The Journal of Special Education Apprenticeship

Volume 12 | Number 2 Article 9

6-2023

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THE JOURNAL OF SPECIAL EDUCATION APPRENTICESHIP
June 2023, Vol. 12, No. 2, 97 -115.
ISSN 2167-3454 http://www.josea.info/web/public/

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ABSTRACT

Students with chronic health conditions experience many challenges, such as increased school absences, that may impact academic success. Additional academic problems exist for students with chronic health conditions who also have socioeconomic status (SES) factors. A systematic literature review as conducted to study the interactions between chronic health conditions, absenteeism, and factors associated with SES. Findings suggest that asthma, the most common chronic health condition in children, is the leading cause of health-related school absences. Findings also suggest that factors associated with SES, such as family income, also impact school attendance for students with chronic health conditions. Although the results are mixed for academic achievement abilities for student who have chronic health conditions, many academic challenges that students with chronic health conditions encounter can be explained by frequent school absences. Further research on school absences and SES factors affecting students with chronic illnesses is needed to help establish guidelines for appropriate school programming and positive school attendance support.

KEYWORDS

chronic health conditions, school attendance, socioeconomic status

ARTICLE HISTORY

Received January 24, 2022
Revised May 2, 2023
Accepted May 17, 2023

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Students with chronic health conditions are a diverse population of learners that may experience challenges within the educational environment. Frequent school absences due to hospitalizations or receiving treatment in outpatient settings can cause students with chronic health conditions to miss a substantial amount of schooling (Irwin et al., 2018). Because there is a lack of standardization within the definition of pediatric chronic health conditions, the types of pediatric chronic health conditions and the number of children diagnosed with such conditions vary depending on medical diagnosis methodology and chronic health definitions (Compas et al., 2012). For example, Crump et al. (2016) defined pediatric chronic health conditions as medical conditions that have occurred for at least three months and involve activities of daily living deficits or increased medical needs that are exacerbated for

the individual's age. However, Van Cleave et al. (2012) defined pediatric chronic health conditions as a physical, mental health condition, or emotional disorder that prevent any child or adolescent from attending school on a regular basis, lead to the inability to complete schoolwork appropriately and the need to seek medical treatment on a continual basis. Van Cleave et al. also categorized pediatric chronic health conditions as falling within four groups: asthma, obesity, behavior or learning difficulties, and other physical conditions. According to the Centers for Disease Control and Prevention (2020) as many as one in four or 25% of school-aged children in the United States have been diagnosed with a chronic illness. Some examples of chronic health conditions are asthma, diabetes, and epilepsy.

Students who have been diagnosed with chronic health conditions may experience increased rates of school absences. School attendance rates are mixed across different medical diagnoses, with greater rates of absences associated with disease severity (Lum et al., 2017). Academic success is influenced by school attendance**.** In other words, students who attend school on a regular basis are more likely to perform well in school (Carroll, 2010). School engagement and motivation are also factors that impact school performance. For example, students who are engaged and motivated are more likely to have increased attention, participation, and effort in the educational setting than students who are less engaged (Forrest et al., 2011).

SES Characteristics and School Attendance

Socioeconomic status (SES) is defined as social and economic factors that help to develop an individual's societal position (Lynch & Kaplan, 2000). Common indicators of SES are educational level, annual income, and occupation (Needham et al., 2013). School systems typically use student enrollment within the free and reduced lunch program as the standard SES measure. However, family income threshold changes within the national free and reduced lunch policy have impacted student eligibility (Chingos, 2016). Some states, such as North Carolina, for example, use both enrollment within the free and reduced lunch program and parental education levels to determine school SES (Armor et al., 2018). Variability within SES definitions can cause difficulty when comparing populations on a national level and discussing interactions between poverty, chronic health conditions, and absenteeism.

Education is often one of the key indicators of the social determinants of health, whereas school attendance is seen as a driver of academic success (Yoder, 2020). Conversely, frequent school absences have many negative consequences from reduced academic achievement to lower annual adult income rates (Allen et al., 2018). Frequent school absences may also impact high school graduation rates. Dropping out of school prior to graduation usually occurs after high rates of school absenteeism (Thurlow et al., 2002). Chronic absenteeism, which is defined as being absent for approximately 10% of the school year, or 18 days, significantly impacts academic performance (U.S. Department of Education, 2016). Although school absences are associated with poor school outcomes for all children, absenteeism most often continues the cycle of economic and social hardships in children who live in poverty (Balfanz & Byrnes, 2012; Nauer et al., 2008).

