
PROTOCOL FOR A SCOPING REVIEW OF SCHOOL-BASED OCCUPATIONAL THERAPY INTERVENTIONS

ADMINISTRATIVE INFORMATION

1. Title:

School-based Occupational Therapy interventions for children with Special Educational Needs or disabilities: protocol for a scoping review of a complex intervention¹

2. Registration:

This protocol will be published in ORE Open Research Exeter by the College of Social Sciences and International Studies (SSIS).

3. Authors:

Corresponding author: Javiera Salazar Rivera, js1003@exeter.ac.uk College of Social Sciences and International Studies, Graduate School of Education, University of Exeter. St Luke's Campus, Heavitree Road, Exeter, Devon, EX1 2LU, UK.

Nouf Alsaadi, na453@exeter.ac.uk. College of Social Sciences and International Studies, Graduate School of Education, University of Exeter.

Dr. Christopher Boyle, c.boyle2@exeter.ac.uk. College of Social Sciences and International Studies, Graduate School of Education, University of Exeter.

Dr. Christopher Morris, christopher.morris@exeter.ac.uk. College of Medicine and Health, University of Exeter.

Contributions:

JS drafted the manuscript, develop the selection and data extraction criteria and forms, and create the search strategy. CM and CB provided methodological and content expertise advice. All the authors read, provided feedback and approved the final manuscript.

4. Amendments: Not applicable

¹ This protocol has been developed by considering the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols PRISMA-P(Shamseer et al., 2015), but adapted based on the PRISMA extension for scoping reviews PRISMA-ScR(Tricco et al., 2018) and on the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for complex interventions PRISMA-CI(Guise et al., 2017).

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INTRODUCTION

6. Rationale:

In school-based Occupational Therapy (OT) practice, there is a call to shift from the traditional pull-out service delivery system towards more inclusive practices (Bissell & Cermak, 2015; Cahill & Lopez-Reyna, 2013; Garfinkel & Seruya, 2018). In fact, scholars such as Stephenson (2019) have claimed that being able to adapt and change OT services to take account of contemporary issues is crucial to the profession's survival and growth. However, in order to address this claim, we believe that more comprehensive knowledge about what Occupational Therapists (OTs) are actually doing in school settings is required.

Research suggests that OTs are mainly included in school teams when the performance or participation of students with Special Educational Needs (SEN) or disabilities is at risk. In fact, empirical evidence indicates that the participation of these students can be restricted compared with their typically developing peers (Bedell et al., 2005; Coster et al., 2013; Eriksson et al., 2007). However, the school-based OT practice is complex because of the considerable variability in service provision, including a diversity of targets, places, types and service schedules (Bazyk & Cahill, 2015). In practice, this means that OTs provide services that support diverse conditions and students, and that are delivered in different ways. In consideration of these variations, this review will explore the ingredients of school-based OT interventions and will map these interventions by using the Response to Intervention Model (RtI). This model has been selected because tiered models have been described as those that offer best guidance in ensuring that the level of support provided is needs-based and reach all people (WFOT, 2016). RtI also allows OTs to offer valuable strategies along the tiered continuum-support that includes specialist (intensive), targeted and universal interventions (AOTA, 2012; Bissell & Cermak, 2015).

A student's occupational (educational) performance or participation may be impacted by a physical, developmental, sensory, attentional and/or learning challenge. Along with the availability of support, the social, attitudinal and cultural environment also impact the student's occupational performance and participation (Whalen, 2003). This scoping review will analyse

the support provided to improve these two aspects of children categorised as having SEN, which compromise a variety of conditions. According to research evaluating school-based OT for children with SEN/disabilities, this range of conditions could include (Arbesman et al., 2013; Beck et al., 2006; Benson et al., 2016; Cahill & Lopez-Reyna, 2013; Nye & Sood, 2018; Piller & Torrez, 2019; Rosenberg et al., 2017; Spencer et al., 2006; Zingerevich, 2009):

