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Children with medical complexity and their reintegration into school following hospitalization: A scoping review protocol

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Abstract

Introduction

Returning to school is an important process for children who have experienced hospitalization. School attendance plays an integral role in children's social, emotional and intellectual development. A number of children that require hospitalization are unable to attend school each year. Yet, despite the known significance of schooling on child outcomes, and the additional support children who have experienced hospitalization might require, there remains a lack of consensus on the appropriate reintegration procedures and strategies into school programs for children following hospitalization. This scoping review aims to integrate all literature on what current implementations are in place, as well as assess stakeholders' perceived challenges related to reintegration of children following hospitalization.

Methods and Analysis

The current scoping review follows the five-stage framework proposed by Arksey and O'Malley (2005). The stages include (1) Identify the research question, (2) Identify relevant studies, (3) Study Selection, (4) Charting the data, (5) Collecting, summarizing and reporting the results.

Ethics and Dissemination

The current study utilizes available publications and does not collect primary data. Therefore, this study does not require ethics approval. The results of this scoping review will be prepared and submitted for publication in a peer-reviewed journal and presented at future conferences to key stakeholders focusing on educational accessibility and inclusion.

Strengths and Limitations of this Study

- Novel review approach covering content not yet explored in the literature
- The review will cover a comprehensive scope and timeline
- Numerous strategies will be applied to disseminate findings across key stakeholders
- The inclusion of articles will be published from English speaking journal articles

Background

Children's development is largely influenced by their environment[1,2] and globally, over one billion children spend the majority of their day attending either a primary or secondary school.[3] Therefore, investigating the experiences of children in school have important implications for research and policy. Research has shown that attending school leads to improved emotional regulation, development of prosocial behaviours, likely contributed by the opportunities for social and intellectual stimulation for the majority of children.[4] Time out of school, in contrast, has shown to have detrimental effects on children's mental health, wellbeing and educational outcomes.[4] Furthermore, children who are absent from school due to illness are at an increased risk of experiencing negative outcomes[5] and numerous studies have addressed the importance of the reintegration following hospitalization of children. However, research has disproportionately focused on the importance of and strategies towards reintegration to school for children with psychological disorders.[5,6] For example, Clemens and colleagues found that adolescents who required specific accommodations or modifications to schedules to perform optimally, faced stigma from peers and that these social challenges are best addressed proactively through the assignment of a school re-entry counsellor who can liaison the reintegration between hospital and school.[7] Yet, there is limited literature on the reintegration of children following hospitalization with acute or chronic illness and medically complex children, despite that they are more likely to experience reintegration of schooling.[5]

In 2018, there were 171,786 hospitalizations accounting for Canadians under the age of 18.[8] Of these children, there is a growing proportion who are characterized as children with medical complexity (CMC) who live with greater than one significant chronic health problem that, by definition, involves multiple organ systems resulting in multifaceted dysfunction, a

significant need for healthcare services.[9,10,11,12,13] Collectively, research suggests that CMC students' medical conditions cause them to miss greater than 15 days of school within one academic year.[5] Another classification of children at risk of pervasive hospitalization is children with chronic disease(s) diagnoses (CDDs). A major definition for CDDs is outlined by Wijlaars et al. as "any health problem requiring clinical follow-up for >12 months in 50% or more of cases."[14] Children with CDDs have almost a 35% increased risk of precarious social and academic development.[15] The origin of these risks that children with physical health conditions experience are distinct from children with developmental disabilities and merit separate investigation and solutions[16] as hospitalization and time absent from school has unique implications to children's psychosocial and socioemotional developmental outcomes.[17]

As mentioned, currently, there is a lack of national school reintegration programs or standards for children with physical health needs. There are multiple factors that have led to this gap in the literature. One reason may be more practical, such as the lack of provincial funding for such an initiative. Other factors though, shed light on the complexity of such an undertaking. The vast breadth of medical conditions and circumstances for which school-aged children might require hospitalization cannot be universally addressed in a singular program or protocol. A major priority for children who have faced a serious medical issue that required hospitalization is reintegration into the educational system. The physical and psychological effects of hospitalization will vary from student to student and do not contribute to reintegration challenges equally. For example, a child who was hospitalized once carries the burdensome trauma attached to that event as well as the challenge of learning all of the curriculum they missed during hospitalization. If the student is otherwise healthy, however, it is likely that the student will face further hospitalizations, making the re-integration the students' educational and health teams'

main priority. In children with chronic and recurring illness, there is added complexity in predicting future hospitalizations and re-integrations. While there is existing literature on the reintegration of students for certain hospitalizations, such as burns and cancer,[18.19] the currently literature does not encompass the range of children with CMC and CDD and their unique experience. These complexities also extend to academic supports and gauging whose responsibility it is to plan and execute this transition. An important tenet of school reintegration identified in the psychological literature is the executive coordination among all relevant medical and educational professionals providing support to children.[6,17,20]

