with a statement emphasizing that questions are asked of all families. On average, FI screening added 30 seconds to the clinical encounter within the ED and there were no staff reports of screening impeding the efficiency of clinical care. The implementation of this simple screening tool was successful with 6,151 families screened for FI during a two-month trial period. The 1.9% of families identified as food insecure during screening were given a resource brochure and then followed to determine their use of resources. In total, 80 families (68.4%) were successfully contacted 30 days after discharge. The majority of families contacted were comfortable being screened for FI. Of the families contacted, 96% used one or more of the brochure resources to improve their access to healthy food. These findings

demonstrate that assessment of social determinants of health can be accomplished in high-volume ambulatory care environments when supported through nursing screening, education and leveraging the EHR to track results.

Lack of caregiver self-disclosure of FI related to fear of stigma may theoretically impact children from reaching their full potential (Knowles et al., 2018). Based on the anticipated volume at the practice site, evidence in the literature predicated the possibility of having 45% of families screen positive for FI. The actual result was only 117, representing only 1.9% of the screened population. Although this practice change has no data to determine the low positive screening result, it is possible that this result may be related to exposure of illegal immigration status and caregiver hesitancy to disclose food hardship due to fear of disclosure to Child Protective Services (Essel, Floyd, & Klein, 2018; Palakshappa, Doupnik et al., 2017; Yang, 2015).

Despite these factors, based on the high annual patient volume in the ED, significant potential remains to impact many children and families. As an annualized comparison in this setting, 1.9% of families (N=117) over two months is potentially equivalent to more than 700 families over one year. Socioeconomic disparities may cause families impacted by transportation issues, access and lack of resources to purchase low quality food stuffs lacking in nutrients. Healthier dietary choices cost more, hence socioeconomic gradients impact dietary choices which is inextricably linked with family distress (Knowles, Rabinowich, De Cuba, Cutts, & Chilton, 2016).

With the resources provided by this project, the majority of these families successfully connected to new services that offer high quality nutritional support such as the Food Bank of Delaware. This demonstrates the significant opportunity for

improving the health trajectory of food insecure families who seek health care for their child in a hospital ED.

### **4.3 Implications for Advanced Nursing Practice**

Screening and referral systems for FI in pediatric primary care settings have been shown to increase families' ability to engage with community-based resources (Garg, Toy, Tripodis, Silverstein, & Freeman, 2015). However, it is crucial to consider that low-income patients utilizing EDs or alternate acute care settings may lack primary care providers (Fishman, McLafferty, & Galanter, 2018). In alignment with the American Academy of Pediatrics (2015), screening for food security should become a priority across all intersections within the healthcare community and Doctor of Nursing Practice advanced practice registered nurses (APRNs) can be the nexus to drive this priority. DNP prepared APRNs are proponents of practice change, patient advocacy and improved patient and community outcomes (Christiansen, & Champion, 2018). DNP's are in a pivotal position to facilitate system change through their knowledge of systems-based approaches, translation of expert clinical knowledge into practice, self-reflection, and the ability to collaborate and drive new practice (Edwards, Coddington, Erler, & Kirkpatrick, 2018).

One clear area for needed change is intervening directly on social factors that undermine health, in this case FI and its bidirectional relationship with well-being. The American Academy of Nursing has been outspoken about the need to assess and address poverty-related issues in early childhood and their far-reaching effects on children's physical and mental health (Lucine, DePriest, Wilson, & Gross, 2018). As Schroeder and Smaldone (2015) opined, FI impacts the potential for healthy living and clinical manifestations of FI include higher rates of hospitalization and detrimental

impacts on overall physical, behavioral and mental health outcomes for children and adolescents.

Nurses at all levels have a moral obligation to support family and societal health and FI is a burgeoning issue that offers nurses an important opportunity for meaningful community engagement. Nursing advocacy, education, care coordination, and clinical care are all avenues that potentially lessen the impact of FI on individuals' physical and mental health. APRNs, as an integral part of the primary and acute healthcare workforce are uniquely qualified to provide innovative solutions to address FI as a basic threat to health for children and adolescents.

Through education, advocacy and policy formation, nurses and APRNs can promote awareness that children who live in poverty are most vulnerable to also live in food insecure homes. APRNs can examine the complex interdependencies between FI and patient outcomes (Berkowitz, Seligman, & Choudhry, 2014). Screening for dietary adequacy can improve identification within the context of social determinants of health impacting access to nutritious food for medically underserved and vulnerable populations. APRNs can ameliorate the effects of FI by driving multi-faceted interventions using the nursing process to recognize individual patient's prioritization of physical, psychosocial, and personal needs, while understanding that those most vulnerable may be the most hesitant to disclose their needs.

#### **4.4 Project Limitations**

One limitation of the project was that despite the implementation of the screening tool and procedures, not all of the families seen in the ER were screened for FI. There was a missed opportunity in that screening was not performed in 26% of children presenting to the ED who met the screening criteria. While these unscreened

families likely refused to participate in screening, the lack of a mechanism within the electronic health to record reasons for non-screening can be deemed a limitation of this project. Information on indications for non-screening would have provided information on improvement opportunities in screening procedures. Additionally, short project time frames are indicative of the need for early nursing stakeholder involvement when introducing new processes and workflows. While De Marchis et al., (2019) demonstrated that social determinant screening is more effective when using paper and tablet computer-based screening tools, this evidence was primarily associated with screening smaller groups. Paper or tablet based FI screening for more than 6,000 patients could not be practically operationalized within the confines of this project.

#### **4.5 Sustainability**

In examining the sustainability of this FI screening and referral practice, there have been no identified impacts on nursing, providers or social workers suggestive of the need for additional staff to support this practice change. Administration and staff have been so supportive of the value of this added screening, that it has been adopted as a permanent admission protocol to the ED. The process has been widely accepted by both nursing and provider staff as an expected standard of care. This FI screening that will continue in the ED has illustrated the feasibility of screening, triaging and providing economical interventions for FI.

The use of the electronic health record to assess, inform and share clinical information about FI in the ED has encouraged exploration of additional screening and tracking methods for social determinants of health in all Nemours ambulatory settings. This work has also informed members of the executive team about the impact of FI on

vulnerable populations and engendered support for screening and intervention as standard clinical care within Nemours Children's Health System.

There is significant enthusiasm around each identified patient and the ability to intervene by offering the resource brochure or consulting social work to potentially impact this important social determinant. Careful preparation, thoughtful assessment and education were important aspects of change acceptance and fostering a team-based approach to FI screening and referral. The most significant costs are directly related to the amount of time that social work may require to intervene on behalf of families that have significant material needs. An hourly estimate of the cost to provide social work support for families with extensive needs was extrapolated as costing between \$27.01-\$41.85 per hour. It is important to note that social work historically supported many families exhibiting similar needs within the ED care setting prior to this project being initiated and remained fully engaged during these efforts. The resource brochure costs equated to less than two cents per copy.

The screening added only a few seconds to the clinical encounter and clinical staff did not report burden related to answering families questions or consulting social work. Continuous improvement feedback on the entire process is elicited using a Plan, Do Check, Act (PDCA) structure for iterative testing of changes to improve quality. An electronic dashboard was created within the electronic health record to track and trend screening results over time to maintain momentum by sharing screening results with the clinical staff during monthly staff meetings.

#### **4.6 Significance of the project to organizational change**

Overall, FI is a national problem that impacts millions of families (Coleman-Jensen, Rabbitt, Gregory, and Singh, 2017). This quality improvement project

confirmed some of the challenges with social determinant screening disclosure rates during face-to-face interviews within the ED. Some families may potentially refuse to acknowledge that they are food insecure due to fear of stigma, child protective service referral or local-level immigration enforcement. This illustrates the importance of further research around caregiver acceptability and comfort with screening for social determinants within the emergency setting. Self-administered screening methods that utilize tablet computers or paper in waiting rooms have been shown to maximize disclosure rates on a wide range of potentially sensitive topics (De Marchis, Torres, Fichtenberg, & Gottlieb, 2019), but may be difficult to implement in high volume, fast paced settings.

The American Academy of Pediatrics (2015) suggests that screening for food security should become a higher priority in ambulatory settings including EDs which serve as social safety nets for vulnerable populations with many unmet material needs (Malecha, Williams, Kunzler, Goldfrank, Alter, & Doran, 2018). At Nemours, stable ED patients are screened for FI upon admission, using the aforementioned screening tool. However, routine screening without associated interventions is unlikely to contribute to positive outcomes for children and families and may cause frustration for healthcare workers and families alike (Garg, Toy, Tripodis, Silverstein, & Freeman, 2015).

Single page handouts detailing available community resources can reduce confusion and help align families with needed services. The plurality of two decades of public policy and research have highlighted the role of the ED in the care of socially disadvantaged populations (Malecha, Williams, Kunzler, Goldfrank, Alter, & Doran, 2018) The pediatric emergency environment may be an optimal intersection to



identify children and families at risk for FI (Malecha, Williams, Kunzler, Goldfrank, Alter, & Doran, 2018; Pabalan et al., 2015).

Implementation of this project improved access to nutritious food for those patients diagnosed as FI. This type of work may contribute to future cost reductions related to hospital overcrowding, patient flow, and non-emergent use of the ED. From a social justice perspective, interventions to improve nutritional status may reduce readmission rates for chronically ill children impacted by poor nutrition, due to improved health status and lead to less overall medical needs.

Overall, the literature reinforced that improved methods of connecting families to local resources may be needed. Statistics demonstrate food assistance gaps for families ineligible for federal nutritional assistance due to net income limit eligibility thresholds which in turn challenges the presumption that current community-based food initiatives are reaching those with the most needs (Palakshappa, Strane, Griffis, Fiks, 2019).