1. Perceptual (vision, hearing) or communicative (e.g. Autistic Spectrum Disorder, dysphasia, language disorders) disabilities or difficulties
2. Neurological impairment (e.g. Cerebral Palsy)
3. Sensory challenges or difficulties (e.g. sensorial defensiveness)
4. Physical problems or disabilities (e.g. Developmental Coordination Disorder)
5. Cognitive and executive functioning difficulties (e.g. written productivity, intellectual or learning disabilities, Attention Deficit Hyperactive Disorder)
6. Social participation issues and/or mental health problems

In terms of school-based OT interventions, the evidence shows that OTs mostly provide direct one-to-one support in pull-out (outside the classroom) and push-in (inside the classroom) service models (Bolton & Plattner, 2019). These patterns have been reported mostly for students with difficulties in fine motor classroom skills, in handwriting, in sensory processing, and those with behavioural concerns. This matches with former studies that identified that OT services were focused mainly on changing the child by remediating sensory or motor problems, deploying mainly pull-out direct services (Beck et al., 2006; Spencer et al., 2006). Rodrigues & Seruya (2019) also found that a direct pull-out model was the most frequent service provided in middle schools, where handwriting, fine motor skills and executive function skills were the most common areas supported. With regards to handwriting and motor skills interventions, evidence indicates significant and positive outcomes after providing a handwriting readiness programme in a classroom with 4 and 5 year olds (Lust & Donica, 2011) and a gross motor skill programme in universal support in a classroom with 3 to 5 years old (Bellows et al., 2013). Ohi et al., (2013) addressed fine motor and visual skills in a kindergarten classroom and found that the intervention group showed a statistically significant increase in these skills while the control group demonstrated a slight decline in these two areas. Dreiling & Bundy (2003) conducted a study to compare the outcomes for pre-schoolers with motor delays, who were served through either direct-indirect intervention or consultation to parents and preschool staff. They found that these two service delivery models helped the students to meet the expected goals, and a t test for independent samples showed no

statistically significant differences between the two groups, which was supported by a small effect size. Nevertheless, these authors described that the advantage of a consultation provision was that school staff and parents were empowered to support children in their daily routine.

It is expected that our scoping review will provide crucial information for OT practitioners, allowing them to consider and reflect on current claims and their practice patterns. In addition, the analysis of ingredients and the classification of these interventions according to the Rtl model will allow researchers, policy makers and the educational community to understand in a better way the roles and contributions of OTs in education, issues that have been reported as main problems in school practice (Chu, 2017; Hutton, 2008).

7. Objectives:

The aim of this scoping review is to systematically map published research evaluating school-based OT interventions in order to obtain a complete picture of the research which has been carried out. This will be made by using three of the elements of the PICO Format:

Participants → children with SEN/disabilities

Intervention → school-based OT

Outcomes → occupational (educational) performance and school participation.

In terms of the OT school-based interventions, the primary interest of the sources of complexity in this review will be their multiple components and their interactions with study participants and context. Therefore, there will be an emphasis in exploring intervention's ingredients and contextual characteristics.

The research questions/objectives of this review and proposed methods to address them are summarised in Table 1.

Questions	Research procedures
1. What is known from scientific studies about school-based OT interventions for children with SEN/disabilities?	Map the research done in the area of school-based OT interventions to improve the occupational performance and school participation of children with SEN/disabilities
2. What school-based OT interventions have been described in scientific studies?	Map the interventions that scientific studies describe as school-based OT services

3. What the ingredients are of school-based OT interventions described in scientific studies?	Unpack the ingredients of the school-based OT interventions that have been studied.
4. How can the school-based OT interventions described in scientific studies be classified in the three tiers of support of the Rtl model?	Classify the studied school-based OT interventions in specialist, targeted and universal tiers of support, according with their ingredients

Table 1 Research questions and proposed methods

In addition, this review will evaluate the feasibility of undertaking a comprehensive systematic review of this topic or any particular intervention, by determining the number of publications available on the effectiveness of school-based OT interventions.

