Mapping of Pediatric Chronic Illness Sequelae to Inform Evaluation Planning

Akshita Nayyar, MSEd, Brandon Conaway, MSEd, Maria Tina Benno, MSEd, Cassondra Griger, MSEd, Braelyn Tracy, MSEd, Kirstin Franklin, BS, & Ara Schmitt, PhD

Duquesne University, Pittsburgh, Pennsylvania

DUQUESNE UNIVERSITY
SCHOOL OF EDUCATION

Abstract

School psychologists must be aware of the psychoeducational sequelae of pediatric chronic illnesses in order to engage in effective and comprehensive evaluation planning. This study identified 12 pediatric chronic illnesses frequently encountered by school psychologists and then surveyed the empirical literature to learn about the neuropsychological and educational sequelae of the conditions, as well as the amount of supporting evidence. Results reveal that school psychologists must be prepared to evaluate across numerous functional domains for most chronic illnesses. Implications for training and practice are discussed.

Introduction

Chronic illness is defined as a lasting medical condition which requires medical intervention on a continuous basis and has implications for a child's psychoeducational functioning (Riccio et al., 2014; Torpy et al., 2010). Pediatric conditions often negatively impact the neurocognitive and social-emotional development of children. In fact, children who experience chronic illnesses are at great risk for academic underachievement and other functional deficits (Shapiro & Manz, 2004). Schools play a pivotal role in providing comprehensive services tailored to the unique needs of children and families (Shapiro & Manz, 2004) and facilitating positive outcomes for children by collaborating with health care providers (Drotar et al., 2004). In order to provide needed services for children with chronic illnesses, school psychologists engage in the comprehensive evaluation of the students. A team of multidisciplinary professionals then use that information to determine if the student qualifies for special services under the IDEA category of Other Health Impairment (OHI; Wodrich & Spencer, 2007). Important for school psychologists to recognize is that an evaluation plan for any child must account for all areas of suspected disability (IDEA, 2004). To facilitate the comprehensive evaluation of students with chronic illnesses, this study reviewed the available empirical literature to identify the neuropsychological and educational sequelae associated with pediatric conditions that are commonly encountered by school psychologists (Barraclough & Macheck, 2010). The findings of this study inform school psychologists of the targets of assessment that should be integrated into a comprehensive evaluation in order to meet our legal mandate.

Table 1. Neuropsychological and Educational Sequelae of Pediatric Chronic Illnesses

Chronic Illness	Prevalence	Incidence	Neurocognitive Implications						Academic Implications				Socio-emotional Implications	Adaptive Behavior Implications
			Processing Speed	Verbal Reasoning/ Language Skills	Nonverbal Reasoning/ Spatial Skills	Memory/ Learning	Attention/ Executive Functioning	Motor	Reading	Writing	Math	Attendance		
Asthma	8.4% of children	1 in 13	2	2	3	2	2	2	3	0	1	3	3	2
Epilepsy/Seizure Disorder	0.6% of the population aged 0-17	50/100,000 per year	3	3	3	3	3	2	3	3	3	3	3	3
Cerebral Palsy	8,000-10,000 born each year	2.6-2.9/1000; 2.3-3.6/11000	2	3	3	3	3	3	2	2	2	1	2	2
Diabetes	210,000 under the age of 20 in 2018	Type 1: .35-2.55 per 1000; Type 2: 1.20 per 1000	2	3	3	3	3	3	3	2	3	3	3	3
Cancer	5,000 to 6,000 adolescents diagnosed each year with cancer	11050 diagnosed in 2020	3	1	3	3	3	3	3	1	3	3	3	3
Cystic Fibrosis	More than 70,000 worldwide	1 in 4 children will develop CF	1	2	1	3	1	1	0	0	0	3	2	1
Low Birth Weight/High-Low Birth Weight	313,752 babies born with low birth weight	Unknown	2	3	2	2	3	2	3	1	2	0	2	2
Very Low Birth Weight			3	3	2	2	3	2	3	0	3		3	2
Extremely Low Birth Weight			3	3	3	3	3	3	3	1	3		3	3
Sickle Cell Disease	100,000 individuals in 2020	15.5 cases per 1000 in 2010	3	3	3	3	3	3	3	3	3	3	3	3
Spina Bifida	1,500 cases each year	3.1 cases per 10,000 in 2002	3	3	3	3	3	3	3	3	3	2	3	3
Brain Tumor	4,000 each year	4,000 per 100,000	3	3	3	3	3	3	3	1	3	1	3	3
Muscular Dystrophy	250,000 individuals	1 in 3,500	2	3	2	3	2	3	2	2	2	1	2	2
HIV/AIDS	1.1 million worldwide	1 in 7	2	2	1	2	1	1	2	2	2	2	3	0