Chronic Health Conditions, School Attendance, and Poverty

Children who have been diagnosed with chronic health conditions experience challenges that impact school performance. For example, some chronic health conditions may cause physical impairments which can make accessing school environments challenging for some students

(Emerson et al., 2016). Other children who have been diagnosed with chronic health conditions may experience systematic stress that comes from being socially disengaged from peers due to school absences (Shaw & McCabe, 2018). According to Emerson and colleagues, there are undoubtably some academic and social challenges that children with chronic health conditions face that are related to school absences, however, other family and societal variables may contribute to decreased school outcomes. Children living in poverty, with a disability, or with a chronic illness experience significant health disparities and a higher risk of school dropout (DePaoli et al., 2017).

School Reentry Needs for Students With Chronic Health Conditions

Given increased supports needed for students with chronic health conditions, school reentry programs exist to facilitate transitions between medical and educational settings. According to previous research, school personnel feel unprepared to provide appropriate academic and social support to students with chronic illnesses (Wikel & Markelz, 2023). Therefore, school reentry programs benefit students with chronic illnesses by helping to address academic and social needs of this student population. The design and purpose of school reentry programs fall into three categories: 1) education of school personnel, 2) peer support programs, and 3) individual student with chronic illness support (Prevatt et al., 2000; Wikel & Markelz, 2023).

Education of School Personnel

Reentry programs that are designed for school personnel programs are customized education programs aimed at educating school personnel on specific chronic illnesses (Prevatt et al., 2000). School personnel reentry programs consist of providing chronic health condition education to classroom teachers and school administrators either through in-person training sessions or through an online education format (Wikel & Markelz, 2023). Results from school personnel focused reentry programs show that the participants gain an increased level of knowledge and confidence in working with students who have chronic health conditions (Wikel & Markelz, 2023).

Peer Support Programs

Peer support programs are another type of school reentry model that are used to provide age-appropriate chronic illness education to school-age students (Wikel & Markelz, 2023). These programs help to address peer perceptions and attitudes regarding chronic illnesses. The elements of peer support programs focus on providing in-person chronic illness education sessions in combination with printed materials on specific chronic illness conditions (Wikel & Markelz, 2023). The benefit of the in-person education sessions is that the peers are given opportunities to ask questions specific to chronic illness. The literature surrounding peer support programs show that these programs increase the participants' general knowledge surrounding chronic illness (Canter & Roberts, 2012). However, the research shows that peer support programs do not correlate to changes in peer attitudes or beliefs surrounding chronic illness (Wikel & Markelz, 2023).

Individual Student Support

Individualized school reentry programs focus on a comprehensive approach to school reentry. These programs are usually initiated by hospital liaisons who are employed by hospitals and are assigned to help address the educational and social needs of patients with chronic illnesses (Prevatt, et al., 2000). The main tasks of the hospital liaisons are to increase the collaborations between hospital settings, schools, and families (Wikel & Markelz, 2023). Because hospital liaisons have backgrounds in education as well as training in medical methodologies, they are well suited for leading individualized student support programs (Northman et al., 2015).

Although all three school reentry programs aid in the hospital to school transition process for students with chronic illnesses, individualized student programs have demonstrated the most positive effect in addressing academic and social outcomes (Wikel & Markelz, 2023). For example, research into individualized student support programs have shown positive outcomes in school engagement and school attendance for students with chronic illnesses (e.g., Colbert et al., 2020; Koontz et al., 2004). Yet, given promising outcomes for reentry programs, many educational challenges still exist for students with chronic health conditions with associated poverty.

Purpose of the Study

Although many of the educational difficulties that students with chronic health conditions experience can be attributed to school attendance, other factors relating to medical diagnoses may exacerbate school challenges. Previous research on supporting students with chronic health conditions has not examined the possible confounding effects of poverty on absenteeism. Given the complexity and severity of these conditions on student outcomes, the purpose of this review was to study the extent to which the field has examined chronic illness, chronic absenteeism, and poverty.

Research Questions

The following research questions guided our analyses:

1. What are the characteristics of articles that have examined interactions between chronic illness, chronic absenteeism, and poverty?
2. What are the characteristics of participants included in articles that have examined interactions between chronic illness, chronic absenteeism, and poverty?

Method

Section Criteria and Eligibility

Using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) screening tool developed by Moher et al. (2009), the authors conducted a systematic literature review to identify peer-reviewed articles focusing on students with chronic health conditions, factors associated with socioeconomic status, and school attendance. Three eligibility criteria categories were established as a protocol screening tool to identify articles. To be included in this systematic literature review, each article was screened by the three categories established exclusively for this research. The three categories are listed as follows: (a) the article must focus on primary or secondary students with chronic health conditions and socioeconomic factors that

impact school attendance, (b) the research occurred within the United States, and (c) the article must be peer-reviewed within the past twenty-five years.