METHODS

8. Eligibility criteria:

Study design: This scoping review will embrace the widest feasible scope in terms of evaluative study design, including randomized control trials, non-randomized control trials, pilot studies, and case studies from journal articles, master and doctorate dissertations and theses. This decision was taken primarily to answer the first and second questions of this review

Participants: scope is children from 3 to 16 years old who are supported by school-based OTs. There will be no restrictions in terms of diagnoses, SEN, difficulties or disabilities. It is important to mention that in some contexts, children from 3 to 5 years old are not in schools. However, it was relevant to include these ages in the review since the role of OTs in schools is closely associated with the readiness for learning and transition periods. Studies that include these participants and others, such as students from 0 to 18 or 21, will also be included but considering the data of students from 3 to 16 years old only.

Interventions: any type of school-based OT, including specialist, targeted and universal interventions that tackle any diagnostic, condition or difficulty. These can be provided by OTs themselves or by OT Assistants (OTAs). OTAs deliver occupational therapy services under the supervision of and in partnership with OTs.

According to the Position Statement for OT services in school-based practice for children and youth by the World Federation of OTs (WFOT, 2016), OT interventions can be delivered in any of the three levels of the support-continuum described in tiered intervention models such

as RtI and Partnering for Change (Missiuna et al., 2012). Therefore, this review will include interventions in the following levels of support:

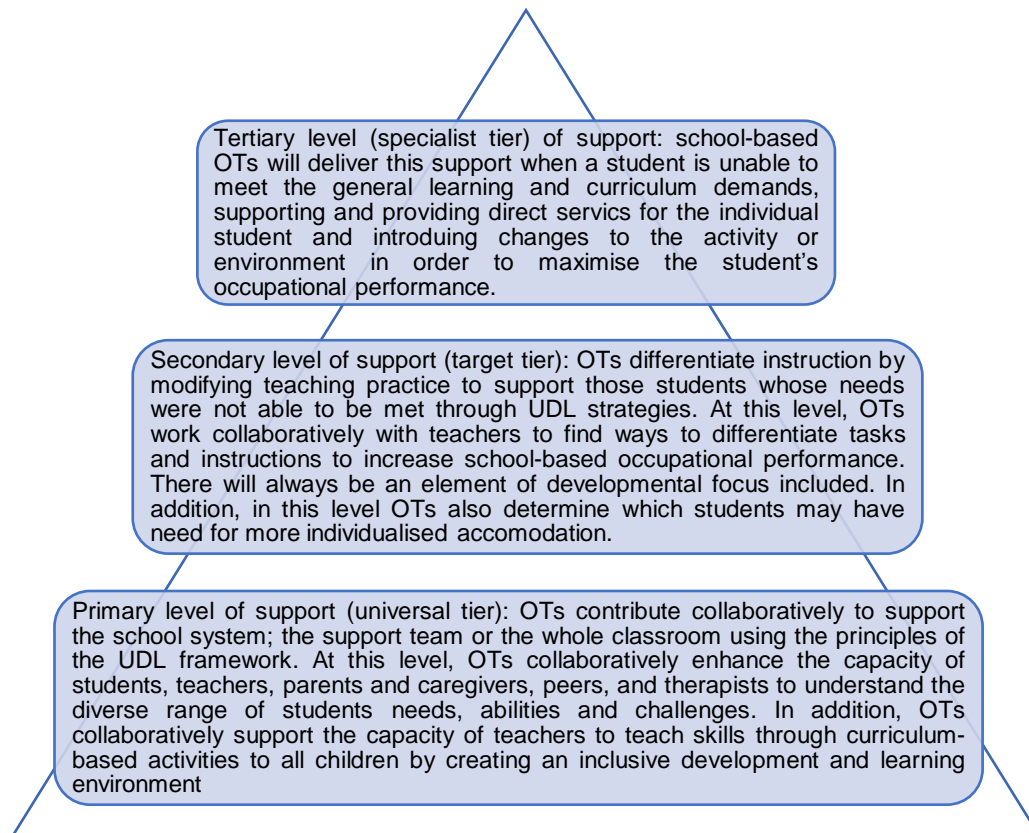


Figure 1 Tiers of support (RtI model)

It is important to mention that commonly, the studies of school-based OT provision do not name their intervention tier. However, the characteristics of the interventions themselves allow for their classification in one of these tiers of support, or they span through the three layers.