Scant literature has been published about high quality, comprehensive social determinant screening methodologies for fast paced environments like the ED (Pai, Kandasamy, Uleryk, & Maguire, 2016). While the AAP has produced a toolkit to support screening and referral (American Academy of Pediatrics, 2017; Knowles et al., 2018), there is a lack of successful national models to guide healthcare systems on selection of FI screening tools and operationalizing FI screening programs within practice.

There is limited research regarding effective constructs or methods to reduce stigma around social determinant screening. Despite the fact that challenges remain, this project achieved a screening rate of more than 70% and all families screening

positive accessed at least one service, demonstrating that with further refinement this process can be highly effective in identifying families at risk and linking them with the appropriate resources. In the pediatric ED setting a collaborative model including nurses at the bedside and APRN designed interventions can provide an opportunity to reduce one social determinant, FI, among families using the ED.

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## Appendix A

### CHILDREN'S HEALTHWATCH NOTIFICATION EMAIL CORRESPONDENCE

RE: Children's HealthWatch Hunger Vital Sign  Inbox x



 **Sheward, Richard** <Richard.Sheward@bmc.org>  
to me, Ettinger 

Apr 24   

Hi Keith,

Thanks for your email. We do not require any permission for use of the Hunger Vital Sign/ It is a tool freely available to the public, and we are happy to provide you any guidance or clarification on its use should you have nay questions along the way. Our website (<http://childrenshealthwatch.org/public-policy/hunger-vital-sign/>) has some very useful information as well. We only ask that you cite our validation study ([http://www.childrenshealthwatch.org/wp-content/uploads/EH\\_Pediatrics\\_2010.pdf](http://www.childrenshealthwatch.org/wp-content/uploads/EH_Pediatrics_2010.pdf)) when referencing the tool.

Best,

Rich

--

Richard **Sheward**, MPP  
Deputy Director of Innovative Partnerships  
[Children's HealthWatch](#)  
Phone: 518-265-5343

**From:** Keith Fishlock [<mailto:kfishlock@gmail.com>]  
**Sent:** Monday, April 23, 2018 4:51 PM  
**To:** Ettinger De Cuba, Stephanie A  
**Subject:** Children's Health watch Vital Sign

Greetings,

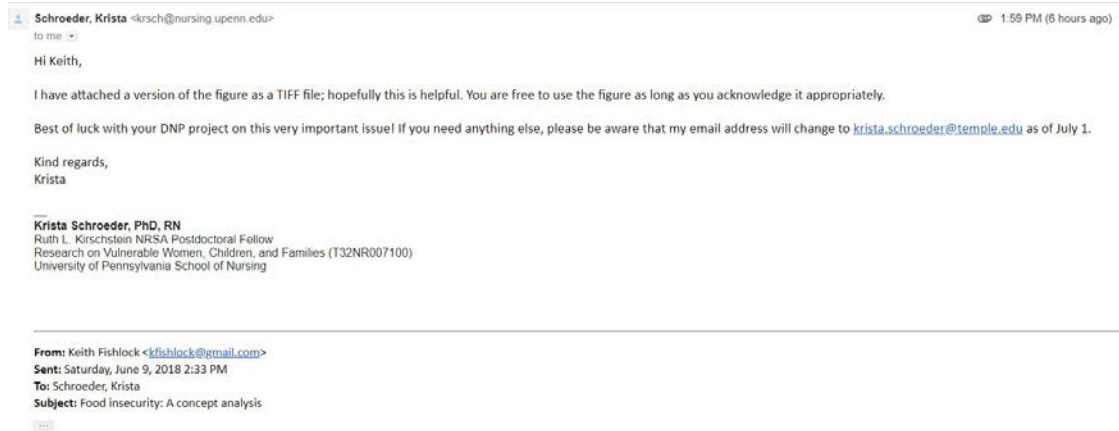
I was wondering how one obtains written permission if necessary to utilize the Children's HealthWatch Vital Sign? It is a component of screening I am integrating into a food insecurity doctoral project.

Regards,

Keith Fishlock DNP student  
University of Delaware

## Appendix B

### KRISTA SCHROEDER, PHD, RN NOTIFICATION EMAIL CORRESPONDENCE



## Appendix C

### LITERATURE REVIEW TABLES

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results/ Limitations	Implications for practice, research, theory
Peltz, A., Samuels-Kalow, M. E., Rodean, J., Hall, M., Alpern, E. R., Aronson, P. L., ... & Cohen, E. (2017). Characteristics of children enrolled in Medicaid with high-frequency emergency department use. Pediatrics, e20170962.	Describe the characteristics of children who sustain frequent ED use over 1-3 years	II/A	n= 470,449	Retrospective longitudinal cohort study	MarketScan Medicaid Database	Risk factors for recurrent ED use by children include younger age, black or Hispanic race or ethnicity, and public health insurance.  Adolescents and individuals with multiple chronic conditions were most likely to have sustained high rates of ED use.	1 in 6 Medicaid- insured children with high ED use in a single year experienced sustained high levels of ED use over the next 2 years. Targeted interventions may be indicated to help reduce ED use among children at high risk

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results Limitations	Implications for practice, research, theory
Montalbano, A., Rodean, J., Kangas, J., Lee, B., & Hall, M. (2016). Urgent care and emergency department visits in the pediatric Medicaid population. Pediatrics, 2015.	Compared clinical and cost factors pediatric urgent care and emergency department visits without admission	III/E	n=5,925,568	Retrospective, observational study	MarketScan Medicaid Database	Hispanic population use almost twice that of those seeking care in the ED. Limited to reporting the epidemiology and comparisons between 2 sites. Also, little research in the area of pediatric urgent care, previous research limited.	Almost half the ED visits were low severity. Children make up the largest percentage of Medicaid usage.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results Limitations	Implications for practice, research, theory
Marshall, S., Burrows, T., & Collins, C. E. (2014). Systematic review of diet quality indices and their associations with health-related outcomes in children and adolescents. <i>Journal of human nutrition and dietetics</i> , 27(6), 577-598.	Describe associations between diet quality indices and health-related variables in pediatric populations	I/B	n=119 studies	Systematic review	Quantitative measure of diet quality indices	Pediatric diet quality indices were found to be associated with environmental, behavioral and maternal factors. Low diet quality was also found to be associated with an increased likelihood of behavioral and emotional symptoms in children, diet quality was a predictor of academic performance and intelligence	prospective cohort, intervention and validation studies are required to draw stronger conclusions concerning risk of future disease in pediatric populations in general.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results/ Limitations	Implications for practice, research, theory
Burke, M. P., Martini, L. H., Cayir, E., Hartline-Grafton, H. L., & Meade, R. L. (2016). Severity of Household Food Insecurity Is Positively Associated with Mental Disorders among Children and Adolescents in the United States-. <i>The Journal of nutrition</i> , 146(10), 2019-2026.	Association between severity of household food insecurity and mental disorders among children	III/A	n= 16,918 children and 14,143 adolescents	Retrospective cohort study	Measures of mental disorders and food security status  National Health Interview Survey. Brief Strengths and Difficulties Questionnaire (SDQ) and the 10-item USDA Household Food Security Survey	Severity of household food insecurity is positively associated with mental disorders among both children and adolescents in the United States.  Significant linear trend in ORs, as severity of household food insecurity increased so did the odds of youth having a mental disorder (P < 0.001).  Youth in marginally food-secure households had higher odds of having a mental disorder with impairment [child OR: 1.26 (95% CI:	Results suggestive improving household food security status has the potential to reduce mental disorders among US youth

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results/ Limitations	Implications for practice, research, theory
Kimbro, R. T., & Denney, J. T. (2015). Transitions into food insecurity associated with behavioral problems and worse overall health among children. <i>Health Affairs</i> , 34(11), 1949-1955.	Identify impacts of food insecurity on academic achievement and behavior	III/B	n= 6,300 children	Systematic review	2010–12 for Early Childhood Longitudinal Study, Kindergarten Class of 2010–11, with household incomes below 300 percent of the federal poverty level	consistent associations between transitions into food insecurity and child behavioral outcomes, including interpersonal skills, self-control, and externalizing behaviors. Parent-reported child health status was worse for both children who were persistently food insecure and those who transitioned into food insecurity	consistent negative impacts of children's externalizing behaviors, self-control, and interpersonal skills and on parents' reports of children's overall health status

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Lam, L. F., & Lawlis, T. R. (2017). Feeding the brain – The effects of micronutrient interventions on cognitive performance among school-aged children: A systematic review of randomized controlled trials. <i>Clinical Nutrition</i> , 36(4), 1007-1014. doi:10.1016/j.clnu.2016.06.013	Study effect of micronutrient interventions on different cognitive domains of children	I/A	n=19 RCT's	Systematic review	Fluid intelligence, crystallized intelligence, short-term memory, long-term memory, cognitive processing speed, attention and concentration, and school performance	Children and adolescents at risk of micronutrient deficiency are particularly vulnerable to declined cognitive development and function which influences their later adult life.	Various cognitive test tools were used across trials, therefore classification of the tests into corresponding domain and valid comparisons are difficult.	Micronutrient deficiency limits school-aged children from achieving their optimal cognitive and intellectual abilities.



Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Liu, J., & Raine, A. (2016). Nutritional status and social behavior in preschool children: the mediating effects of neurocognitive functioning. <i>Maternal &amp; Child Nutrition</i> , 13(2), 1-15. doi:10.1111/mcn.12321	Tests the hypothesis that poor nutritional status is associated with impaired social functioning in childhood, and that neurocognitive ability mediates this relationship.	III/A	n=1795	Retrospective birth cohort	Four early indicators of malnutrition	Suggests that the effect of poor nutrition on the child's positive social behavior has much broader implications for the child's later well-being than previously suspected.	Findings restricted to childhood, and did not assess long-term effects of malnutrition on social-behavioral outcomes. Social behavior raters might not have been completely blinded	Promoting good nutrition, may help promote positive social behavior in early childhood during a critical period for social and neurocognitive development, with implications for improving positive health in adulthood.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Shankar, P., Chung, R., & Frank, D. A. (2017). Association of food insecurity with children's behavioral, emotional, and academic outcomes: A systematic review. <i>Journal of Developmental &amp; Behavioral Pediatrics</i> , 38(2), 135-150.	Examine the association between FI and childhood developmental and behavioral outcomes	III/B	N=23	Systematic review	Multiple including USDA 18 item food security scale, multiple derivatives of same. C-CHIP scale, idiosyncratic food insecurity measures	Household FI, even at marginal levels, associated with children's behavioral, academic, emotional problems from infancy to adolescence after controlling for confounders. bivariate relationship in and concurrent and future negative developmental and behavioral outcomes	Nonstandard versions of the USDA 18-item Food Security scale were used in some studies. Some studies on FI are not nationally representative and may not be generalizable to a larger population	Evidence should encourage health providers to screen for food insecurity and intervene when possible. Children whose families are identified as food insecure warrant enhanced developmental behavioral assessment and possible intervention.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Knowles, M., Rabinowich, J., De Cuba, S. E., Cutts, D. B., & Chilton, M. (2016). "Do you wanna breathe or eat?": parent perspectives on child health consequences of food insecurity, trade-offs, and toxic stress. Maternal and Child Health Journal, 20(1), 25-32.	Investigate how public assistance programs and economic hardships, including food insecurity, affect the well-being of young children and their caregivers	III/E	n= 51 parents of young children under age four	Qualitative	coded "meaning units" in each manuscript and organized them by themes in ATLAS.ti.  Three primary areas of concern: trade-offs, mental health, and child well-being.	Food insecurity, creates a cluster of hardships corresponding to toxic stress for children and adults.  Behavioral health support could help alleviate hardship stress and anxiety	Not discussed	Results suggest the need for public assistance programs to integrate behavioral health and comprehensive 2-generation approaches.  Food insecurity associated trade-offs and mental health consequences,  Encourage clinicians/early childhood educators to screen for hardship

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Zaslow, M., Bronte-Tinkew, J., Capps, R., Horowitz, A., Moore, K. A., & Weinstein, D. (2008). Food security during infancy: Implications for attachment and mental proficiency in toddlerhood. Maternal and Child Health Journal, 13(1), 66-80. doi:10.1007/s10995-008-0329-1	Examined associations between household food security during infancy and attachment and mental proficiency in toddlerhood	III/A	n = 7,894	Retrospective Early Childhood Longitudinal Study-Birth Cohort (ECLS-B)		Food security affects children's development early, implications for overall health and overweight of toddlers. Greater food insecurity predicted insecure child attachment and less advanced mental proficiency at 24 months	Relied on single measures for each domain of child development rather than multiple  Measure of child attachment security is not the "gold standard" for assessing this outcome  Newer measures available	Food insecurity worked indirectly through depression and parenting practices to influence security of attachment and mental proficiency in toddlerhood.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Cook, J. T., & Frank, D. A. (2008). Food security, poverty, and human development in the United States. <i>Annals of the New York Academy of Sciences</i> , 1136(1), 193-209.	Household and children's food insecurity and its relationship with children's health and development and with mothers' depressive symptoms					Food insecurity is risk to the growth, health, cognitive, and behavioral potential of children. Infants and toddlers in particular are at risk from food insecurity even at the lowest levels of severity.		Diets higher in fat, sugars, starches, and salt Lower quality of health, iron deficiency, and an increased possibility of children aged 1-5 experiencing chronic illness. Lower academic achievement and increased absences from school

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Makelarski, J. A., Abramsohn, E., Benjamin, J. H., Du, S., & Lindau, S. T. (2017). Diagnostic accuracy of two food insecurity screeners recommended for use in health care settings. <i>American journal of public health</i> , 107(11), 1812-1817.	Diagnostic accuracy of the American Academy of Pediatrics (AAP) recommended food insecurity screener	II/B	n=188	Prospective diagnostic accuracy studies	Household Food Security Survey HFSS 18 item screener versus AAP screener versus Two-item Hunger VitalSign™	The Hunger Vital Sign sensitivity was significantly higher than the American Academy of Pediatrics tool (12-month: 94% [95% CI = 86%, 98%; P = .002]; 30-day: 92% [95% CI = 79%, 98%; P = .02]).	Convenience sample of adults at 1 health care organization	AAP tool missed nearly 25% food-insecure adults screened in the hospital; HVS screening tool more sensitive. Caregivers of children may be reluctant to self-identify as food insecure because of fear of negative consequences

Author/title	Purpose	Appraisal	Sample/ Design	Results	Limitations	Implications for practice, research, theory
Barnidge, E., Labarge, G., Krupsky, K., & Arthur, J. (2017). Screening for food insecurity in pediatric clinical settings: Opportunities and barriers. <i>Journal of Community Health</i> , 42(1), 51-57. doi:10.1007/s10900-016-0229-z	Assessment of demographics, household food security status, participation in nutrition assistance programs, and barriers to getting enough food to eat.	II/A	n= (212 caregivers, 67 physicians);  Cross-sectional survey design	66% would feel comfortable talking with health care provider about food needs. 19% expressed discomfort and those who screened positive for FI more likely to report discomfort with screening than those who did not [OR 2.72 (95% CI 1.20-6.15) if talking with clinician; OR 3.99 (95% CI 1.65-9.61) if talking with nurse]	Data was collected from a convenience sample of caregivers during July  Caregivers with infants were excluded from our assessment due to a co-occurring study	2 item validated screening tool successfully identified FI. Success for screening in pediatric settings relies heavily on caregiver participation and comfort.  Food insecurity screening in pediatric clinical visits is an important step in identifying children at-risk of food insecurity.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Pabalan, L., Dunn, R., Gregori, K., Olson, E., Thomas, L., Willis, E., ... & Brousseau, D. C. (2015). Assessment of food insecurity in Children's Hospital of Wisconsin's emergency department. <i>WMJ</i> , 114(4), 148-151.)	Determine the prevalence of FI in an urban pediatric emergency department in Milwaukee, Wisconsin	III/B	n=309;	Cross-sectional survey design, descriptive study	8 item demographic screener, Two-item Hunger VitalSign™	2 item validated screening tool successfully identified FI. Nearly half of families presenting with children to a pediatric ED reported food insecurity. Emergency department screening may increase resources available for FI caregivers.	Exclusion of non-English speaking families. Certain diagnoses were excluded	Nearly half of families screened were positive for FI.  Demonstrates the potential benefit of implementing a formal screening process for FI in the ED as it may be the only point of medical contact for some families.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Baer, T. E., Scherer, E., Fleegler, E., & Hassan, A. (2015). Effectiveness of a 2-item screening tool for detecting food insecurity in an urban adolescent and young adult population. Journal of Adolescent Health,56(2), S48-S49.	Studies of acceptability and screening outcomes for urban youth clinic patient's	III/B	n=400;	Case control study	The Online Advocate, which included the Two- item Hunger VitalSign™	2-item food insecurity screen was an effective quick screening tool. One- third of youth in sample experienced food insecurity.  The 2-item food insecurity screen demonstrated sensitivity of 88.5%, specificity of 84.1%,	Isolated to a single center, results may not be generalizable	The embedded 2-item Hunger Vital Sign was validated against the 18-item USDA FSS “gold standard”

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Palakshappa, D., Vasan, A., Khan, S., Seifu, L., Feudtner, C...Fiks, A. G. (2017). Clinicians’ perceptions of screening for food insecurity in suburban pediatric practice. Pediatrics, 140(1),1-7.	Evaluated feasibility, acceptability, and impact of screening in suburban practices.	V/A	n=5645	Mixed methods study	Focus groups with clinicians to determine perceptions of screening and suggestions for improvement.	2 item validated screening tool successfully identified FI. Time and workflow not barriers to screening. Achievable and suitable for clinicians to screen for FI in pediatric practice environments. Improved methods of connecting families to local services may be needed.	All practices located in the suburbs of the same metropolitan area and part of the same primary care network, which might limit the generalizability	Feasible acceptable clinicians to screen for FI in practices, but referral method (3 <sup>rd</sup> party phone method) used in study was ineffective in assisting families in obtaining benefits.  Questions included in the EHR template.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Fox, C. K., Cairns, N., Sunni, M., Turnberg, G. L., & Gross, A. C. (2016). Addressing food insecurity in a pediatric weight management clinic: a pilot intervention. Journal of Pediatric Health Care, 30(5), e11- e15.	Identify rates of FI in a pediatric weight management clinic and test a pilot intervention to address food insecurity in the identified patients.	II/B	n=116	Cohort study	Two-item Hunger VitalSign™	Significantly more food- insecure patients received public health insurance and enrolled in SNAP. Food insecurity among patients common, 25% of families eligible for services declined.	Not discussed	Demonstrated feasibility of a clinic–food bank partnership to address food insecurity.  Pilot clinical intervention resulted in a low rate of matriculation into SNAP program.  Examining support for onsite SNAP matriculation may be of value.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Garg, A., Toy, S., Tripodis, Y., Silverstein, M., & Freeman, E. (2015). Addressing social determinants of health at well child care visits: A Cluster RCT. Pediatrics, 135(2), e296-302.	Evaluate the effect of a clinic- based screening and referral system	I/A	n=336	Cluster RCT	Children's HealthWatch survey 18- item US Food Security Scale  Self-report screening instrument	Improved access to basic needs. Intervention group mothers had significantly greater adjusted odds of receiving a referral. 12- month well child care visit, more intervention group mothers had enrolled in ≥1 new resource.	All practices located in the suburbs of the same metropolitan area and part of the same primary care network, which might limit the generalizability	Systematically screening and referring for social determinants during well child care can lead to the receipt of more community resources for families