The authors allowed various factors of SES, such as poverty, low-income, and parental educational attainment to be included within the article search criteria. However, to be included within this literature review, SES factors needed to be used in conjunction with students with chronic health conditions and school attendance. Different versions of school attendance, absenteeism, and school nonattendance were allowed when used in combination with SES and chronic health conditions. Finally, to be included within this research, articles needed to be peer-reviewed and focused within the United States. Students with chronic health conditions may be found eligible to receive education support and related services under the Individuals With Disabilities Education Improvement Act (2004) and/or accommodations through the Rehabilitation Act of 1973. Both pieces of legislation are central to the United States.

Information Sources and Search Terms

A search was conducted of the following databases: Eric (EBSCOhost), PsycInfo (EBSCOhost), PubMed and Google Scholar, using search terms relative to each database. The Eric (EBSCOhost) database was searched using "school attendance or school absences or school nonattendance" AND "chronic absenteeism in schools" AND "poverty or low-income or low socioeconomic or disadvantaged" as key words. PsycInfo (EBSCOhost) was searched using "chronic illness" AND "quality of life" AND "school attendance or school absence or school nonattendance" as search terms. The PubMed article database was searched by using "chronic illness in children" AND "school attendance" AND "poverty" as key search terms. Lastly, Google Scholar database was scanned using "chronic illness in children" AND "school attendance" AND "poverty" as search terms.

Additional articles were found by completing an ancestral article search of pertinent articles as well as a hand search of the *Research, Advocacy, and Practice for Complex and Chronic Conditions* from the years 2013 through 2019. The *Research, Advocacy, and Practice for Complex and Chronic Conditions* is a peer-reviewed journal that is published on a semi-annual basis. Both the ancestral search of pertinent articles and hand search of the *Research, Advocacy, and Practice for Complex and Chronic Conditions* were reviewed using "chronic health conditions" AND "chronic absenteeism" AND "socioeconomic factors" as included search terms.

The search terms were applied to each database which revealed a total of 57 articles. Seventy-seven articles were found by searching the Google Scholar database. Six articles were found through the ancestral article search of pertinent journals focused on school attendance for students with chronic health conditions. Finally, the hand search of the *Research, Advocacy, and Practice for Complex and Chronic Conditions* did not yield any articles (See Figure 1).