Studies that analyse OT school-based interventions in conjunction with other types of interventions, such as those provided by physiotherapists or speech and language therapists, will be also included but considering the data of OT interventions only. If more than one study analyses the same intervention but with different participants or in different schools, this study will also be included.

Outcomes: In OT, the outcomes are the end result of the therapy process, and can be linked to (AOTA, 2014):

1. Occupational performance (the act of doing and accomplishing a selected action, activity, or occupation, and results from the dynamic transaction between the person, the context, and the activity)
2. Prevention (promotion of healthy lifestyle)
3. health and wellness (state of mental and physical balance and fitness)
4. Quality of life (dynamic appraisal of the person's life satisfaction, hope, self-concept, health and functioning, and socioeconomic factors)
5. Participation (involvement in a life situation)
6. Role competence (ability to effectively meet the demands of roles in which the person engages)
7. Well-being (contentment with one's health, self-esteem, sense of belonging, security and opportunities for self-determination, meaning, roles and helping others)
8. Occupational justice (access to and participation in the full range of meaningful and enriching occupations afforded to others)

The types of outcomes that this review will analyse are difficult to establish mainly because in school practice, there has been an absence of a direct link to measurable OT outcomes since common high-stakes curriculum-based assessments used to track student's progress and achievement do not often link to the outcomes of OT interventions (Argabrite, 2013). As a result of this, OTs have relied on professional tools and resources to create their own accountability systems, a process that in practice is guided commonly by the achievement of specific goals stated in individual plans (Schaaf & Imperatore Blanche, 2012)

For this review in particular, the OT Practice Framework (AOTA, 2014), the work of Bazyk & Cahill (2015), and the example of a school-based OT logic model developed by (Letts et al., 1999) were analysed carefully in order to establish outcomes that will span the eight outcomes for OT and organise them into three main categories (see the next diagram).

However, this review will include studies that aim to improve or enhance a child's occupational (educational) performance and participation in formal education activities since for the OT' profession, a good occupational performance leads to an improved school participation and consequently to a better state of health (AOTA, 2014). With regards to formal education activities, these are defined as academic (math, reading, writing) and non-academic activities (recess, lunchroom, hallway, extracurricular/sports, band, cheerleading,

dances, and vocational/prevocational and vocational activities) with which any student engage during a school day.