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Lane, W., Dubowitz, H., Feigelman, S., & Poole, G. (2014). The effectiveness of food insecurity screening in pediatric primary care. International Journal of Child Health and Nutrition, 3(3), 130- 138.	Evaluate validity and stability of single item (FI) screen.  Assess whether use may lead to decreased FI.	I/A	n=558	RCT	Single item screening tool  USDA Food Security Scale	Standard protocol increased screening rate and connection to services. Screening lead to positive outcomes including increased referral to services and continued enrollment.	Part of the same primary care network, which might limit the generalizability	A single question screen can identify many families with FI,  Screening alone not adequate to alleviate FI.
Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Palakshappa, D., Doupnik, S., Vasan, A., Khan, S., Seifu, L., Feudtner, C., & Fiks, A. G. (2017). Suburban families' experience with food insecurity screening in primary care practices. Pediatrics, 140(1), e20170320.	Sought parents' perceptions of screening for FI, how FI impacted the family, and how practices could more effectively address FI.	III/B	n=23	Qualitative analysis of semi- structured interviews of provider perspectives	Two-item Hunger VitalSign™	Parents suggested clinician practices could be most helpful by providing information about where to apply for benefits and what documentation to bring, as well as a list of locations and transportation routes for food pantries.	External validity limited by sample and lack of parents with limited English proficiency.  All caregivers were identified in the suburbs of 1 major metropolitan area.	In-person screening by nurse practitioner or provider during diet history.  Questions included in the EHR template.



Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Hoisington, A. T., Braverman, M. T., Hargunani, D. E., Adams, E. J., & Alto, C. L. (2012). Health care providers' attention to food insecurity in households with children. Preventive medicine, 55(3), 219-222.	Determine extent to which providers monitor (FI) of families with children, and examine factors influencing FI monitoring.	III/B	n=186	Mixed methods study	Two items that asked how often the provider asks patients or caregivers about "having adequate nutritious/high quality foods in the house so that everyone is properly nourished" and "having food in the house so that everyone has enough to eat"	a general lack of knowledge about food insecurity and resources, discomfort discussing with families, lack of resources and inadequate time to address during the medical visit	Low response rate leaves open the possibility of nonresponse bias in the results.	89% of providers were willing to screen for FI if they had an available standardized question.  Routine monitoring of patients' household FI by health care providers is an underutilized strategy for reducing this condition
Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Colvin, J. D., Bettenhausen, J. L., Anderson-Carpenter, K. D., Collie-Akers, V., & Chung, P. J. (2016). Caregiver opinion of in-hospital screening for unmet social needs by pediatric residents. Academic Pediatrics, 16(2), 161-167.	Examine caregivers' opinions about providers role in addressing social need	III/B	n=619	Descriptive case control study	Three item survey instrument	Teaching and reinforcement strategies effectively increased resident screening and detection for social needs.	Enrolled study population drawn from general pediatrics may not be generalizable to all in-hospital families  Unable to enroll non-English-speaking parents	Caregivers have favorable opinions of providers role in addressing the social determinants health.  Providers should be confident in acceptability of screening families for social needs in both the well child and acute settings.



Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Gottlieb, L., Hessler, D., Long, D., Amaya, A., & Adler, N. (2014). A randomized trial on screening for social determinants of health: the iScreen study. Pediatrics, 134(6), e1611- e1618.	Compare Social determinant disclosure in electronic versus face-to-face screening modalities in an urban pediatric emergency department.	I/A	538 caregivers of patients < 18 years  (n = 285 electronic and n = 253 in face-to- face arm)	Randomized controlled trial	Single-Item Hunger Screening Tool	Reporting on sensitive issues was a significant difference in the proportion of social needs items with higher endorsement in the computer- based group (70%) than the face-to- face group (30%).	No crossover design verifying if participants would report same in both formats	Pediatric clinical sites screening for social determinants should consider electronic screening when feasible,
Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Knowles, M., Khan, S., Palakshappa, D., Cahill, R., Kruger, E., Poserina, B. G., ... & Chilton, M. (2018). Successes, Challenges, and Considerations for Integrating Referral into Food Insecurity Screening in Pediatric Settings. Journal of health care for the poor and underserved, 29(1), 181- 191.	Evaluated the efficacy of screening and referral through process evaluation	III/B	n=7,284	Mixed Methods	Two-item Hunger VitalSign™	Among 1,584 caregivers screened via paper survey, 45.5% reported food insecurity, whereas among the 5,700 caregivers screened by physicians through the EMR, 7.2% reported food insecurity Several physicians and social workers described difficulty understanding the referral process	Limited in its generalizability by the localized implementation. The research team unable to include parents who could not be reached for follow-up	During screening and referral, parents reported staff who addressed their concerns about confidentiality and potential child welfare involvement were helpful.  Just over half of food- insecure caregivers (630, 55.6%) could be reached after three phone calls

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Adams, E., Hargunani, D., Hoffmann, L., Blaschke, G., Helm, J., & Koehler, A. (2017). Screening for Food Insecurity in Pediatric Primary Care: A Clinic's Positive Implementation Experiences. Journal of health care for the poor and underserved, 28(1), 24-29.	Case study of a FI screening implementation effort in an academic pediatric primary clinic	III/B	n=not provided	Qualitative, case study	Two-item Hunger VitalSign™	Providers documented FI status in clinical notes, but not on the patient's problem list. "Food insecurity" not available as an ICD code. Must use Lack of Adequate Food.	Not discussed	Implemented systematic screening and intervention to identify and address FI in an academic general pediatric practice.  Clinicians preferred a single page family resource

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Bottino, C. J., Rhodes, E. T., Kreatsoulas, C., Cox, J. E., & Fleegler, E. W. (2017). Food Insecurity Screening in Pediatric Primary Care: Can Offering Referrals Help Identify Families in Need?. Academic pediatrics, 17(5), 497- 503.	Evaluation of clinical approach for food insecurity screening incorporating a menu offering food- assistance referrals, and an examination of relationships between FI and referral selection.	III/B	n=340 caregivers in a pediatric hospital- based primary care clinic	Cross sectional study	US Household Food Security Survey Module: 6- Item Short Form (food insecurity screen)  The Online Advocate (TOA) self- administered assessment and referral tool for health- related social problems	screening rate was 92.5% (430/463 patients), 74.0% (318/430) were food insecure  Offering referrals may be a helpful adjunct to standard screening for eliciting family preferences and identifying unmet social needs.	Only English- speaking caregivers from a single pediatric clinic and therefore cannot comment on overall generalizability.	Incomplete overlap between FI and referral selection.  Supporting evidence for eliciting family preferences when evaluating social needs in pediatric primary care.

Author/title	Purpose	Appraisal	Sample	Design	Variables/ instruments	Results	Limitations	Implications for practice, research, theory
Smith, S., Malinak, D., Chang, J., Perez, M., Perez, S., Settlekowski, E., ... & Aedo, S. (2017). Implementation of a food insecurity screening and referral program in student-run free clinics in San Diego, California. Preventive medicine reports, 5, 134- 139.	Implement a food insecurity screening and referral program in Student- run Free Clinics and document prevalence of food insecurity screening.	III/B	n=463	Cross sectional study	6-item USDA US Household Food Security Survey	screening rate was 92.5% (430/463 patients), 74.0% (318/430) were food insecure	Patient- administered surveys relied on self-report to assess FI. May be impacted by recall-bias, education- level, literacy barriers, influenced by shame, or preference not to discuss with a health care provider.	Data suggests that FI is likely quite prevalent in underserved settings.  Highlights importance of screening for FI particularly likely under- recognized, under- diagnosed, and under- treated.

## Appendix D

### (JHNEBP) MODEL NOTIFICATION EMAIL CORRESPONDENCE



## Appendix E

### JOHNS HOPKINS NURSING EVIDENCE-BASED PRACTICE (JHNEBP) MODEL

STRENGTH of the Evidence	
<b>Level I</b>	Experimental study/randomized controlled trial (RCT) or meta analysis of RCT
<b>Level II</b>	Quasi-experimental study
<b>Level III</b>	Non-experimental study, qualitative study, or meta-synthesis.
<b>Level IV</b>	Opinion of nationally recognized experts based on research evidence or expert consensus panel (systematic review, clinical practice guidelines)
<b>Level V</b>	Opinion of individual expert based on non-research evidence. (Includes case studies; literature review; organizational experience e.g., quality improvement and financial data; clinical expertise, or personal experience)

QUALITY of the Evidence		
<b>A High</b>	Research	consistent results with sufficient sample size, adequate control, and definitive conclusions; consistent recommendations based on extensive literature review that includes thoughtful reference to scientific evidence.
	Summative reviews	well-defined, reproducible search strategies; consistent results with sufficient numbers of well defined studies; criteria-based evaluation of overall scientific strength and quality of included studies; definitive conclusions.
	Organizational	well-defined methods using a rigorous approach; consistent results with sufficient sample size; use of reliable <b>and</b> valid measures
	Expert Opinion	expertise is clearly evident
<b>B Good</b>	Research	reasonably consistent results, sufficient sample size, some control, with fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence
	Summative reviews	reasonably thorough and appropriate search; reasonably consistent results with sufficient numbers of well defined studies; evaluation of strengths and limitations of included studies; fairly definitive conclusions.
	Organizational	Well-defined methods; reasonably consistent results with sufficient numbers; use of <b>reliable and valid</b> measures; reasonably consistent recommendations
	Expert Opinion	expertise appears to be credible.
<b>C Low quality or major flaws</b>	Research	little evidence with inconsistent results, insufficient sample size, conclusions cannot be drawn
	Summative reviews	undefined, poorly defined, or limited search strategies; insufficient evidence with inconsistent results; conclusions cannot be drawn
	Organizational	Undefined, <b>or</b> poorly defined methods; insufficient sample size; inconsistent results; undefined, poorly defined or measures that lack adequate reliability or validity
	Expert Opinion	expertise is not discernable or is dubious.