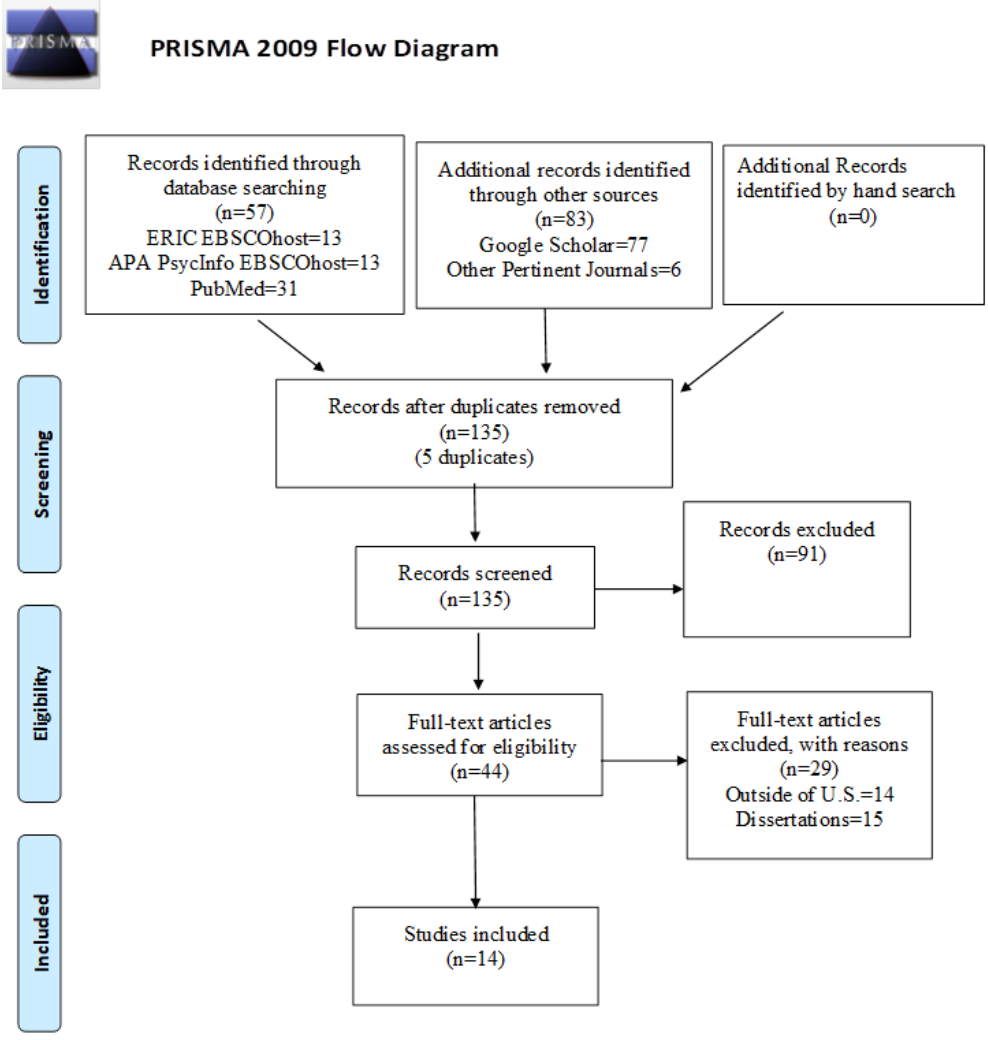
Article Screening

After the duplicates were removed, 135 articles were left to be evaluated by using the search criteria specific for this research. The authors excluded ninety-one articles during the initial article screening phase. Reasons for exclusion include research focused solely on educational needs for students with chronic health conditions without the included variables of SES or chronic absenteeism. Other articles were excluded during the initial screening phase because the research pertained to school reentry programs for students with chronic illness, which was out of scope for

this paper. Finally, articles published by state education agencies describing how to reduce chronic absenteeism within individual states were eliminated.

The forty-four articles that remained were then rescreened for eligibility using the article full texts against the defined search criteria. Twenty-nine articles were eliminated during this process. Fourteen articles were excluded because the articles were focused outside the United States. Fifteen dissertation articles were removed from this review as these articles are not peer-reviewed articles. Finally, a literature review was removed because the article did not discuss factors associated with SES in relation to chronic illness and school attendance. After final review of the articles using the PRISMA methodology, fourteen articles remained for this review (see Figure 1).

Figure 1.



Article Characteristics Coding

To answer research question one, articles were coded against the type of research design specific for each article. The authors included articles that were classified as systematic literature reviews, qualitative research, and descriptive articles. Quantitative research studies, including survey data

obtained from national or local databases, were included if the research contained statistical analysis of the data. For articles that implemented an intervention, we coded the type of intervention

To better understand the audience for articles focused on academic outcomes for students with chronic health conditions, the articles for this paper were reviewed for the type of journal in which the articles were published. Journal types were reviewed and cataloged for the scope of published articles. Articles that were published in journals that focused on health and rehabilitation audiences (e.g., medical practitioners, nurses, and other healthcare providers) were coded as medical journals. Conversely, articles that were written for educators (e.g., teachers, administrators, school nurses, etc.) were coded as educational.

Participant Characteristics Coding

To answer research question two, we coded articles based upon the participant characteristics, explanation of school attendance, and socioeconomic factors. Included articles were coded as having specific measures outlining pre/post school attendance interventions. The socioeconomic factors (i.e., free/reduced lunch, parental education levels, etc..) were also coded based upon the identified factors found in the included articles. Finally, participant characteristics were reviewed for specific chronic health conditions and coded on the impact to school attendance.

Results

Fourteen studies identified for this review were summarized based upon both article characteristics and participant characteristics. Article characteristics are listed as: (a) study design (national database analysis; singular hospital database analysis, etc.), (b) intervention, (c) results, and (d) journal published. Participant characteristics are identified as: (a) specific chronic illness, (b) *n* size, (c) chronic illness definition, (d) school attendance and/or absenteeism definitions, and (e) socioeconomic factors. Results are presented in relation to each research question. Individual study results are represented in Table 1. Specific study results are mentioned whenever there is a need for elaboration on detailed outcomes.

Article Characteristics

Study Design

The fourteen studies were reviewed for specific study designs and research methodology. Sixty-four percent of the included articles (*n*=9) employed quantitative research methods through surveys and by using a database unique to the state, school district, or hospital facility. Three articles (Hsu et al., 2016; Miller et al., 2016; Richardson et al., 2018) researched education outcomes for students with chronic health conditions by surveys with records from national databases. One article (Yoder, 2020) was identified as a literature review. Finally, research by Allen et al. (2018) was a descriptive article that discussed the importance of physicians addressing positive school attendance for students with complex health conditions.