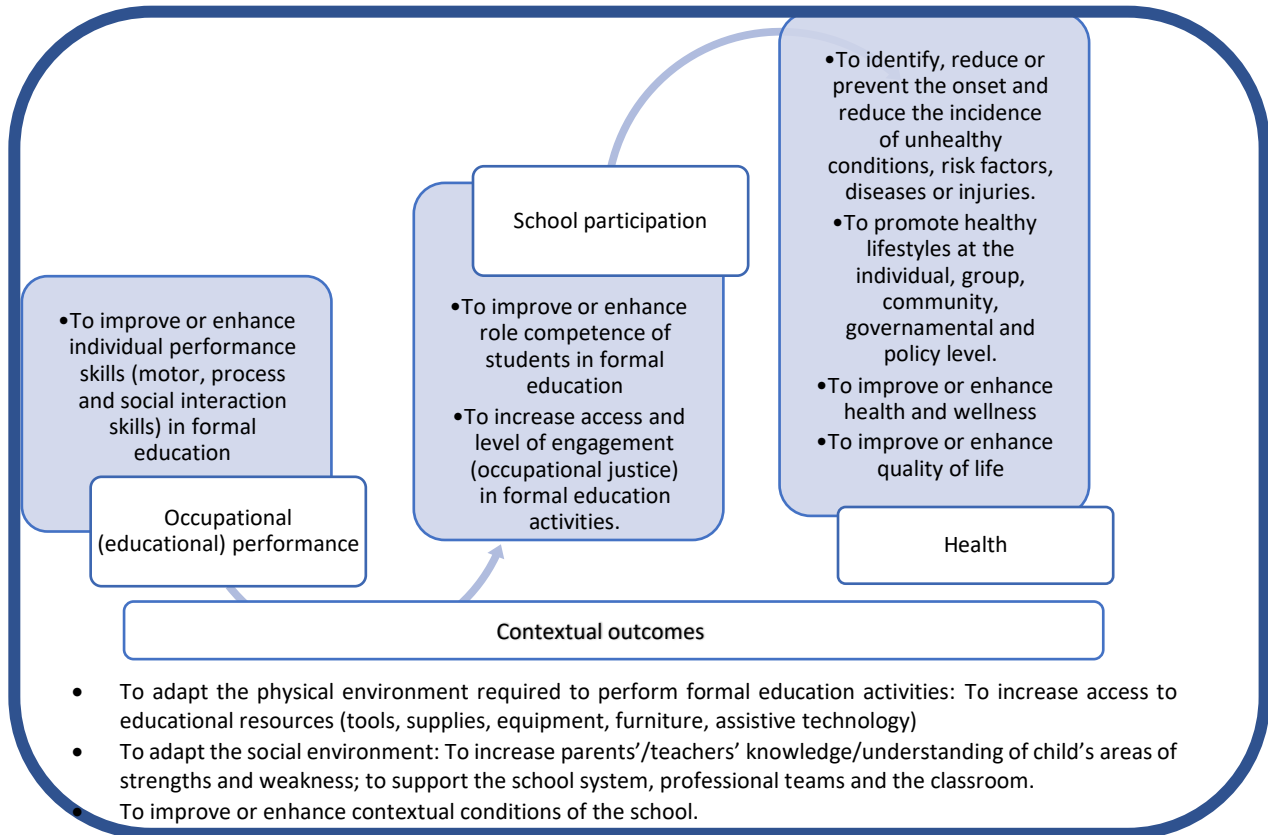


Figure 2 Outcomes school-based OT interventions

The definition of Performance skills is taken from (AOTA, 2014). These are the observable elements of action that have an implicit functional purpose and are required to perform any activity, including motor, process and social interaction skills. Motor skills are observable when a person interacts with and moves task objects and self around the task environment. Process skills are observed as a person selects, interacts with and uses task tools and materials, carries out individual actions and steps, and modifies performance when problems occur. Social interaction skills are observed during the ongoing stream of a social exchange.

With regards to contextual outcomes, these include both contextual aspects (cultural, personal, temporal and virtual conditions that are within and surrounding the student) and environmental elements (physical and social surroundings).

Timing: Studies from 1975 until now will be included in this review. This is because in the United States-US (from where most of the research about school-based OT comes), the Education for All Handicapped Children Act 1975 (EHA, Public Law 94-142, 1975), which is currently titled the Individuals with Disabilities Education Improvement Act (IDEA, Public Law 108-446, 2004), brought profound changes to the profession of OT. As a result, the school area of practice became larger. The time frame within which the studies were completed will not be limited in order to obtain a complete picture of the research which has been carried out.

Setting: Only OT interventions provided in school settings will be included in this review. This means that the studies must describe interventions provided inside a school. Studies that analyse school-based interventions in comparison, for example, with community-based interventions will also be included, but considering the data from the school setting only.

Language: A range of languages will be included in this review, with the aim of not excluding some relevant studies just because of language issues. Thus, research in English, Spanish and Arabic is covered, and further assistance will be sought for other languages if required.

Exclusion criteria:

Study design: Opinion pieces, theoretical descriptions of school-based OT models and articles describing the history of school-based OT will not be included.

Participants: Participants less than three years or more than 16 years old.

Intervention: Studies that include an intervention that is not delivered in school settings or that is not provided by an OT or assistant OT in a school setting

Outcomes: studies that analyse informal education activities, which are informal classes, programs, and activities that provide instruction or training in identified areas of interest, but which are not considered formal education.