*\*A study rated an A would be of high quality, whereas, a study rated a C would have major flaws that raise serious questions about the believability of the findings and should be automatically eliminated from consideration.*

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Newhouse, R., Dearholt, S., Poe, S., Pugh, LC., White, K. (2005). The Johns Hopkins Nursing Evidence-based Practice Rating Scale. Baltimore, MD, The Johns Hopkins Hospital; Johns Hopkins University School of Nursing.

## Appendix F

### IRB APPROVALS NEMOURS/UNIVERSITY OF DELAWARE



**Nemours Office of Human Subjects Protection**  
Nemours/Alfred I. duPont Hospital for Children  
1600 Rockland Road  
Wilmington, DE 19803  
Fax: 302-651-4683  
Office: 302-298-7613

DATE: July 16, 2018  
TO: Keith Fishlock, MSN  
FROM: Nemours IRB 1  
STUDY TITLE: [1285429-2] Food Insecurity as A Pediatric Health Concern  
IRB #: 1285429  
SUBMISSION TYPE: Other  
ACTION: NOT RESEARCH  
REVIEW DATE: July 16, 2018

Thank you for your submission of Other materials for this project. Nemours IRB 1 has determined this project does not meet the definition of human subject research under the purview of the IRB according to federal regulations.

Please note that any project modifications that may alter this non-human subject research determination must be submitted to the IRB for review.

Reviewed documents in this submission:

- Application Form - Application - REQUEST for Research Determination v01-16 (1).docx (UPDATED: 07/12/2018)
- Protocol - University of Delaware Protocol Food Insecurity Fishlock.doc (UPDATED: 07/12/2018)

If you have any questions, please contact Laurel Jones at Al duPont Hospital for Children 1600 Rockland Road, ARB Room 162-D, Wilmington, Delaware 19803 at (302) 651-6807 or [Laurel.Jones@nemours.org](mailto:Laurel.Jones@nemours.org). Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 Halliham Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: July 16, 2018  
TO: Keith Fishlock, MSN  
FROM: University of Delaware IRB  
STUDY TITLE: [1285429-1] Food Insecurity as A Pediatric Health Concern  
SUBMISSION TYPE: New Project  
ACTION: DETERMINATION OF NOT RESEARCH  
DECISION DATE: July 16, 2018

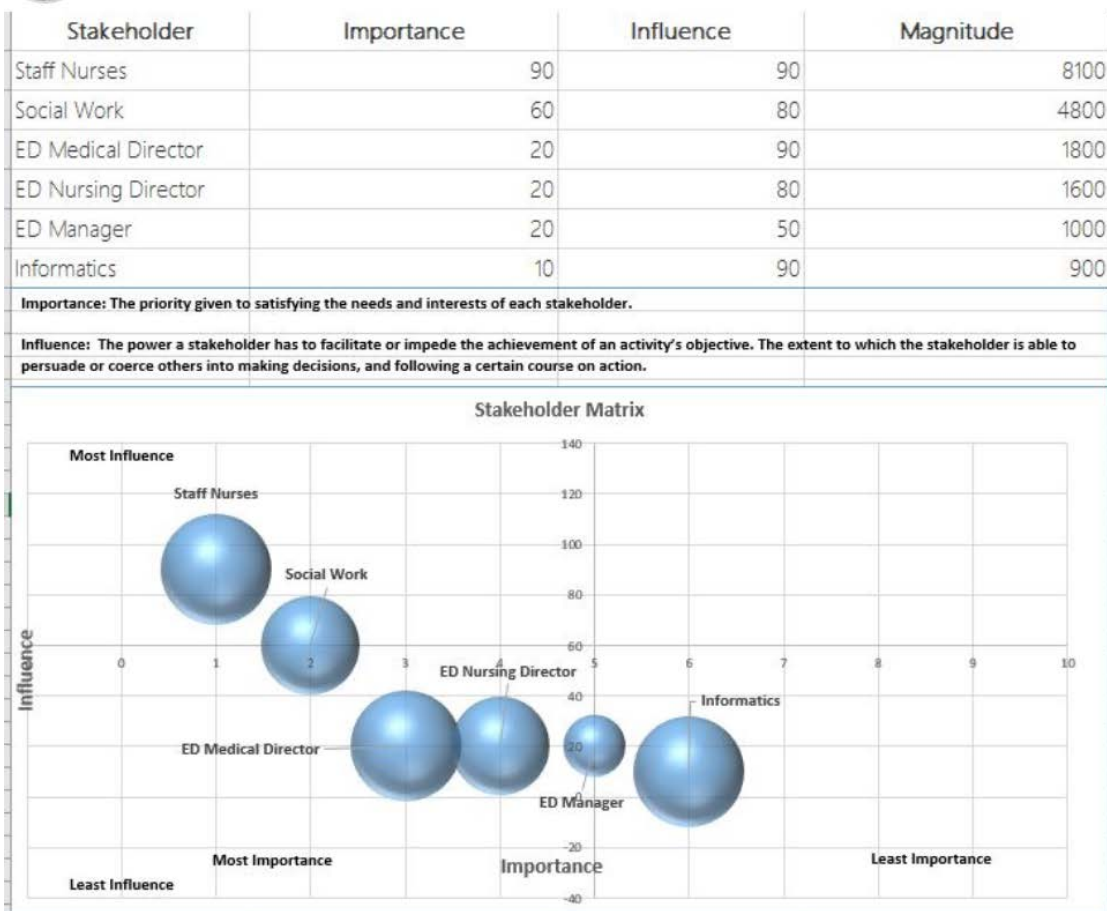
Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project does not meet the definition of human subject research under the purview of the IRB according to federal regulations.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact Nicole Famese-McFarlane at (302) 831-1119 or [nicolemf@udel.edu](mailto:nicolemf@udel.edu). Please include your study title and reference number in all correspondence with this office.

## Appendix G

### STAKEHOLDER PRIORITY MATRIX





## Appendix H

### FOOD RESOURCES BROCHURE



**Do you need help feeding your family?**

Food is an important part of your child's health. There are many programs to help people get food. We want you to know what help is available.

The following are free and confidential services to help find local resources. The state-based **211** programs are available 24 hours a day, 7 days a week in 180 different languages.

Programs include: education about eating healthy on a budget, local access to fresh food and vegetables, meal assistance services for your family, formula/baby food/breastfeeding support and help with applying for benefits.

#### State- and County-Based Resources

State	Phone	Text	Email	Food Bank (County)
Delaware	2-1-1 or (800) 560-3372	(302) 231-1464	info@delaware211.org	(302) 292-1305 (New Castle) (302) 424-3301 (Kent, Sussex)
Maryland	2-1-1 or (800) 492-0618	(410) 685-0525	info@211MD.org	(410) 996-0100 (Cecil)
New Jersey	2-1-1 or (877) 652-1148	898-211	info@NJ211.org	(856) 935-0305 (Salem, Gloucester) (856) 299-1296 (Camden)
Pennsylvania	2-1-1 or (866) 964-7922	898-211	info@211sepa.org	(215) 339-0900 (Delaware, Philadelphia, Montgomery)

#### Other Food Assistance

Program	Description	Website	Phone	For Help With Your Application
National Hunger Hotline	Local food pantries	hungerfreeamerica.org	(866) 348-6479 (877) 8-HAMBRE	Delaware Assist (302) 255-9500
School breakfast and lunch programs for children	Free or reduced price healthy meals for income-eligible students of all ages.	fns.usda.gov/school-meals/school-meals-contacts	(866) 348-6479	NJ Department of Human Services (800) 687-9512
Summer Food Service Program (SFSP)	Free healthy meals during the summer for students 18 and under.	fns.usda.gov/sfsp	(866) 348-6479	
Supplemental Nutrition Assistance Program (SNAP)	Money to purchase food. The average benefit is about \$127 per month per person.	fns.usda.gov/snap	(800) 221-5689	MD Benefits Center (555) 444-4998
WIC (Women, Infants and Children Program)	Money to purchase foods for pregnant/postpartum women, infants, and children under the age of 5. Nutrition education and breastfeeding support also provided.	fns.usda.gov/wic	(866) 348-6479	PA Benefits Center (555) 486-9331

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**Nemours.** Alfred I. duPont  
Hospital for Children



## Appendix I

### SCREENING FOLLOW UP CALLS BY WEEK

Screening Weeks 1-8 Phone Follow-up Weeks 5-12	Total during timeframe	Week 1 9/11-9/18	Week 2 9/18-9/25	Week 3 9/25-10/2	Week 4 10/2-10/9	Week 5 10/9-10/16	Week 6 10/16-10/23	Week 7 10/23-10/30	Week 8 10/30-11/06	Week 9 11/06-11/13	Week 10 11/13-11/20	Week 11 11/20-11/27	Week 12 11/27-12/4
Total visits to the ED	9543	1190	1145	1118	1184	1273	1234	1222	1177	*While no data was collected for DNP Project during this time, screening continued as a sustained standard of care			
Eligible to be screened (levels 3,4,5) Intent to screen	N=8292	1023	1004	961	1046	1069	1101	1064	1024				
Completed screened (levels 3,4,5)	n=6151	644	703	713	793	770	834	846	848				
Positive FI Result	117	3	8	14	17	15	18	23	19				
Phone calls attempted (Max 3 calls)	351	X	X	X	X	9	24	42	51	45	54	69	57
Phone calls completed	80	X	X	X	X	2	6	12	13	8	13	12	14

## Appendix J

### CHILDREN'S HEALTHWATCH HUNGER VITAL SIGN

#### What is the Hunger Vital Sign™?

In 2010, Drs. Erin Hager and Anna Quigg and the Children's HealthWatch team developed the Hunger Vital Sign™, a 2-question screening tool based on the US Household Food Security Scale to identify young children in households at risk of food insecurity.