There are many children with complex educational needs who have academic supports in place at some point and teaching staff who have the training to work with such students.[21] By contrast, a child with a physical illness, but no learning or intellectual disabilities, may return to their standard learning environment without the required resources to make their return seamless. Another explanation for the lack of a summative school reintegration program is that medical advances have outpaced the stakeholders involved in the design of such a program. Currently, over 80% of children with cancer will survive and the survival of certain individual cancers is far higher than that rate.[19] This was not always the case though, and so it is feasible that healthcare providers and educators did not invest in school reintegration due to the expectation that critically ill children would never return.[19] This failure negatively affects children's return to school which must be the primary priority for their post-hospitalization life.

While there have been efforts to design school reintegration programs at a local or individual level, their results and success have seldom been assessed cumulatively; a necessary step to delineate the evidence to inform a broader reintegration program. Canter et al. conducted

a systematic review in 2012 that assesses school re-entry in children with chronic illness, however, the final analysis only featured content on four medical conditions and 75% of the papers were solely focused on cancer.[19] To address this knowledge gap, our investigation will examine this by expanding the inclusion criteria. Further, research has shown that school reintegration has been oversaturated with the assessment of patients with cancer, burns, and other major causes of illness.[17,18,19] This has created a gap in the literature on school reintegration for patients with other, less-studied conditions. We hope to address the issue of lack of literature by conducting a thorough systematic review.

Methods and Analysis

Protocol Design

The current protocol was developed using the methodological framework proposed by Arksey and O'Malley (2005)[22] and further examined by Joanna Briggs Institute.[23]

Stage 1: Identify the research question

An environmental scan of the literature was conducted to inform our research questions. For the purpose of this review, we will only focus on children following discharge who reintegrate to their community school.

Based on the initial exploration of the literature, the following research questions were developed:

1. What are current practices of reintegration into the school setting of hospitalized children with CMC?
2. What are the reported barriers of reintegration into the school setting of hospitalized children with CMC?

3. Who is responsible for the reintegration planning and implementation process? Who are the key stakeholders?
4. Are parents involved in reintegration planning and/or implementation? What role do parents play?
5. Are children involved in reintegration planning and/or implementation? What role do children assume?

Stage 2: Search for Relevant Studies

Following Arksey and O'Malley's[22] framework, the second stage of the scoping review aimed to identify and develop inclusion criteria to be used when selecting studies for the review. These criteria helped inform the search syntax.

The scoping review will include published studies from the following databases: Medline, PsycInfo, Web of Science, Education Resource and ERIC. Reference lists of relevant studies will be checked to ensure that all applicable articles will be included.

Based on the initial exploratory research, the following eligibility criteria was implemented:

- Type of publication: journal articles
- Time frame: any
- Language: all
- Study population: children and adolescents, aged 4-18
- Types of articles: primary studies, systematic reviews, meta-analyses, scoping reviews, evidence maps, rapid reviews, literature reviews, evidence syntheses, reviews of reviews, narrative reviews and critical reviews
- Setting: children's community school

- Time Away from Hospital: Over two weeks[5]

An academic librarian was consulted and advised on the most appropriate subject heading terms and how to modify them across databases. The search syntax for each database was finalized and included the most frequently studied conditions such as "Juvenile", "Burns", "Neoplasms", "Arthritis", "Congenital", and "Hereditary" were included. Broader terms were applied to capture other conditions such as "Neonatal disease", "Abnormalities", "Exceptional", "Disease", "Disorder", "Serious illness", "Complex medical", "Chronic disease", "Multiple chronic conditions", "Medical complexity", "Surgery", "Traumatic", "Pediatric" and "Paediatric" were included. To search for the population, terms of the school context "High School", "Middle School", "Preschool", "Kindergarten", "Elementary School", "Nursing School", "Day care", "School" and "Education" were included. To include the relevant stakeholders such as "Doctor", "Physician", "Nurse", "Occupational Therapist", "Speech Therapist", "Speech Language Pathologist", "Teacher", "Principal", "Early Childhood Education", "Teaching Assistant", "Social Worker", "Psychologist", "Multidisciplinary", "Interdisciplinary", "Cross-professional", "Collaboration", "School Liaison", "Hospital Educator", "Child Life", "Parent", "Guardian", and "Caretaker". Finally, reintegration and transition terms such as "Re-entry", "Reintegration", "Transition", "Return to" and "Education" were included. Articles will then be retrieved from each database and imported into Covidence, the online systematic review, platform.