9. Information sources:

Electronic databases: To identify potentially relevant documents, we will search CINAHL, AMED, Education Research Complete, British Education Index, Medline, Embase and PsycINFO. To seek subject-specific databases, Otseeker will be searched. These databases will be searched from March to May 2020.

Supplementary sources: To seek dissertations and theses related to this topic, Proquest Dissertation & Theses Global database will be searched. To ensure literature saturation, we will scan the reference lists of included citations (backwards citation chaining) and any citations which have cited our included citations (forwards citation chaining). We will also hand search relevant society and other organisation websites (AOTA, CanChild, RCOT, OT Practice) and contact experts in the subject area for recommendations for relevant research articles (McMaster University, AOTA Forum, CYPF-SBOT). These supplementary sources will be searched from June to August 2020.

Limitations: a subject-specific database (OTDbase) will not be used in this review because of funding limitations.

10. Search strategy:

To cover the main topics of this review, the concepts school, special education, occupational therapy, rehabilitation and school health services will be indexed through MESH (Medical Subject Headings). Supplementary concepts will be also included. See Appendix 1 for a draft MEDLINE search strategy. This search strategy has been reviewed by a librarian from the University of Exeter, and Information Specialist from University of Exeter Medical School.

The literature search will be conducted by the corresponding author of the review team, checked by a second researcher and supervised by two other reviewers.

11. Study records:

Data management: Literature search results will be uploaded to EndNote, where the protocol for screening will be included (see Appendix 2 for the screening protocol). Prior to the formal screening process, a calibration exercise will be conducted to pilot the protocol, in order to ensure its accuracy, and to support the use of EndNote. This will be done independently by the two authors involved in the screening process and by using the same five citations. Disagreements in the use of the protocol after the pilot will be discussed with a third party.

Selection process: The following steps will be conducted, according to some of the recommendations provided by Cumpston & Chandler (2019):

1. Merge search results from different sources using EndNote and remove duplicate records of the same report.
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2. Screening 1: Examine titles and abstracts to remove irrelevant reports. Decisions will be made by applying the screening protocol.
 3. Retrieve full text of the potentially relevant reports.
 4. Screening 2: Examine full-text reports for compliance of studies with eligibility criteria
 5. Correspond with investigators, where appropriate, to clarify study eligibility or descriptions.
 6. Make final decision on study inclusion and proceed to data collection

Steps 1, 3 and 5 will be conducted only by the corresponding author. Steps 2, 4 and 5 will be conducted by the corresponding author and then a second author will verify for accuracy.

Data charting process (data extraction): Information from eligible studies will be charted by using a standardised data abstraction tool that will be designed for this study. This tool will be an Excel spreadsheet, which will be created by the corresponding author of this review and revised by two members of the team. The final tool will be piloted by the two screening authors, who will test it using three of the included sources. Colquhoun et al. (2014) states that the data charting process should be iterative, and the data-charting form should be updated at any time if authors find this necessary. Yet since several steps will be conducted to test the accuracy of the form in advance, this situation is not expected. A draft of the data extraction tool can be found in Appendix 3.

The corresponding author will chart the data and then a second team's member will verify this for accuracy. This helps to reduce bias and errors in data extraction. Any disagreements will be resolved through discussion between the two authors, and if issues are not resolved, a third party will be involved.

12. Data Items:

We will extract data from the chosen studies based on the recommendations from Arksey & O'Malley (2005) and Levac et al. (2010) with regards to scoping reviews. In addition, since this review aims to explore the ingredients of school-based OT interventions, items of the TIDIER checklist will be included (Hoffmann et al., 2014). The TIDIER checklist contains the minimum recommended items for describing an intervention, which improves the possibilities of replication and guides the reporting of interventions and comparison elements of a study such as this one (see appendix 3 for further details).

An additional item of effectiveness measurement will identify if the study provides effectiveness measurements or not. Also, school's characteristics will be included in order to address the contextual complexity of these interventions, in which social background, and actors needed to implement the intervention will be included. These items are included in the intervention and context rows of Figure 3.