Table 1. **Articles Included in Review**

Article Characteristics					Participant Characteristics			
Study	***Design***	***Journal***	***Intervention***	***Results***	***n***	***Chronic illness***	***Chronic absenteeism***	***SES***
Allen et al. (2018)	Descriptive	M	Examination of school absenteeism and the immediate & long-term negative effects on academic performance, social functioning	MDs assisted with school action plans, consultation with schools	N/A	Asthma, diabetes mellitus, obesity	Absent at least 10% of the school year; 18 days	Food insecurity, housing instability, transportation issues
Clark et al. (1990)	Quantitative: Survey of single school district	M	Examination of communication between low income urban parents/children about asthma management	Families who spoke Spanish & had private insurance communicated frequently about asthma management	239 children	Asthma	Asthma related absences compared with general population	Mothers' education levels, Medicaid
Crump et al. (2013)	Quantitative: Survey of single school district	M	Investigation whether CHC correlate with low academic performance	CHC were associated with low ELA and math performance	22,730 children	Asthma seizure disorders, ADHD, autism, mental health disorders, etc.	Number of days absent compared with control group	Enrolment in schools' free/reduced lunch program
Emerson et al. (2016)	Quantitative: Survey of single medical center	E	Investigation of the MEND Program for children with CI	Higher parent-rated physical functioning of children correlated with decreased absences	48 children	Type 1 diabetes, nephrotic syndrome, transplant, cancer	Number of days absent pre/post intervention	Medicaid
Fowler et al. (1985)	Quantitative: Survey from single medical center	M	Examination of academic performance and absences among children with CI	Children with CI have higher rates of absences, achievement is related to medical diagnosis.	270 children	Arthritis, blood disorders, cardiac diseases, diabetes, etc.	North Carolina state norm of 7 days absent per year	Mothers' education level, parental working status, & marital status
Hsu et al. (2016)	Quantitative: Survey from	M	Examination of asthma related school absences in conjunction with asthma control	Asthma related school absences were associated with uncontrolled	8,881 children	Asthma	1 or more days missed due to asthma	Medicaid, family income level

Article Characteristics					Participant Characteristics			
Study	*Design*	*Journal*	*Intervention*	*Results*	*n*	*Chronic illness*	*Chronic absenteeism*	*SES*
	national database			asthma, asthma attacks, and environmental factors				
Miller et al. (2016)	Quantitative: Survey from national database	E	Investigation of the prevalence and cost of various CHD	Asthma, diabetes, & epilepsy have the highest medical costs.	8,035 children	Asthma, epilepsy, hypertension, food allergies, diabetes	Mentioned by not defined	Poverty level, Medicaid, mother's education level
Palermo et al. (2008)	Quantitative: Survey from single medical center	M	Examination of the relationship between youth with SCD, SES, and SCD pain	Family SES distress is a significant predictor of functional disability levels	56 children	SCD	Mentioned but not defined	Parental education, male unemployment, high school dropout levels
Richardson et al. (2018)	Quantitative: Survey from national database	M	Examination of school absences for children with CKD	Children with CKD have higher absence rates, higher maternal education is associated with lower school absences	608 children	CKD	Absent more than 18 days per year	Maternal education level
Silverstein et al. (2001)	Quantitative: Survey from single school district	M	Examination of absences, academic achievement, grade promotion for children with asthma	Children with asthma had 2.21 absence days, no significant difference in academic achievement and grade promotion	92 children	Asthma	Number of days absent compared with control group	Parental education level, parental occupation
Telljohann et al. (2004)	Quantitative: Survey from single school district	E	Investigation of whether employing full time elementary school nurses can decrease asthma related school absences	Students who have access to full time nurses miss less school days than students with part time nurses	569 children	Asthma	7.6 days absent per year	Free/reduced lunch status

Article Characteristics					Participant Characteristics			
Study	***Design***	***Journal***	***Intervention***	***Results***	***n***	***Chronic illness***	***Chronic absenteeism***	***SES***
Wolfe (1985)	Quantitative: Survey from single state	M	Investigation of factors impacting academics for students with CI	Children who miss school do not perform as well as children who do not miss school	248 children	Various CHC	10 days of school absences per year	Parent education level and family income level
Ying-Ying et al. (2012)	Quantitative: Survey from single state	M	Examination whether the proportion of low-income students within a school is related to asthma school absences	Students who attend schools with the highest concentrations of low-income students were more likely to miss school due to asthma	1,276 children	Asthma	5 days or more of school absences per year	Free/reduced lunch status
Yoder (2020)	Literature review	E	Critique of research on the relationship between school nursing and student academic outcomes	School nurse interventions were associated with improved educational outcomes	N/A	Various CI	Reduction in absences in pre/post measure	Low income