Stage 3: Selection of Relevant Studies

The third stage of Arksey and O'Malley's[22] framework aims to identify the selection of relevant studies. Following the consolidation of articles generated from the searches across databases, duplicates will be removed. Both members of the team will screen the titles and abstracts of all articles to determine which articles meet the eligibility criteria, identified in the second stage.

Following the abstract screening, full texts will be retrieved for full-text review. Disagreements about study eligibility will be discussed between the two reviewers until a consensus is reached. If a consensus is unable to be reached, a third party will be consulted. Study selection is reported using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses Scoping Review (ScR) flow chart taken from Tricco and colleagues (2018) and will be updated once each stage is complete.[24]

Stage 4: Charting the Data

Based on the preliminary investigation of the data there will be 16 categories that will be used from the literature when determining the inclusion of the articles (Table 1). For each article study descriptive information (i.e., title, author, journal and year of publications) and type of publications. Furthermore, participant characteristics will be collected. Information regarding the process and barriers to reintegration will be tabled. The framework will be pilot tested by two authors on a sample of the study to ensure coding is extracted consistently. If there are discrepancies, then the framework will be revised accordingly. Questions related to the extraction procedure will be discussed and disagreements will be resolved through team consultations.

Table 1
Variables to Chart

Main Category	Subcategory	Description
Authors		
Title		
Year		
Journal		
Country of Study		Country data collected from

Age Children	Mean age of Children	The arithmetic average of all children included in the study
	Minimum Age of Children	Age of youngest child
	Maximum Age of Children	Age of oldest child
	The age range of Children	Difference between oldest and youngest child
Number of Children		Total number of children included in the study
Grade of Child		School Grade of Children
School Type		What type of school child is attending (i.e. Community school, public school, private school)
Classroom Type		What type of classroom children were integrated into
Diagnosis of Children		A medical diagnosis of a child
Length of Diagnosis		How long the child has had the diagnosis
Reason for absence from school		The reason that child had to be away or postponed from attending school
Functional limitations and/or required accommodations upon reintegration into school		
Length of absence from school		Length of time child was removed from school
Integration Procedure		
	Professional facilitating integration	The professional members of the team responsible for the integration of the child (i.e. child-life, pediatrician, social worker)
	Length of integration	Length of time integration into school took place

	Process of integration	Procedure or process of integration
	Child involvement in integration	Child's role in their integration into school
	Parent/Caregiver involvement in integration	Parent/Caregiver's role in their child's integration into school
Outcome of Integration		
	Type of outcome investigated	What was the determinant of successful integration (i.e. child well-being, academic success)
	Description of outcome	The information provided on the outcome of integration as defined in the study
	Barriers to integration	Reported barriers to integration
	Key facilitators of integration	Key aspects that enhanced the success of integration into the school setting

Following training and reached an agreement by the team members, independent reviews of the articles and extraction will occur. To ensure inter-rater reliability, a sample of 20% of the articles will be double reviewed and discussion will occur between the two reviewers. Discrepancies in extracted data will be discussed and if consensus cannot be reached a third party will be included.

Stage 5: Summarizing the Results

Following the extraction of data, statistical and thematic analysis of results will be conducted to summarize the current literature pertaining to school reintegration among CMC. In particular, the common challenges within school reintegration and barriers to successful reintegration will be presented. Similarly, constituents of school reintegration following hospitalization and evidence-based protocols will be discussed and assessed per feasibility for implementation. Important

stratification of results (by age/grade, diagnosis, and school characteristics) will be performed to inform the suggestions for a protocol to ensure that their accuracy and efficacy are optimized for relevant stakeholders. Furthermore, the identification of effective tenets of reintegration will also expose domains that remain understudied, and merit continued investigation. The results will be presented through a combination of descriptive analysis, tables, charts, figures, and other visual tools as needed.

Patient and Public Involvement

No patients were involved in this study as it is solely the protocol for the scoping review. Experts in the field were involved in the development of research questions and outcomes, further to consultation with their interdisciplinary colleagues who work with patients and students with CMC and their families. In addition, they validated this as an area needing an amalgamation of evidence to inform their practice and service to this population, which this scoping review aims to provide. The authors plan to disseminate the results to patients and families by sharing the results with local pediatric hospitals, school-bridging program practitioners and pre-service educators. This scoping review is the first step to form a best practice guideline for school reintegration following hospitalization, an initiatives which will include patient and family partners in its formation and dissemination.

1.