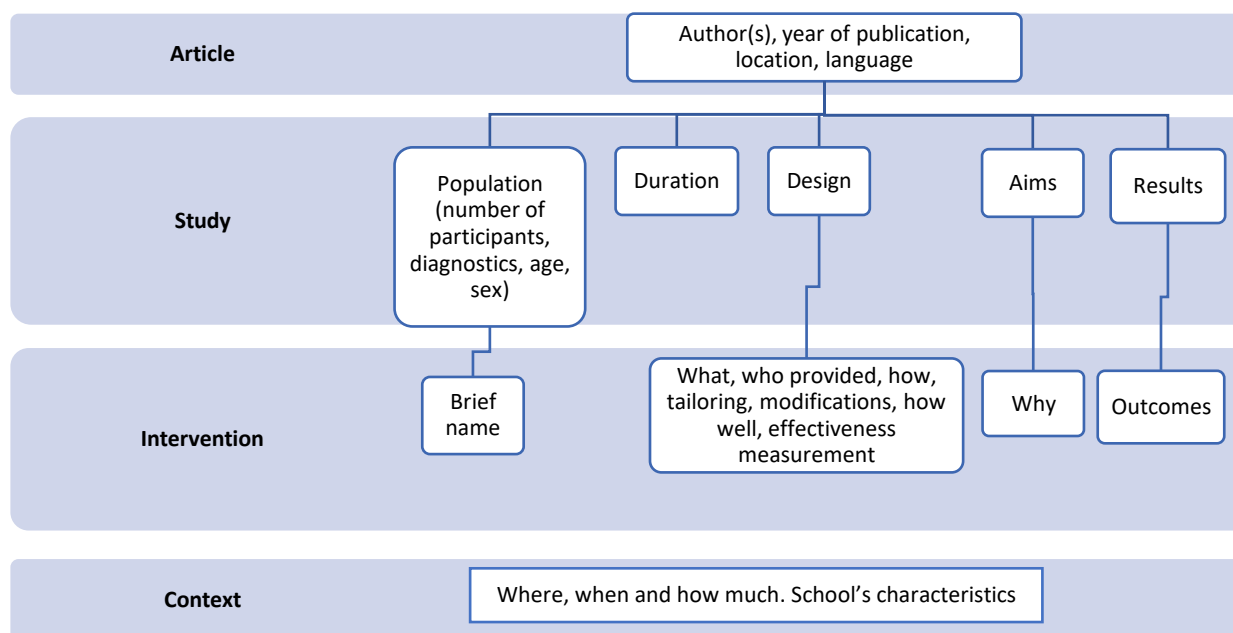


Figure 3 Data items

13. Outcomes and prioritisation: Not applicable for a scoping review

14. Critical appraisal (Risk of bias) of individual studies:

As a scoping review, the aim is to provide an overview of the existing evidence regardless of methodological quality or risk of bias. Hence, this review will not critically appraise the included sources of evidence

15. Data synthesis

In order to respond to the review question, "What is known from scientific studies about school-based OT interventions for children with SEN/disabilities?", a basic numerical analysis of the extent and nature of the studies included in the review will be done. This will allow the production of tables that will include article features and study characteristics. The first table will include information regarding the article's authors, year of publication, location and language, and will be grouped according to the study design. In the second table, information

will be provided in terms of study population, aims and important results. The results will be classified according to the outcomes included in this review.

To respond to the questions, “What school-based OT interventions have been described in scientific studies?” and “What the ingredients are of school-based OT interventions described in scientific studies?”, the intervention’s features and ingredients will be shown. This will be made by using the data items, which will be organised in one table that will describe all the school-based OT interventions found in the literature. If more than one study analyses the same intervention but with different participants or in different schools, these will be grouped under the name of the intervention. A second table will show the ingredients of each intervention, which will be accompanied by a narrative description in which a qualitative content analysis will be made. This analysis will permit the comparison of the multiple components of a complex intervention such as school-based OT and will allow the analysis of their interconnections with study participants and context.