Note. M=Medical Journal, E=Educational Journal, SCD=Sickle Cell Disease, CKD=Chronic Kidney Disease, CI=Chronic Illness, CHC=Chronic Health Conditions

Study Intervention and Results

All fourteen articles included within this review provide detailed examinations of factors that impact school attendance for students with various chronic health conditions. Findings from the articles indicate that students with chronic health conditions experience increased rates of school absences as compared to their peers. The results also show that factors associated with SES in combination with chronic health conditions impact school outcomes. Asthma, for example, is one of the most common chronic health conditions in children and causes the most illness-related school absences within the United States (Hsu et al., 2016). The Hsu et al. research also found relationships between school absences related to asthma and factors within the home environment, such as exposure to second-hand smoke and mold. Two articles (Telljohann et al., 2004; Yoder, 2020) investigated academic outcomes for students with chronic health conditions specifically with school nursing interventions. The findings within school nursing research detailed those students, especially students with asthma, who have access to school nurses on a full-time basis have better school attendance than students who have little nursing support at school.

Although results of included studies suggests children with chronic health conditions have increased school absences, the results are mixed on if significant school absences impact overall academic achievement, grade promotion, and graduation. Three articles (Crump et al., 2013; Fowler et al., 1985; Wolfe, 1985) describe decreased academic performances for students with chronic health conditions with chronic absenteeism. Students with medical conditions that have the potential to impact cognitive abilities (e.g., Spina Bifida and epilepsy) showed the greatest deficits within academic performance.

Professional Journals

Seventy-one percent of articles included in this review (*n*=10) were published in journals with a medical base. The audience for medical journal articles were physicians and other clinical care providers such as hospital-based nurses and social workers. Twenty-nine percent of included articles (*n*=4) were written with an education focus. Articles that were published within educational journals were written for professionals who are employed within the academic environment (e.g., school nurses, school administrators).

Participant Characteristics

Participant Descriptions

Students (*n*=43,052) with various chronic health conditions were studied in combination with SES to better understand the combined impact both have on school attendance. Chronic health conditions consisted of asthma, type 1 diabetes, kidney disorders, transplants, cancer, epilepsy, sickle cell anemia, pulmonary disorders, cardiac conditions, and other chronic illnesses. Asthma was listed as the most prevalent chronic illness researched regarding socioeconomic factors and school attendance. Most included articles (*n*=8, or 57%) investigated school absenteeism and socioeconomic status factors regarding students with asthma either as the single medical diagnosis or asthma in conjunction with other chronic health conditions. The number of participants with asthma included in the studies was 19,672 or 46% of total participants. Forty-three percent of included articles (*n*=6) reviewed socioeconomic characteristics and school attendance for students with various chronic health conditions (or than asthma).

Socioeconomic Factors

Socioeconomic factors were described within fourteen studies associated with students with various chronic health conditions. Fifty percent of included articles (*n*=7) used parental education levels as one of the factors that is associated with SES. According to Rindermann and Ceci (2018), parental education level and parental interest in their children's education could play a more important role for cognitive development of children than simply economic variables. Four articles (Clark et al., 1990; Emerson et al., 2016; Hsu et al., 2016; Miller et al., 2016) identified insurance (public vs. private) as the socioeconomic factor used in combination with school attendance and chronic health conditions. Three articles (Crump et al., 2013; Telljohann et al., 2004; Ying-Ying et al., 2012) identified enrollment within a school district's free and reduced lunch program as an SES factor for students with chronic health conditions. Finally, general factors of SES such as income factors and housing instability were key indicators impacting school attendance in Allen et al. (2018) and Yoder (2020) articles. Income factors in relation to SES determinants can be described as households earning below 185% of the federal poverty line (i.e., less than $44,863 for a family of four).

Characteristics of School Attendance

Fifty percent of included articles (*n*=7) listed specific measures for school absence characteristics. Specific absences measures, for example, were identified as being absent for 10% of the school year (or 18 total days) or by listing an absence average particular to the state in which the research occurred. Three articles (Clark et al., 1990; Crump et al., 2013; Silverstein et al., 2001) compared school absences rates for students with chronic health conditions against the general school population, such as comparing students with chronic health conditions across student populations who have not been identified with chronic illnesses. The Emerson et al. (2016) and Yoder (2020) and identified attendance rates as participant outcomes. In these two studies, student attendance was measured through pre and post intervention surveys. Specifically, improvement of attendance rates following intervention were measured.