The logo for Hunger VitalSign™ is displayed within a dark red rectangular box. The text "Hunger VitalSign™" is written in a white, sans-serif font.

The Hunger Vital Sign™ identifies individuals and families as being at risk for food insecurity if they answer that either or both of the following two statements is 'often true' or 'sometimes true' (vs. 'never true'):

“ Within the past 12 months we worried whether our food would run out before we got money to buy more.”

“ Within the past 12 months the food we bought just didn't last and we didn't have money to get more.”

## Appendix K

### FOOD INSECURITY FOLLOW-UP QUESTIONNAIRE

[1285429] FI as A Pediatric Health Concern

*Script: Hi, my name is Keith and I am calling from Nemours ED. When you were in the ED, we asked some questions about food. I wanted to ask you five questions about your experience if you have the time.*

1. While in the emergency room, on a scale from 1 to 5 how safe did you feel discussing food issues?

<b>1 Very safe</b>	2 Safe	3 Somewhat safe	4 Not safe	<b>5 Very unsafe</b>
--------------------	--------	-----------------	------------	----------------------

2. While in the emergency room, on a scale from 1 to 5 how comfortable did you feel talking about FI with your care team?

<b>1 Very comfortable</b>	2 Comfortable	3 Somewhat comfortable	4 Not comfortable	<b>5 Very uncomfortable</b>
---------------------------	---------------	------------------------	-------------------	-----------------------------

3. Did you understand how to apply for benefits?

<b>1. YES</b>	<b>2. NO</b>
---------------	--------------

4. Were you able to connect with any of the services we shared?


a.	Snap	<b>YES</b>	<b>NO</b>
b.	WIC	<b>YES</b>	<b>NO</b>
c.	National Hunger Helpline	<b>YES</b>	<b>NO</b>
d.	School breakfast/lunch program	<b>YES</b>	<b>NO</b>
e.	Summer meals for children	<b>YES</b>	<b>NO</b>
f.	Local food bank	<b>YES</b>	<b>NO</b>

5. If you did not connect before, did today's call make you reconsider reaching out to one of the programs?

<b>1. YES</b>	<b>2. NO</b>
---------------	--------------

**Appendix L**

**DEFENSE SLIDE DECK**




**FOOD INSECURITY**

**As A Pediatric Health  
Concern**

---

Keith F. Fishlock, MSN, APRN, PCNS-BC, FNP-BC, CPEN  
Faculty Mentor: Della Campbell, PhD, APRN, NE-BC, CNL  
School of Nursing, College of Health Sciences




## Background

Food insecurity (FI) -  
Inadequate amounts of  
nutritious food reliably  
accessed due to financial,  
social or other constraints

(Coleman-Jensen & Smith, 2017)

In 2015 the American  
Academy of Pediatrics  
recommended healthcare  
providers proactively screen  
for FI and intervene  
accordingly

(American Academy of Pediatrics, 2015)




Over 15 million American children (1 in 5) lived in food insecure households at some point during 2016

(Coleman-Jensen, Rabbitt, Gregory, and Singh, 2017)

2014-2016 average rate for food insecurity in Delaware over 3 years was 10.8%

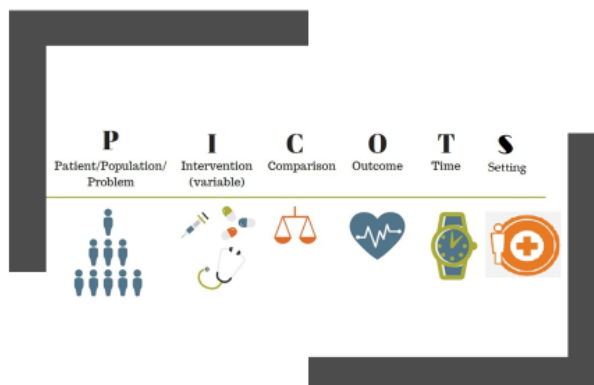
(USDA-ERS, 2017)

Systematic reviews reinforce links between childhood FI and potential detrimental lifelong health effects (Shankar, Chung, and Frank, 2017)



**1 in 5 kids**  
face hunger

## PICOTS Question



**In the pediatric population (P), how does the implementation of a standardized screening and referral protocol for food insecurity (I) compared to standard practice (C) influence referral/enrollment to appropriate resources (O) over 30 days (T) in a pediatric ambulatory emergency department (S)?**

## Evidence/Support for the Project

Inclusion criteria of English language, ambulatory environments, and peer-reviewed periodicals published since 2012



Yield of 1236 articles after duplicates removed. 28 final works appraised using the Johns Hopkins Hospital/University Evidence leveling system



Literature review supported FI screening and referral for vulnerable pediatric populations presenting to the emergency department

## Evidence/Support for the Project

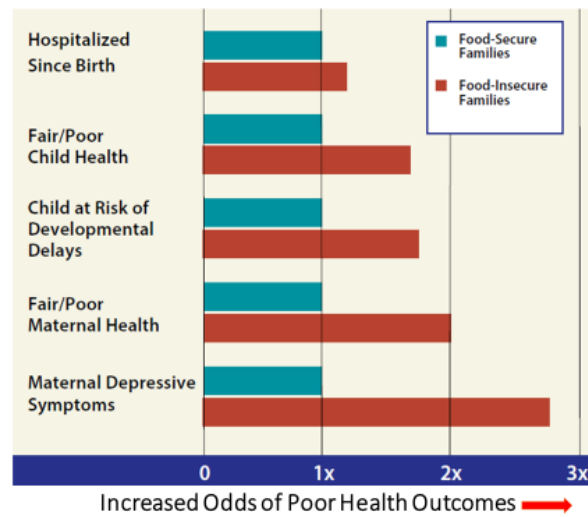
Diet quality has been inextricably linked as a predictor of health

(Marshall, Burrows, & Collins, 2014)

FI leads to potentially lifelong health effects impacting development, mental health, behavior, metabolism, cardiovascular, and endocrine (Shankar, Chung, and Frank, 2017)

Overall, under resourced families have less access to healthy food because they can't afford it, can't gain access to purchase it or both

## Evidence/Support for the Project



Goldman, N., Sheward, R., Ettinger de Cuba, S., Black, M. (2016, December 23). The Hunger Vital Sign: A New Standard of Care for Preventive Health. Retrieved April 7, 2019, from <http://childrenshhealthwatch.org/the-hunger-vital-sign-a-new-standard-of-care-for-preventive-health/>

## Evidence/Support for the Project

*70,000 Delaware Children live in low income families*

(2016 USDA-ERS)

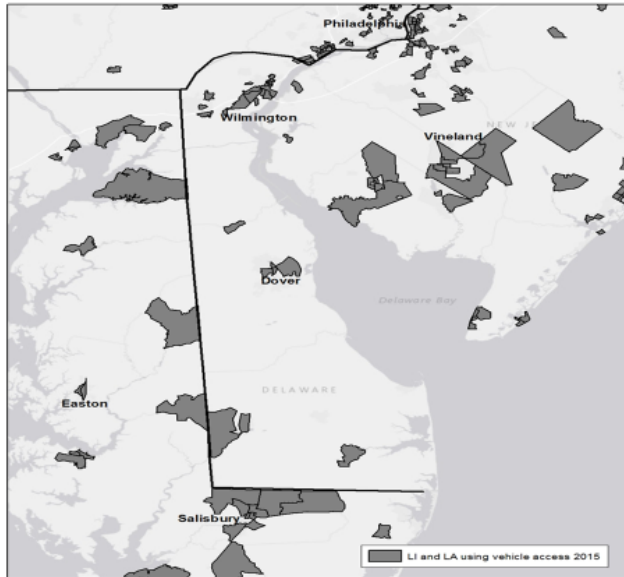
Food Deserts: DE, MD, PA and NJ numerous low-income census tracts 1-10 miles from full-service supermarkets

(2016 USDA-ERS)

Access to nutritious food is multifactorial: lack of money, transportation or lack of nearby food stores

(Bi, Haak, Gilbert, & Keller, 2017; Knowles, Rabinowich, De Cuba, Cutts, & Chilton, 2016)





D. Nulph (personal communication, June 18, 2018) of the USDA Economic Research Service

## Evidence/Support for the Project

## Evidence/Support for the Project

ED utilization higher amongst impoverished children, those utilizing Medicaid, or with lower parental education