Methods

1. Pediatric chronic illnesses to review were identified from Barraclough and Macheck's (2010) study that explored school psychologists' roles in serving with children with chronic illnesses. Eleven pediatric conditions from that study and 1 additional condition (low birthweight) were included in this review (see Table 1).
2. In order to obtain empirical articles for review, literature searches were conducted by cross referencing PsychInfo, ERIC, and Medline databases. The searches were conducted by entering the name of a pediatric condition and then systematically entering the following terms: neuropsychological, academic, processing speed, verbal reasoning, language, nonverbal reasoning, spatial skills, memory, learning, attention, executive functioning, motor, reading, writing, math, attendance, social-emotional, and adaptive behavior. Two different research assistants independently conducted these literature searches.
3. By decision rule, articles within the past 20 years were acquired from the literature searches if the article contained empirical information regarding the neuropsychological or psychoeducational functioning of children with that condition. Meta-analyses were also included.
4. Two research assistants independently coded the empirical articles and recorded findings using an Excel spreadsheet. If the article noted reduced neuropsychological or educational functioning on the domains of interest for this study, it was coded as "yes, evidence of reduced functioning on this domain." Because this process was done by two research assistants for each pediatric condition, overlapping articles/codes were identified and collapsed into one code to eliminate duplicate data.
5. Once three empirical articles were identified that demonstrated reduced functioning on that domain, no further articles were reviewed as it was determined there was sufficient evidence to conclude that domain of functioning should become a target of evaluation for school psychologists as it might be an area of suspected disability.
6. Table 1 uses green to indicate the existence of at least 3 articles to reach the conclusion, yellow to indicate the presence of 1 or 2 articles, and red to indicate no existing empirical article supported the evaluation of that domain.
7. The prevalence and incidence rates of each condition were also identified by consulting publications national organizations, like the American Academy of Pediatrics (2018).

Discussion

- Results of this study affirm that the pediatric chronic illnesses most commonly encountered by school psychologists are associated with a broad array neuropsychological and educational sequelae.
- School psychologists will likely not be surprised that neurologic disorders such as epilepsy, spinda bifida, and brain tumor are associated with negative psychoeducational outcomes. The present findings point out, however, that non-neurologic disorders like asthma, diabetes, and sickle cell disease are also associated with negative outcomes across domains of functioning.
- Previous research has linked school absence with academic skills deficits (e.g., Crump et al., 2013). Biologically-based sequelae in tandem with school absences may contribute to educational impairments noted in the reviewed studies.
- When evaluating a student with any chronic health condition, school psychologists must develop a complex evaluation plan in order to ensure all possible areas of disability are covered. This study provides evidence that reduced performance in nearly domains of functioning may be "suspected."
- If a school psychologist does not feel prepared to evaluate students in each of the functional domains included in this investigation, we argue that is the school psychologist's ethical responsibility to engage in training and supervised practice in order to develop those skills.
- This study is limited by the extent to which these pediatric conditions appear in the empirical literature and the extent to which the particular domain of functioning has appeared in the literature for that condition. For example, we discovered that written expression and school attendance do not commonly appear to be targets of study. Therefore, we encourage cautious interpretation of the red cells. A red cell may not not mean that no study that targeted that area has found evidence of reduced performance. It may simply reflect a lack of available research and an area in need of additional study!