Discussion

Due to the vast array of challenges that students with chronic health conditions encounter in accessing the education environment, the purpose of this literature review was to examine known research focusing on chronic health conditions, school attendance, in combination with factors associated with SES. By exploring the unique education characteristics associated with students with chronic illnesses, this review contributes to the field by examining fourteen articles that reviewed various pediatric health condition, SES, and school attendance. The following research questions guided our analysis: 1) What are the characteristics of articles that have examined interactions between chronic illness, chronic absenteeism, and poverty? 2) What are the characteristics of participants included in articles that have examined interactions between chronic illness, chronic absenteeism, and poverty?

Professional Journals

Findings of this review indicate that most of the published research (n=10) is directed towards medical personnel such as physicians and other healthcare providers. Physicians play an important role in addressing school concerns as pediatricians are often first at diagnosing childhood conditions that can potentially impact learning and social/emotional growth in children (Rey-Casserly et al., 2019). Because pediatricians complete ongoing and in-depth assessments of their patients, they are well-suited to collaborate with families and schools in addressing school attendance and education concerns (Rey-Casserly et al., 2019). Chronic health conditions impact education performance through loss of instruction time due to school absences as well as the decrease in social engagement (Shaw & McCabe, 2008). Articles focusing on the interaction between chronic health conditions and SES factors published in medical journals provide valuable information that physicians can translate into their own practices to benefit their patients.

Four articles included in this review were published in journals based in education research. Seventy-five percent of the education articles (n=3) were written within the context of school nurses as the audience. For example, the Yoder (2020) article, which is included in this review, is classified as a literature review. According to Yoder, the search terms that yielded the largest number of results consisted of the terms "school nurse" used in conjunction with different types of academic outcomes. One of the responsibilities of school nurses is to help families and schools identify common health conditions that impact education (Baisch et al., 2011). School nurses are responsible for developing individualized health care plans for students with chronic illnesses who need specialized health support within the school setting (Johnson, 2017). Because of the increased need of school nurse involvement within the development of health care plans that support students with chronic health conditions, it is reasonable to assume that many education articles should be directed at school nurses.

Due to advancements within medical care, the survival rate of many chronic health conditions, such as cancer and factors associated with prematurity, have greatly increased (Johnson, 2017). Today, more students with chronic health conditions can attend school with education and nursing supports. Although the prevalence of students with chronic health conditions who are attending school has risen, many classroom teachers still feel unprepared to provide adequate education supports to their students with complicated medical needs (Thompson et al., 2015). Results of this review suggest classroom teachers are not receiving sufficient information in the form of peer-reviewed research to support students with chronic health conditions. In addition, according to Maughan (2016), teacher preparation programs provide limited education and training regarding responsibilities of school nurses. Therefore, obstacles may exist between school nurses and schoolteachers concerning collaborative efforts to support students with complex medical needs.

The availability of school nurses may impact school attendance for students with chronic health conditions. Research surrounding school nurse employment (e.g., part-time or full-time nurses) such as the Telljohann et al. (2004) research, demonstrate school attendance differences for students with chronic health conditions. Students who attend schools that employ nurses full-time miss significantly less school days (M=10.6 days), than students who attend schools that employ part times nurses (M=13.0 days; Telljohann et al., 2004). Many benefits exist for students with chronic illnesses who attend schools with full-time nurses. Some of these benefits include school nurses providing patient education to students with chronic health conditions (Telljohann et al., 2004). Also, full-time school nurses have more opportunities to interact with students with chronic health conditions and have more time available to establish positive connections (Telljohann et al., 2004). The greater familiarity school nurses have with their students, the more

likely that student reentry programs can be individualized to maximize efficacy. Unfortunately, only 40% of public schools employ a full-time school nurse, 35% employ a part-time nurse, and 25% of school do not employ a school nurse at all (Willgerodt et al., 2018).

Asthma and School Outcomes

Asthma is one of most common pediatric chronic health conditions in the United States (Ying-Ying et al., 2012). The Ying-Ying et al.'s research denotes that approximately 9.6% (or 10.2 million) U.S. children have been diagnosed with asthma. School-aged children with asthma (ages 6-11) account for approximately 7 million missed school days in the United States (Sullivan et al, 2017). School absences are closely linked to decreased academic performance and an increase in the likelihood of dropping out of school prior to high school graduation (Ying-Ying et al., 2012). Students with asthma who have high rates of school absences may be at risk for poor education outcomes, which can include not completing high school.