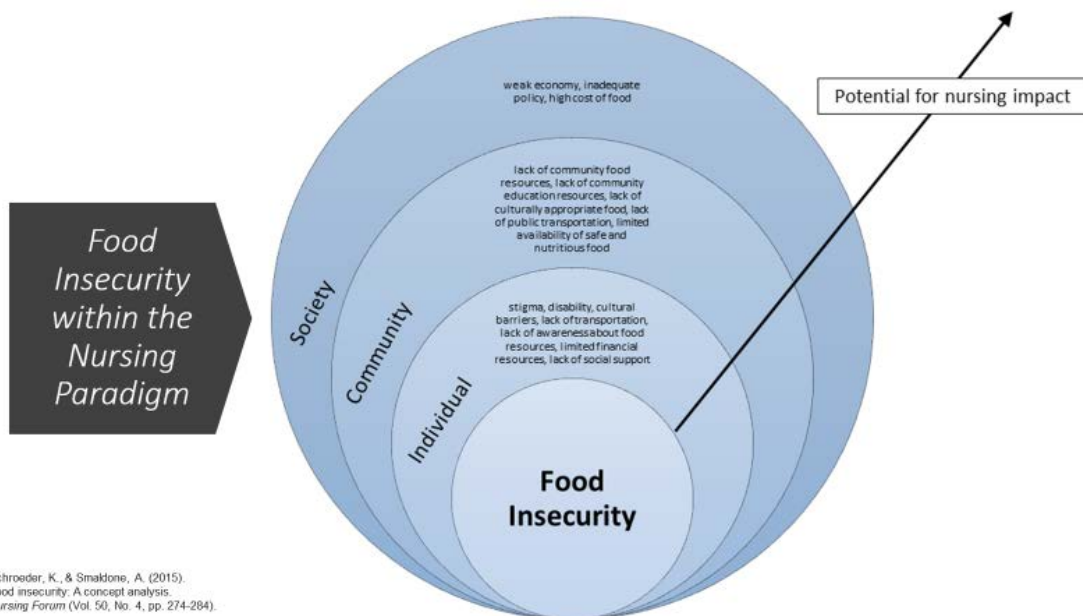
(Kroner, Hoffmann, Brousseau, 2010; Schlichting, Rogers, Gjelsvik, Unakis, & Vivier, 2017).

Pediatric studies \*50% prevalence of FI in the emergency room coupled with frequent ED use (\*convenience sampling)

(Doran et al., 2017; Pabalan et al., 2015)

Emergency departments well poised to provide resources to families that screen positive for food insecurity

(Alpern et al., 2014; Montalbano, Rodean, Kangas, Lee, & Hall, 2016).



Schroeder, K., & Smaldone, A. (2015).  
Food insecurity: A concept analysis.  
*Nursing Forum* (Vol. 50, No. 4, pp. 274-284).

## An effective tool to Screen for Food Insecurity

The Children's HealthWatch Hunger Vital Sign™ is comprised of two questions:  
(Hager et al., 2010)

a) Within the past 12 months we worried whether our food would run out before we got money to buy more

b) Within the past 12 months the food we bought just didn't last and we didn't have money to get more  
(Hager et al., 2010)

Sensitivity of 97%, specificity of 83% for pediatric and adolescent patients  
(Baer, Scherer, Fleegler, & Hassan, 2015; Hager et al., 2010)



## Methods: *Setting and Participants*

Nemours Alfred I duPont Hospital for Children (N/AIDHC) is a tertiary hospital, part of the larger Nemours Children's Health System.

N/AIDHC situated in Wilmington, New Castle County, Delaware and serves children of all ages residing in Delaware, Pennsylvania, Maryland and New Jersey.

The physical setting for this project was the N/AIDHC emergency department, a level one trauma center that served 60,000 pediatric patients in 2018.

Inclusion criteria for screening: Clinically stable children (ESI 3,4,5).

Exclusion criteria: Children presenting with acute illness/unstable life-threatening injuries.

## Implementation Phase 1



- **Phase 1: Pre-launch Plan**
- **(8/28-9/11/2018)**
- Screening for social needs was not yet standard clinical practice
- IRB approvals Nemours and University of Delaware
- Stakeholder meeting was held, SWOT Analysis completed
- FI and Hunger Vital Sign Screener education provided to staff over two-weeks

## Conceptualizing the screening plan

ED Retrospective  
census  
9/11-11/09/2017  
N=1,181  
patients/week

2017 8 week  
census 9,448  
patients

8176 (86.9%)  
met ESI 3-5  
(clinically stable)  
inclusion criteria

Potential for  
screening 8,000  
patients over  
eight weeks

## Implementation Phase 2

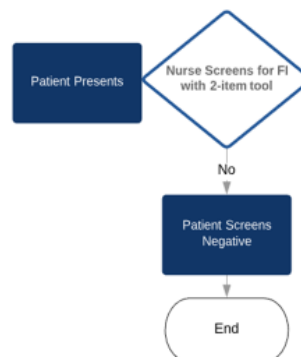
### Phase 2: 9/11-10/09/18

#### Launch of FI Screening Protocol

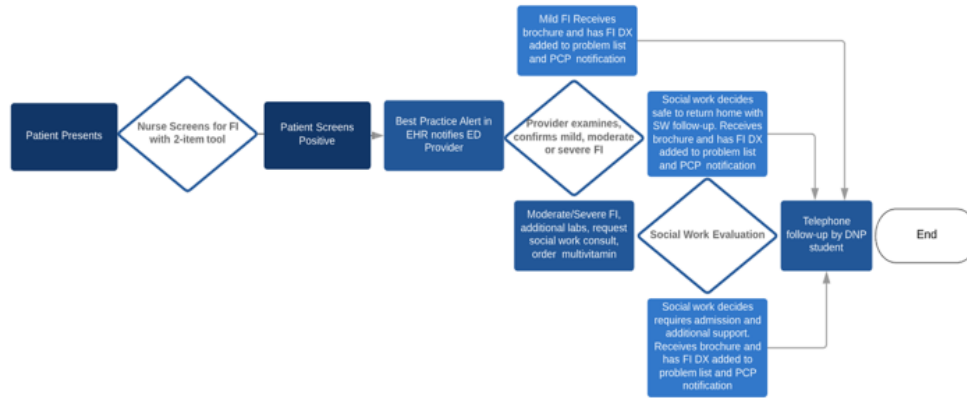
The Hunger Vital Sign was activated within the electronic health record (Epic™) as a routine screening tool for clinically stable children.

As an intervention, all families screening positive received a brochure with resources, including county, state and national food assistance programs and organizations that can assist with application processing.

## ED FI Screening Process Overview



# ED FI Screening Process Overview



# Hunger Vital Sign Integration Epic™

**Nutritional Assessment - Nutritional Concerns**

Time taken: 0749 8/27/2018 Show: ☐ Row

Values By [Create Note](#)

▼ Nutritional Assessment - We ask all of our patients about access to food because it's such an important part of managing your child's health.

In past 12 months have you worried your food would run out before you got money to buy more ☒ Often True ☐ Sometimes True ☐ Never True

In the past 12 months the food you bought didn't last and you didn't have money to buy more ☒ Often True ☐ Sometimes True ☐ Never True

# Best Practice Alert in Epic™

Positive screening triggers BPA's for provider

⚠ Patient has screened positive for food insecurity, please add this diagnosis to the problem list.

[Add Problem](#) [Do Not Add](#) **Food insecurity** [Edit details](#) (Hospital problem)

Problem:

Display:

Priority:  Noted:

Class:  Resolved:

☐ Chronic ☒ Hospital problem

☐ Principal Problem

Present on admission? ☐ Yes ☐ No ☐ Clinically undetermined

⚠ Patient has screened positive for food insecurity, please add this diagnosis to the problem list.

[Add Problem](#) [Do Not Add](#) **Food insecurity** [Edit details](#) (Hospital problem)

[Accept](#) [Dismiss](#)

BestPractice Advisory - Zttest, Lynne

⚠ Food insecurity diagnosis added - Food Resources Flyer

- Click to print: Food Resources Material (English)
- Click to print: Food Resources Material (Spanish)

Acknowledge Reason

N/A

# Brochure

**Do you need help feeding your family?**

Food is an important part of your child's health. There are many programs to help people get food. We want you to know what help is available.

The following are free and confidential services to help find local resources. The state-based 211 programs are available 24 hours a day, 7 days a week in 183 different languages.

Programs include education about eating healthy on a budget, local access to fresh food and vegetables, meal assistance services for your family, financial literacy food pantry support and help with applying for benefits.

**State- and County-Based Resources**

State	Phone	Text	Email	Food Bank (County)
Delaware	2-2-1 or (800) 568-4372	(302) 251-3684	info@delaware211.org	(302) 250-1200 (New Castle) (302) 434-0311 (Kent, Sussex) (302) 434-0311 (Wilmington)
Illinois	2-2-1 or (800) 450-0838	(618) 655-9625	info@ill211.org	(618) 396-0335 (Cook) (618) 396-0335 (DuPage)
New Jersey	2-2-1 or (877) 952-1148	888-211	info@nj211.org	(973) 970-0300 (Atlantic County) (973) 970-1200 (Camden)
Pennsylvania	2-2-1 or (800) 954-7502	888-211	info@pa211.org	(717) 688-8900 (Delaware, Philadelphia, Montgomery)

**Other Food Assistance**

Program	Description	Website	Phone	For Help With Your Application
National Hunger Hotline	Local food pantries	hungerhotline.org	(866) 348-6479 (877) 8-438844	Delaware Rural (302) 250-0000
School Breakfast and Lunch Programs for children	Free or reduced price lunch by meals for income-eligible students of all ages	the.usda.gov/ncsl-ncsl/school-meals-contacts	(866) 348-6479	NO Department of Human Services (800) 451-5657
Summer Food Service Program (SFS)	Free healthy meals during the summer for students 18 and under	the.usda.gov/sfs	(866) 348-6479	NO Department of Human Services (800) 451-5657
Supplemental Nutrition Assistance Program (SNAP)	Money to purchase food. The average benefit is about \$127 per month per person.	the.usda.gov/snap	(800) 221-5649	NO Department of Human Services (800) 451-5657
WIC (Women, Infants and Children Program)	Money to purchase food for pregnant/postpartum women, infants, and children under the age of 5. Nutrition education and breastfeeding support also provided.	the.usda.gov/wic	(866) 348-6479	NO Department of Human Services (800) 451-5657

For more information, visit [nemoursduPont.org](http://nemoursduPont.org).