Footnotes

Contributors: B-S contributed to developing the research questions, drafting and editing this protocol and substantially contributed to the development of the methods. K-D contributed to the conceptual framework, methods and edited the protocol. D-K contributed to the conceptual framework, methods and edited the protocol. S-C contributed to the development of the research questions and extensively drafted and edited the protocol. All authors have approved the final manuscript.

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Abstract

Introduction

Schools play a significant role in children's social, emotional, and intellectual well-being. For hospitalized children, an absence from school places them at risk for greater social exclusion and poorer academic outcomes than their healthy counterparts. Processes that support the school reintegration of children with medical conditions currently lack consistency and identified evidence-based practices. This scoping review aims to integrate the relevant literature on current reintegration protocols as well as assess stakeholders' perceived challenges related to the children's return to school following hospitalization. Finally, information will be synthesized regarding parental and child involvement in reintegration strategies.

Methods and Analysis

The current scoping review follows the five-stage framework proposed by Arksey and O'Malley (2005). The search syntax will be applied in Medline, Web of Science, PsycInfo, Education Resource, ERIC, CINAHL, and SocIndex. Journal articles will be included without the restriction of publication year or language. However, only children and adolescents aged 4-18 who have been out of school for two weeks and reintegrated into a non-hospital school setting will be included. Articles will be screened by two authors based on the outlined eligibility criteria. Data will be summarized qualitatively and where applicable, visualization techniques such as tables, graphs and figures will be implemented to address approaches, strategies, and outcomes related to re-integration to school following hospitalization.

Ethics and Dissemination

The current study comprises available publications and does not collect primary data. For this reason, ethics approval is not necessary. The results of this scoping review will be prepared and submitted for publication in a peer-reviewed journal and presented at future conferences to key stakeholders focusing on educational accessibility and inclusion.

Strengths and Limitations of this Study

- Novel comprehensive review approach covering content not yet explored in the literature
- The inclusion of articles will be published from English speaking journal articles
- This review is limited by the information shared by the authors in terms of barriers and facilitators of school reintegration programs

Background

Children's development and well-being are largely influenced by their environment[1,2] and globally, over one billion children spend the majority of their day attending either a primary or secondary school.[3] Therefore, investigating the experiences of children in schools has important implications for research and policy. Research has shown that attending school leads to improved emotional regulation, development of prosocial behaviours, likely contributed by the opportunities for social and intellectual stimulation for the majority of children.[4] Time out of school, in contrast, has shown to have detrimental effects on children's mental health, wellbeing and educational outcomes.[4] Furthermore, children who are absent from school due to illness are at an increased risk of experiencing negative outcomes.[5]

Numerous studies have addressed the importance of reintegration following hospitalization of children. For example, Clemens and colleagues found that adolescents who required specific accommodations or modifications to schedules to perform optimally, faced stigma from peers and that these social challenges are best addressed proactively through the assignment of a school re-entry counsellor who can liaison the reintegration between hospital and school.[6] Research has disproportionately focused on the importance of reintegration strategies for children with psychological disorders and a limited number of physical conditions, such as cancer, burn recovery, and traumatic/acquired brain injury.[6-11] Additional research attention is required with children who have an acute or chronic illness, and/or medical complexity because they are more likely to require adequate planning and supportive processes for school reintegration.[5]

In 2018, there were 171,786 hospitalizations accounting for Canadians under the age of 18.[12] Of these children, there is a growing proportion who are characterized as children with

medical complexity (CMC) who live with greater than one significant chronic health problem that, by definition, involves multiple organ systems resulting in multifaceted dysfunction, a significant need for healthcare services, and often, dependence on medical technologies.[13-19] Collectively, research suggests that CMC medical conditions cause them to miss greater than 15 days of school within one academic year.[5] Another classification of children at risk of pervasive hospitalization is children with chronic disease(s) diagnoses (CDDs). A major definition for CDDs is outlined by Wijlaars et al. as "any health problem requiring clinical follow-up for >12 months in 50% or more of cases."[20] Children with CDDs have almost a 35% increased risk of precarious social and academic development.[21] The origin of these risks that children with physical health conditions experience are distinct from children with developmental disabilities and merit separate investigation and solutions[22] as hospitalization and time absent from school has unique implications for children's psychosocial well-being and developmental outcomes.[23]

For example, CMC and CDD use medical technologies for their survival and health management. An important consideration for this population is the degree of self-management CMCs possess and to what extent educators and school administrators can be expected to play a role in the management of CMCs' ongoing health management needs. One study reviewed literature on CMC by applying The Pediatric Self-Management Model,[18, 24] which can be used to ascertain patients' ability to manage their own care needs through greater understanding of their condition(s). Important predictors for improved adjustment to new medical technologies were identified, such as whether families of CMC viewed the technology as a "puzzle" to solve versus a burden.[18] Given that most educators of CMC will not be trained to operate various medical technologies, this research highlights the importance of having school reintegration plans that are

tailored to each student's needs and circumstances. These plans should consider the level of ongoing care management and the degree to which the child can handle their care independently.