The question, “How can the school-based OT interventions described in scientific studies be classified in the three tiers of support of the Rtl model?” will be answered by considering the same data that was used in responding to the two previous questions. However, in this case, the interventions will be organised according to the three tiers of support stated in the Rtl model. These findings will be presented in a table accompanied by a narrative description. In this description, a thematic analysis will be conducted considering fixed themes that will be extracted from the theory around tier models of intervention (e.g. Rtl, Partnering For Change).

Finally, the meaning of the results and its implications for OT practitioners in school settings will be discussed, based on numerical analyses, particularly in terms of trends and needs in research, and on qualitative analyses, regarding the usefulness of the details of the interventions included. Further implications of these results will also be indicated for future school-based practice, research and policy.

16. Risk of bias across studies (Meta-bias):

This scoping review will not critically appraise the included sources of evidence.

17. Confidence in cumulative evidence

Not applicable for scoping reviews because this method is not intended to be used to critically appraise a cumulative body of evidence.

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Appendices

Appendix 1: Draft MEDLINE search

- 1 (((school* or class*) adj3 (regular or mainstream or special*)) or "school base*").ti,ab.
(20035)
- 2 Schools/ (36899)
- 3 (education* adj3 (integrat* or inclusiv* or special*)).ti,ab. (9542)
- 4 1 or 2 or 3 (61250)
- 5 ("occupational therap*" or OT).ti,ab. (26735)
- 6 Occupational Therapy/ (13018)
- 7 School Health Services/ (16946)
- 8 Rehabilitation/ (18083)
- 9 5 or 6 or 7 or 8 (66775)
- 10 (disabil* or difficult* or "developmental disease" or disorder* or "disabled child*" or "at
risk").ti,ab. (1933851)
- 11 ("SEN" or "special* or additional*") adj2 (need* or support*).ti,ab. (65)
- 12 10 or 11 (1933881)
- 13 4 and 9 and 12 (876)
- 14 limit 13 to yr="1975 -Current" (869)

Appendix 2: Data screening protocol.

Title and abstract.

Data extractor: _____

Date of data extraction: _____

Inclusion/Exclusion codes for EndNote:

Included: 0

Excluded: 1

ARTICLE ID	Eligibility criteria		INCLUDED/EXCLUDED
	Type of study		
	Type of participants		
	Type of intervention		
	Type of outcome		
	Timing		
	Setting		
	Language		

Appendix 3: Data extraction tool.

Full text

Data extractor: _____ Date of data extraction: _____ ARTICLE ID: _____

Items	Sub-items	Definitions	
Article characteristics	Author(s)	Name the people that wrote the article	
	Year of publication	Identify the year of publication	
	Study location	Identify geographically where the study was conducted (country and city if possible)	
	Language	Identify the language in which the article was written	
Study (general)	Design	Describe the methodology the study used (general methodology and methods)	
	Duration	Identify the amount of time that the study took (from the beginning to the end)	
	Aims	Identify the objectives of the study	
	Results	Describe the outcomes that the study reaches finally.	
	Outcomes	Identify which of the two outcomes (Occupational performance and school participation) the study fits	
Study Population	Number of participants	How many children were involved in the study, and in what way according to the methodology	
	Diagnostic criteria	Identify children's diagnostics or difficulties	
	Age	Identify children's age	
	Sex	Identify the sex of the children involved in the study	
Study Intervention	Name or description	Provide the name or a phrase that describes the intervention	
	Rationale or goal (why)	Describe any rationale, theory, or goal of the elements essential to the intervention.	

	Materials (what)	Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL)	
	Procedure (what)	Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	
	Who provided	OT or OT assistant. Describe their expertise, background, specific training given	
	Modes of delivery (how)	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	
	Location (where)	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	
	When and how much	Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration and intensity.	
	Tailoring	If the intervention was planned to be personalised or adapted, describe what, why, when and how	
	Modifications	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	
	How well	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them. Actual: if intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned	
	Effective measurement	Describe if the study provides effectiveness measurements and if it does, indicate it.	
	School characteristics	Describe the context of the school in which the interventions was provided (e.g. social background, actors needed).	
	Type	According to all the information of the intervention, identify in which level of support this intervention was provided (universal, target or specialist tier of support)	