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## Implementation Phase 3

- **Phase 3: Follow Up**
- **10/09-12/09/2018**
- Telephone follow-up initiated by the team leader on rolling 30-day post visit basis:
  - Ascertain perceptions of screening
  - Identify if families connected to services.





## Screening Follow Up Calls by Week

Screening Weeks 1-8 Phone Follow-up Weeks 5-12	Total during timeframe	Week 1 9/11-9/18	Week 2 9/18-9/25	Week 3 9/25-10/2	Week 4 10/2-10/9	Week 5 10/9-10/16	Week 6 10/16-10/23	Week 7 10/23-10/30	Week 8 10/30-11/06	Week 9 11/06-11/13	Week 10 11/13-11/20	Week 11 11/20-11/27	Week 12 11/27-12/4
Total visits to the ED	9543	1190	1145	1118	1184	1273	1234	1222	1177	*While no data was collected for DNP Project during this time, screening continued as a sustained standard of care			
Eligible to be screened (levels 3,4,5)	N=8292	1023	1004	961	1046	1069	1101	1064	1024				
Intent to screen	n=6151	644	703	713	793	770	834	846	848				
Completed screened (levels 3,4,5)													
Positive FI Result	117	3	8	14	17	15	18	23	19				
Phone calls attempted (Max 3 calls)	351	X	X	X	X	9	24	42	51	45	54	69	57
Phone calls completed	80	X	X	X	X	2	6	12	13	8	13	12	14

### Follow-Up Screener

[1285429] FI as A Pediatric Health Concern

*Script: Hi, my name is Keith and I am calling from Nemours ED. When you were in the ED, we asked some questions about food. I wanted to ask you five questions about your experience if you have the time.*

1. While in the emergency room, on a scale from 1 to 5 how safe did you feel discussing food issues?

1 Very safe 2 Safe 3 Somewhat safe 4 Not safe 5 Very unsafe

2. While in the emergency room, on a scale from 1 to 5 how comfortable did you feel talking about FI with your care team?

1 Very comfortable 2 Comfortable 3 Somewhat comfortable 4 Not comfortable 5 Very uncomfortable

3. Did you understand how to apply for benefits?

1. YES 2. NO

4. Were you able to connect with any of the services we shared?

a. SNAP	YES	NO
b. WIC	YES	NO
c. National Hunger Helpline	YES	NO
d. School breakfast/lunch program	YES	NO
e. Summer meals for children	YES	NO
f. Local food bank	YES	NO

5. If you did not connect before, did today's call make you reconsider reaching out to one of the programs?

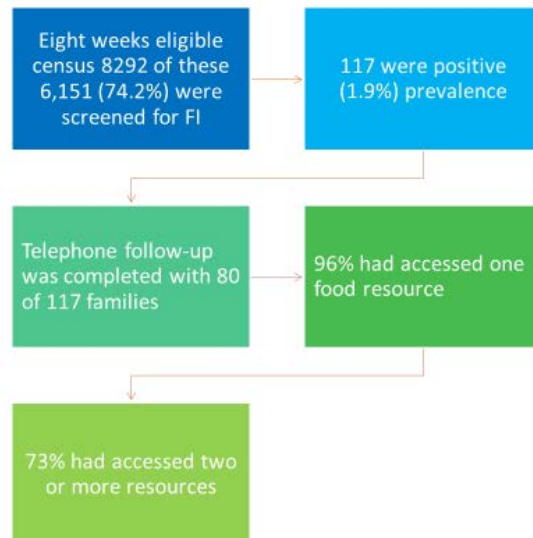
1. YES 2. NO

## Implementation Phase 4

- **Phase 4: Close Out**
- **11/30-12/09/2018**
- The N/AIDHC emergency department continues to screen for FI and distribute the food resource brochure sheet.
- Escalation to social work also continues as necessary to meet patient and family care needs.
- Final data compiled



## Findings



## Data from 30 Day Follow Up

Top three successful resource connections for families:

Local food bank (n= 62, 80.5%)

Supplemental Nutrition Assistance Program (SNAP) (n=32, 23.1%)

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (n=22, 28.57%)

## Data from 30 Day Follow Up

In regards to the screening:

Most participants reported feeling safe or very safe (n = 76, 95%)

Comfortable or very comfortable (n = 70, 87.5%) with screening

No difficulty in understanding how to apply for benefits (n = 72, 90.0%)

Follow-up call made a few people (n = 3, 3.75%) reconsider reaching out to one of the programs

## Top Diagnoses: Children presenting with FI

- Respiratory ailments/upper respiratory infection URI (13.8%)
- Moderate persistent asthma (5.0%)
- Acute obstructive laryngitis (3.8 percent)



## Demographics

Most had Medicaid as their insurance 99 (84.620%)

51 (43.6%) identified as female

66 (56.4%) identified as male

Over half of the children 63 (53.85%) were ages five and under

Average age was 5.88 years (SD = 5.090)

## Demographics

Ethnicity non-Hispanic/non-Latino ( $n = 82$ , 70.09%)

Remainder ( $n=35$ , 29.91%) identifying as Mexican, Mexican-American, Puerto-Rican, or other Spanish origin

Race was described as Black/African American ( $n = 53$ , 45.3%)

Other ( $n= 36$ , 30.77%)

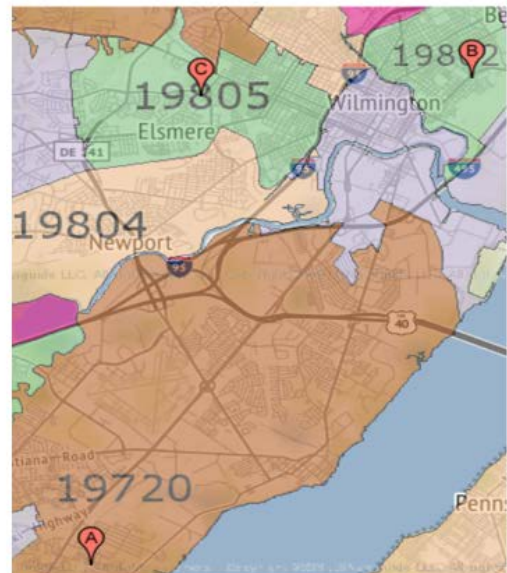
White/Caucasian ( $n = 28$ , 23.93%)

## Regional Distribution: Children in ED identified as FI

A: New Castle, 19720 ( $n = 34$ , 29%)

B: Wilmington, 19802 ( $n = 19$ , 16.2%)

C: Elsmere, 19805 ( $n = 14$ , 11.9%)



## Conclusions

After an extensive review of the literature, professional staff in a pediatric ED deployed both FI screening and resource intervention during an eight-week trial.

A FI tool was incorporated into the EHR and 150 staff trained.

Assessment of FI can be successful in high-volume ambulatory care environments as evidenced by identifying 2% of families and providing those that screened positive with a resource

Follow-up of those screened positive showed that 96% successfully connected to resources using one-page brochure

As an annualized comparison in this setting, 2% of families (N=117) over two months is potentially equivalent to more than 700 families over one year.

## Limitations

Face to face social determinant screening methodologies

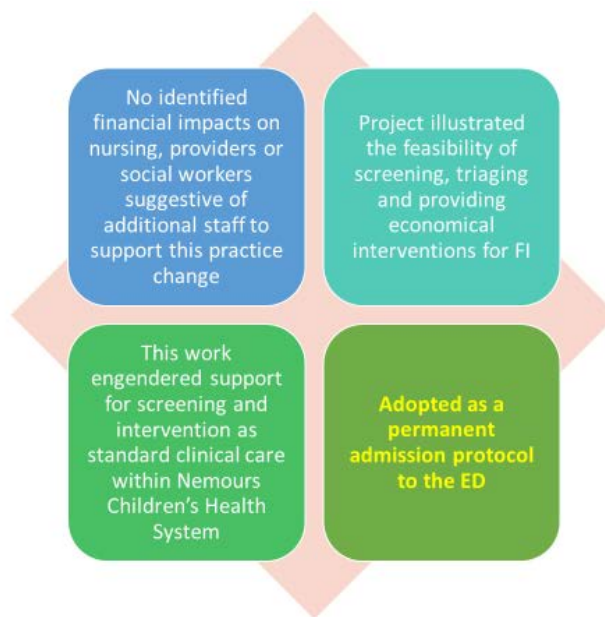
The rate of FI disclosure was much lower than that reported in similar settings (Pabalan et al., 2015)

No mechanism built within the EHR to record refused versus not completed screening

Screening was not performed in 26% of children presenting to the ED who met the screening criteria

Truncated time period allocated for project

## Sustainability



## Implications for Advanced Practice

American Academy of Nursing -Need to assess and address poverty-related issues and far-reaching effects on children's physical and mental health (Lucine, DePriest, Wilson, & Gross, 2018)

Nurses have moral obligations to support family and societal health and FI offers nurses an important opportunity for meaningful community impact.

Through education, advocacy and policy formation, APRNs can promote awareness that children who live in poverty are most vulnerable to FI.



Special Thanks to my Committee Members

---

## **Faculty Mentor**

Della Campbell, PHD, APRN, NE-BC, CNL

---

## **Project Site Mentor**

Aaron E. Carpenter, DNP, M.Div, APRN



Questions and  
Commentary

## References

- Alpern, E. R., Clark, A. E., Alessandrini, E. A., Gorelick, M. H., Kittick, M., Stanley, R. M., ... & Pediatric Emergency Care Applied Research Network (PECARN). (2014). Recurrent and high-frequency use of the emergency department by pediatric patients. *Academic Emergency Medicine*, 21(4), 365-373.
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