A preliminary scoping review helped identify relevant variables in the assessment of hospital-to-home transition for CMC.[19] The investigators elected to assess stakeholder perceptions on the usefulness of transition plans since while there are numerous benefits of transition of care plans, it is possible that stakeholders find them less effective in the CMC population given the regularity and unpredictability of re-hospitalization. An important finding from this scoping review was that all included studies concluded that transition of care plans are useful in optimizing communications between caregivers and healthcare providers.[19] Next steps could include determining if the purported improved communication extends to involved educators in this study.

The impetus for this scoping review is based on a lack of national school reintegration programs or standards for CMC. There are potentially many reasons for this discrepancy. One reason may be more practical, such as the lack of provincial funding for such an initiative. Other factors though, shed light on the complexity of such an undertaking. The range of medical conditions and circumstances for which school-aged children might require hospitalization cannot be universally addressed in a singular program or protocol. A major priority for children who have been hospitalized for an extensive period of time is a successful school reintegration. The physical and psychological effects of hospitalization will vary from child to child creating individual challenges to reintegration. For example, a child who was hospitalized once carries the burdensome trauma attached to that event as well as the challenge of learning all of the curricula they missed during hospitalization. Nevertheless, if such a student is otherwise healthy, it is unlikely that the student will face further hospitalizations. In this case, school re-integration

will likely be a top priority for the student's educational and health teams and be a more straight-forward process. In children with chronic and recurring illnesses though, there is added complexity in predicting future hospitalizations and re-integrations as well as the additive trauma and growing disruptions to a child's education from serial hospitalizations. Previous research has demonstrated that CMC are frequently hospitalized. In fact, some research has suggested that the thirty-day hospital readmission rate for CMC was nearly 24%.[19] This further supports the aims of this scoping review which will inform school reintegration protocols for this unique population.

While there is existing literature on the reintegration of students for certain hospitalizations, such as burns and cancer,[9,10] the current literature does not encompass the range of CMC and CDD and their unique experience. These complexities also extend to academic support and gauging who is responsible for planning and executing the transition. An important tenet of school reintegration identified in the psychological literature is the executive coordination among all relevant medical and educational professionals providing support to children.[6,8,23]

Some children with complex educational needs have academic supports in place involving teaching staff who have the training to work with such students.[25] By contrast, a child with a physical illness, but no learning or intellectual disabilities, may return to their standard learning environment without the required resources to make their return seamless. Another explanation for the lack of a comprehensive school reintegration program is that medical advances have outpaced the stakeholders involved in the design of such a program. Currently, over 80% of children with cancer will survive and the survival of certain individual cancers is far higher than that rate.[10] In the past, it may have been feasible for healthcare providers and educators to ignore the relevance of school integration when many critically ill children did not

survive.[10] For this reason, it is timely to advocate for best practices that support children's lives post-hospitalization.

While there have been efforts to design school reintegration programs at a local or individual level, their results and success have seldom been assessed cumulatively; a necessary step to delineate the evidence to inform a broader reintegration program. Canter et al. conducted a systematic review in 2012 to assess school re-entry in children with chronic illness. However, the final analysis only featured content on four medical conditions and 75% of the papers were solely focused on cancer.[10] Other research has shown that school reintegration has been oversaturated with the assessment of patients with cancer, burns, and other major causes of illness.[9-11,23] This has created a notable gap in the literature on school reintegration for patients with other, less-studied conditions, such as CMC. To address this knowledge gap, our investigation will examine this by expanding the inclusion criteria with a focus on CMC.

Methods and Analysis

Protocol Design

The current protocol was developed using the methodological framework proposed by Arksey and O'Malley (2005)[26] and further examined by Joanna Briggs Institute.[27] In addition, this protocol follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review (PRISMA ScR; Appendix A). The study search will be conducted in September 2021 and the project is expected to be completed in March 2022.

Stage 1: Identify the research question

An environmental scan of the literature was conducted to inform our research questions. For the purpose of this review, we will focus on children (4-18 years) following discharge who reintegrate into an out-of-hospital school setting.