Participants with asthma was the largest group included in this study. Fifty-seven percent of articles, or 19,672 participants were identified having asthma. Because of the high prevalence of asthma diagnosis in children, many of the articles included in this review focused on school factors that are associated with asthma. Key characteristics within the asthma-related articles detail the importance of good asthma control through medications, communications between stakeholders: families, medical providers and school, and the importance of school health plans in conjunction with school nursing input. Although asthma appears to be the largest chronic illness population studied, there are many other chronic conditions, such as cancer or traumatic brain injury, which significantly impact school attendance. According to Shaw and McCabe (2008), students who have been diagnosed with cancer may be absent from school upwards of 80 days per year, and students who have been diagnosed with a traumatic brain injury may miss approximately 46 days of school each year.

SES and Absenteeism Factors

Income is a factor that may impact high school graduation, with a higher proportion of lower income students exiting high school prior to graduation (Archambault et al., 2017). Using parental education is an acceptable SES variable, as there is a relationship between high school graduation and income. However, other articles used within this research identified other SES factors such as enrollment within the free/reduced lunch program or family income level. Different definitions regarding SES and school absence inclusion criteria may create difficulty in establishing consistency within the research.

School absence definitions also varied among the research. Fifty percent of the articles (n=7, n=11,852 participants) defined school absences by using an identified number of days missed per year. Clarity within school absences is important, as attendance is correlated to academic performance. Asthma was associated with decreased English/language arts and math performances, although the low academic performances may be attributed by absences (Van der Lee et al., 2007). Because of the differences in attendance definitions, there appears to be a need for normative guidelines to allow for consistency within the research.

Limitations

The findings of this review are not without limitations. First, database searches described in the methods section of this review, although extensive, may have not identified all relevant literature. Exclusion criteria eliminated studies that were conducted outside of the United States which may have resulted in excluding research with some bearing on the chronic health condition populations. The emphasis on included literature pertaining to students with chronic illness, school attendance, and poverty are justified given the alignment to this review's research questions. The authors also restricted our search to peer-reviewed publications which may have resulted in the unintentional exclusion of some articles. Because of the transparency within the search methodology, this review represents a first attempt at assessing the literature focused on students with chronic health conditions, school attendance, and poverty.

Second, due to the wide variety of illnesses that are classified at pediatric chronic health conditions, it is difficult to generalize academic and social outcomes for all children with chronic health conditions (Emerson et al., 2016). According to Emerson et al., academic generalization is difficult due to the variability in disease severity, length of illness, and diagnosis.

Third, many included studies (n=9) used data from either a single school district, medical center, or state. Although prevalence of students with chronic health conditions is low compared to the general school population, there is a significant need for practice standards within the education of children with chronic illnesses (Steinke et al., 2016). For example, the Steinke et al. research focused on medical facilities. Steinke et al. found that great variability within hospitals in terms of practice standards, services allocated to patients, and overall staffing. The inclusion of larger sample populations may help to broaden the research scope and improve education practices.

Implications

This review highlights several implications for the need for standardization of programming for students which chronic illness with associated factors of SES, and chronic school absences. Studies included in this review detailed those students with chronic health conditions are at risk for increased school absences. School attendance positively correlates to high school graduation, whereas chronic school absence adversely impacts school completion. Additional considerations should be allotted to students with chronic health conditions and low SES associated factors. Based on the findings of this review and from previous research we suggest:

1. Schools that implement comprehensive medical and education plans, such as the availability of full-time nursing support services, appear to help decrease school absences for student with chronic health conditions particularly with students who have asthma. Due to this finding, we suggest that schools work in conjunction with nursing and other medical care professionals to establish medical and educational plans that will positively improve outcomes for students with chronic health conditions.
2. Most of the published research describing school attendance for students with chronic health conditions with associated SES factors are published in medical journals. The literature published in education journals were targeted at school nurses and nursing plans of care. Previous literature, such as research from Irwin et al. (2018), illustrate that many educators feel unprepared to provide adequate education support to students with chronic health conditions. We suggest future researchers publish in education journals that are read by classroom teachers and school administrators to increase their knowledge and skills pertaining to supports and services for students with chronic health conditions.

Conclusion

Students with chronic health conditions with associated SES factors are at risk for poor school attendance, which will greatly impact their long-term health and academic outcomes. Through the implementation of medical care plans and other preventative measures, school nurses can help to positively improve school attendance for students with chronic health conditions and the American Academy of Pediatrics recommends that every U.S. school employ at least one full-time nurse (Allison et al., 2019). However, due to the variability within SES and attendance definitions, there is a need for standardization within the research to drive for optional outcomes for students with chronic health conditions. We encourage the field to continue exploring procedural standardizations between chronic school absences, SES factors, and students with chronic health conditions.

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