Based on the initial exploration of the literature, the following research questions were developed:

1. What are current practices of reintegration into the school setting of hospitalized children with CMC? When are these practices typically applied (i.e. before and/or during hospitalization)? Which practices have been effective in CMC if any?
2. How is school reintegration planned and what steps are taken to optimize the execution of school reintegration plans? How do stakeholders manage follow-up of reintegration plans?
3. What are the reported barriers to reintegration into the school setting of hospitalized children with CMC?
4. Who is responsible for the reintegration planning and implementation process? Who are the key stakeholders?
5. Are parents involved in reintegration planning and/or implementation? What role do parents play?
6. Are children involved in reintegration planning and/or implementation? What role do children assume? Based on a child's right to participate in decisions, how are they involved in the planning, execution and follow up stages?

Stage 2: Search for Relevant Studies

Following Arksey and O'Malley's[26] framework, the second stage of the scoping review aimed to identify and develop inclusion criteria to be used when selecting studies for the review. These criteria helped inform the search syntax.

The scoping review will include published studies from the following databases: Medline, PsycInfo, Web of Science, Education Resource, ERIC, CINAHL and SocIndex. Reference lists of relevant studies will be checked to ensure that all applicable articles will be included.

Based on the initial exploratory research, the following eligibility criteria were implemented:

- Type of publication: journal articles
- Publication year: any
- Language: all
- Study population: children and adolescents, aged 4-18 years
- Types of articles: primary studies, systematic reviews, meta-analyses, scoping reviews, evidence maps, rapid reviews, literature reviews, evidence syntheses, reviews of reviews, narrative reviews and critical reviews
- Setting: out-of-hospital school settings
- Time Away from Hospital: Over two weeks[5]

An academic librarian trained in review strategies was consulted regarding the most appropriate subject heading terms and how to modify them across databases. The search syntax for each database was finalized and included terms concerning the most frequently studied

medical conditions such as, “Juvenile”, “Burns”, “Neoplasms”, “Arthritis”, “Congenital”, and “Hereditary.” Broader terms were applied to capture other conditions such as, “Neonatal disease”, “Abnormalities”, “Exceptional”, “Disease”, “Disorder”, “Serious illness”, “Complex medical”, “Chronic disease”, “Multiple chronic conditions”, “Medical complexity”, “Surgery”, “Traumatic”, “Pediatric” and “Paediatric” were included. To search for the study population, the terms “High School”, “Middle School”, “Preschool”, “Kindergarten”, “Elementary School”, “Nursing School”, “Day care”, “School” and “Education” were included. To search for research involving key stakeholders in school reintegration for CMC, the terms “Student”, “Patient”, “Doctor”, “Physician”, “Nurse”, “Occupational Therapist”, “Speech Therapist”, “Speech Language Pathologist”, “Child and Youth Workers”, “Teacher”, “Principal”, “Early Childhood Educator”, “Teaching Assistant”, “Social Worker”, “Psychologist”, “Multidisciplinary”, “Interdisciplinary”, “Cross-professional”, “Collaboration”, “School Liaison”, “Hospital Educator”, “Child Life”, “School Nurse”, “Parent”, “Guardian”, and “Caretaker” were included. Finally, reintegration and transition terms such as, “Re-entry”, “Reintegration”, “Transition”, “Return to” and “Education” were included. Articles will then be retrieved from each database and imported into Covidence, the online systematic review platform. An example of the search syntax for re-integration and the stakeholders applied in the database Medline please see Appendix B and Appendix C, respectively.

Stage 3: Selection of Relevant Studies

The third stage of Arksey and O’Malley’s[26] framework aims to identify the selection of relevant studies. Following the consolidation of articles generated from the searches across databases, duplicates will be removed. Two members of the team (SB, CS) will independently screen the titles and abstracts of all articles to determine which articles meet the eligibility

criteria devised in the second stage. Following the abstract screening, full texts will be retrieved for full-text review. Disagreements about study eligibility will be discussed between the two reviewers until a consensus is reached. If a consensus is unable to be reached, a third party will be consulted (DK, KD). Study selection is reported using a PRISMA ScR flow chart taken from Tricco and colleagues (2018) and will be updated once each stage is complete.[28]

Stage 4: Charting the Data

Based on the preliminary investigation of the data, 16 categories have been identified that will be used for the literature screening when determining the inclusion of the articles (Table 1). For each article, descriptive information (i.e., title, author, journal, and year of publication) and type of publication will be extracted independently by two authors (SB, CS). Furthermore, participant characteristics will be collected. Information regarding the process and barriers to reintegration will be tabled. The framework will be pilot tested by two authors on a sample of the study to ensure coding is extracted consistently. If there are discrepancies, then the framework will be revised accordingly. Questions related to the extraction procedure will be discussed and disagreements will be resolved through team consultations.

Table 1.

Variables to Chart

Main Category	Subcategory	Description
Authors		
Title		
Year		
Journal		
Country		Country data collected from in the study
Age Children	Mean age	The arithmetic average of all children included
	The age range	Difference between oldest and youngest child
Number of Children		Total number of children included in the study
Grade		School Grade of Children
School Type		Type of school child is attending (i.e. out-of-hospital school, public school, private school)
Classroom Type		Type of classroom children were integrated into
Diagnosis		The medical diagnosis of a child
Length of Diagnosis		How long the child has had the diagnosis
Reason for absence		The reason that child had to be away or postponed from attending school
Limitations/ Accommodation		Functional limitations and/or required accommodations upon reintegration into school
Length of absence	Length of hospitalization	Length of time child was removed from school
	Length between hospital and school	Length of time between hospitalization and reintegration (i.e. time spent at home and details pertaining to homebound instruction if pertinent to the student's reintegration plan)

	Number of hospitalizations	Number of hospitalizations a student has experienced (or is anticipated to experience) over the past academic year causing absence from school for two weeks or longer each time
Integration Procedure	Professional facilitating integration	The professional members of the team responsible for the integration of the child (i.e. child-life, pediatrician, social worker)
	Length of integration	Length of time integration into school took place
	Process of integration	Procedure or process of integration (i.e. planned before or implemented during hospitalization)
	Child involvement	Child's role in their integration into school and steps taken to ensure a patient-centred approach
	Parent/Caregiver involvement	Parent/Caregiver's role in their child's integration into school
	Re-integration Plan	Details on accommodations implemented to support school re-integration including if the plan address all accommodation needs and if the plan involved the use of interactive technologies (i.e. robots, tele-education, etc…)
Outcome of Integration	Type of outcome investigated	Determinant(s) of successful integration (i.e. child well-being, academic success)
	Description of outcome	The information provided on the outcome of integration as defined in the study
	Barriers to integration	Reported barriers to integration
	Key facilitators of integration	Key aspects that enhanced the success of integration into the school setting including incorporating student perspectives into the reintegration plan

Following training and agreement by the team members, independent reviews of the articles and extraction will occur. To ensure inter-rater reliability, a sample of 20% of the articles will be double reviewed and discussion will occur between the two reviewers. Discrepancies in

extracted data will be discussed and if consensus cannot be reached a third party will be included.

Stage 5: Summarizing the Results

Following the extraction of data, statistical and thematic analysis of results will be conducted to summarize the current literature pertaining to school reintegration among CMC. In particular, the common challenges within school reintegration and barriers to successful reintegration will be presented. Similarly, constituents of school reintegration following hospitalization and evidence-based protocols will be discussed and assessed per feasibility for implementation. Important stratification of results (by age/grade, diagnosis, and school characteristics) will be performed to ensure that the suggestions for reintegration guidelines are accurate and effective. Furthermore, the identification of effective tenets of reintegration will also expose domains that remain understudied, and merit continued investigation. The results will be presented through a combination of descriptive analysis, tables, charts, figures, and other visual tools as needed.

Ethics and Dissemination

The current study comprises available publications and does not collect primary data. Therefore, this study does not require formal ethics approval from the Research Ethics Board. The results of this scoping review will be prepared and submitted for publication in a peer-reviewed journal for readership by key stakeholders (e.g., patients, parents, teachers, physicians, social workers, child and youth workers, nurses, child life specialists, and speech language pathologists) and presented at future conferences focusing on educational accessibility and inclusion of CMC. Furthermore, this scoping review will form the basis of identifying evidence-based practice for school reintegration and policy and future research initiatives.

Patient and Public Involvement

No patients were involved in the preparation of this scoping review protocol but will be engaged during future stages of this research. Experts in the field were involved in the development of research questions and outcomes, further to consultation with their interdisciplinary colleagues who work with CMC and their families. To ensure patient and family perspectives are highlighted, we have included child and family involvement in reintegration plan formation. The authors plan to disseminate the results to patients and families by sharing the results with local pediatric hospitals, school authorities, public and private schools that serve CMC, school bridging program practitioners and preservice educators. This scoping review is the first step to form a best practice guideline for school reintegration following hospitalization.

Footnotes

Contributors: B-S contributed to the development of the research questions, drafting, and editing this protocol and substantially contributed to the development of the methods. K-D contributed to the conceptual framework, methods and edited the protocol. D-K contributed to the conceptual framework, methods and edited the protocol. S-C contributed to the development of the research questions and extensively drafted and edited the protocol. All authors have approved the final manuscript.

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Competing interests: None declared.

Provenance and peer review: Not commissioned; externally peer-reviewed

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Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4-8
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	8
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	n/a
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	10
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	10
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	21
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	11
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	12
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	13-14
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	n/a

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	15
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	n/a
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	n/a
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	n/a
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	n/a
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	n/a
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	n/a
Limitations	20	Discuss the limitations of the scoping review process.	n/a
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	n/a
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	17

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

Database [Platform] *Searches run August 17, 2021*	**Results**
MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily [OVID] 1946 to August 16, 2021	498
APA PsycInfo [OVID] 1806 to	
Web of Science [Clarivate Analytics]	
Education Resource [EBSCO]	
ERIC [Proquest]	
TOTAL	

MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily 1946 to August 16, 2021
Search Strategy:

#	Searches	Results
1	Arthritis, Juvenile/	10778
2	exp Burns/	59064
3	chronic disease/ or multiple chronic conditions/	270475
4	exp Neoplasms/	3518764
5	"congenital, hereditary, and neonatal diseases and abnormalities"/	890
6	Critical Illness/	32905
7	exp Specialties, Surgical/	207041
8	(arthritis adj5 (juvenile or child* or adolescen*)).tw,kf.	12950
9	(burn? or cancer* or neoplasm? or sarcoma? or tumor? or tumour? or complex medical* or medical* complex* or hereditary or congenital).tw,kf.	3555399
10	(burn? or cancer* or neoplasm? or sarcoma? or tumor? or tumour? or complex medical* or medical* complex* or hereditary or congenital or abnormal* or exceptional* or juvenile).tw,kf.	4276266
11	(chronic* adj5 (condition? or disease? or disorder? or ill* or sick*)).tw,kf.	423127
12	(critical* adj5 (condition? or disease? or disorder? or ill* or sick* or injur*)).tw,kf.	87064
13	(critical* adj5 (condition? or disease? or disorder? or ill* or sick* or injur*)).tw,kf.	87064
14	or/1-13	6290763
15	exp child/ or exp "congenital, hereditary, and neonatal diseases and abnormalities"/ or exp infant/ or adolescent/ or exp pediatrics/ or child, abandoned/ or exp child,	5338148

	exceptional/ or child, orphaned/ or child, unwanted/ or minors/ or (pediatric* or paediatric* or child* or newborn* or congenital* or infan* or baby or babies or neonat* or pre-term or preterm* or premature birth* or NICU or preschool* or pre-school* or kindergarten* or kindergarden* or elementary school* or primary school* or nursery school* or (day care* not adult*) or schoolchild* or toddler* or boy or boys or girl* or middle school* or pubescen* or juvenile* or teen* or youth* or high school* or adolesc* or pre-pubesc* or prepubesc*).mp. or (child* or adolesc* or pediat* or paediat*).jn.	
16	Return to School/	23
17	Schools/ and (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*).mp.	1514
18	Education/ and (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*).mp.	638
19	(school* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	3334
20	(highschool* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	2
21	(preschool* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	91
22	(education* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	2103
23	or/16-22	6556
24	14 and 15 and 23	498

MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily 1946 to August 16, 2021

Search Strategy:

#	Searches	Results
1	schools/ or schools, nursery/	44209
2	Education/	21321
3	(school? or highschool? or preschool? or day care? or kindergarten or kindergarden or education).tw,kf.	774507
4	or/1-3	789166
5	exp Physicians/	154204
6	exp Nurses/	91988
7	Occupational Therapists/	428
8	School Teachers/	1942
9	parents/ or fathers/ or mothers/ or single parent/	121198
10	legal guardians/ or proxy/	3773
11	Caregivers/	41312
12	Social Workers/	801
13	(doctor? or physician? or nurse? or occupational therapist? or speech language therapist? or speech language pathologist? or teacher? or school principal? or highschool principal? or "early childhood educator?" or "early child hood educator?* or teaching assistant? or social worker?" or psychologist? or school liaison? or hospital educator? or child life or parent* or mother? or father? or mom* or dad* or stepparent? or caretaker? or caregiver? or guardian?).tw,kf.	1619299
14	or/5-13	1762482
15	Return to School/	23
16	Schools/ and (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*).mp.	1514
17	(school* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	3334

18	(highschool* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	2
19	(preschool* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	91
20	(education* adj5 (re-enter* or re-entr* or reenter* or reentry* or return* or reintegrat* or re-integrat* or transition*)).tw,kf.	2103
21	or/15-20	6071
22	**4 and 14 and 21**	**2408**
23	exp Child/	1996938
24	Adolescent/	2114511
25	exp Pediatrics/	60718
26	(pediatric* or paediatric* or child* or toddler* or boy or boys or girl* or pubescen* or juvenile* or teen* or youth* or adolesc* or pre-pubesc* or prepubesc*).mp. or (child* or adolesc* or pediat* or paediat*).jn.	3944504
27	or/24-26	3947615
28	**4 and 14 and 21 and 27**	**1658**