**QUEEN'S
UNIVERSITY
BELFAST**

The Barriers and Facilitators to the Implementation of Interventions for Children with Visual Impairments, Their Parents/Guardians or Educators: A Systematic Scoping Review

Yesilkaya, E., Best, P., Byrne, B., & Marshall, G. (2019). The Barriers and Facilitators to the Implementation of Interventions for Children with Visual Impairments, Their Parents/Guardians or Educators: A Systematic Scoping Review. *Child Care in Practice*. <https://doi.org/10.1080/13575279.2019.1664988>

Published in:
Child Care in Practice

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights

© 2019 The Child Care in Practice Group.

This work is made available online in accordance with the publisher's policies. Please refer to any applicable terms of use of the publisher.

General rights

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

**The barriers and facilitators to the implementation of interventions for
children with visual impairments, their parents/guardians or educators:
A systematic scoping review**

Word count: 4,947

ABSTRACT

A body of research indicates the importance of interventions for promoting the development and progress of children with visual impairments. However, the research available on suitable interventions for this population is relatively sparse. The purpose of this review is to identify, collate and appraise the available research evidence on implementation barriers and facilitators of interventions for children with visual impairments, their parents/guardians or educators.

A systematic scoping search of peer-reviewed literature (including grey literature) was conducted from 15 June 2016 to 7 August 2016 and 2 May 2019 to 5 May 2019. Initial searches identified 6,802 papers with 15 meeting the inclusion criteria. Three additional articles were identified through hand searching giving a final total of 18 included studies. The methodological quality score of the studies was variable with 61% scored in the average quality range. Sensory strategies, a family centred approach, in-service training and routines-based activities were identified as implementation facilitators. Barriers were a lack of adaptive equipment and training for parents and professionals, complicating factors associated with the child's disability and an absence of specialists in interventions.

Effective intervention strategies differ for this targeted population which requires individualised applications associated with teacher and parent/guardian training. For health or education professionals who work with children with visual impairments, the outcomes of this review suggest that a detailed assessment and identification of the individualised needs of children and their families, coupled with carefully designed and tested support practices to meet their individualised needs as well as promoting integrated working between health and care services, can optimise the positive implications for future practice. Along with this, future consideration should be given to the identification of the needs of children with visual impairments and additional disabilities in order to facilitate the adjustment of intervention strategies for this group.

KEYWORDS

Children, intervention, carers, practice, visual impairment

Introduction

The World Health Organization (WHO) estimates that approximately 19 million children (aged between 0 and 14) worldwide have visual impairments, and 14 million of these children are blind (WHO, 2012a, 2017). Childhood blindness comprises a relatively small percentage (4%) within global causes of blindness (WHO, 2017). However, the conditions which cause visual impairments in childhood are highly varied, and the conditions can be associated with additional disabilities which require multidisciplinary support strategies for affected children (Rahi, 2005). As such, a range of services are required to support this population and their families as early as possible after diagnosis in order to prevent developmental risks (Campbell, 2007; Fraiberg, 1977; van den Broek et al., 2017; Webster

& Roe, 1998). Yet the research evidence regarding the most effective and beneficial approaches in this area is scarce.

As the uniqueness and complexity of a child's conditions makes it difficult to accurately address the needs of children, most often interventions take place to provide a multidisciplinary assessment and support for this population. However, previously conducted reviews on interventions for children with visual impairments (children (VI)) report that the research evidence is still limited to a generalised intervention model for this population. This is because existing studies have been carried out with a heterogeneous sample and small sample size which makes it difficult to identify a single intervention model for this population (Pérez-Pereira & Conti-Ramsden, 1999; van den Broek et al., 2017).

Interventions for children with visual impairments

Support for children (VI) and their families can be provided through interventions in the child's life at multiple stages. Most often support at an early age is provided through early intervention services by considering the critical period of early life development (Celeste & Kobal Grum, 2010; Chen, 2014; Fraiberg, 1977; Hatfield & McCutchen, 2008; McLinden & McCall, 2016; Pérez-Pereira & Conti-Ramsden, 1999; van den Broek et al., 2017).

Early intervention services have a comprehensive structure to minimize developmental delay through systematic practices and family support is an integral part of these services (Celeste & Kobal Grum, 2010; Ely, Gullifor, & Hollinshead, 2017; Kobal Grum & Kobal, 2010; Ross, 2017; Wiley, Parnell, & Belhorn, 2016). Early intervention for children (VI) aims to optimize residual light perception and promote development,

69 growth and independent living, as well as provide support for families and minimize the
70 cumulative effects of additional disabilities (Allen, 2011; Brambring, Rauh, & Beelmann,
71 1996; Chen, 2014; Fazzi, Signorini, Bova, Ondeï, & Bianchi, 2005). Early intervention and
72 support strategies additionally promote access to education and healthcare services (Allen,
73 2011; Brambring et al., 1996; Chen, 2014).

74 For children (VI), accessing education is as important as access to health care
75 services in terms of promoting lifelong learning and progress. However, children (VI) and
76 their families still face difficulties in getting access to education services and the delivery
77 of essential learning materials (WHO, 2012b). Specifically, school age interventions aim
78 to reduce these potential risks relating to access to education. School interventions provide
79 multi-layered support in different skill areas such as communication and socio-emotional
80 skills, fine motor and gross motor skills, cognitive skills and orientation and mobility
81 (Chen, 2014; Stearns, 2017). The implementation of interventions can differ in order to
82 meet the individualised needs of children by personalising the teaching methods (Chen,
83 2014; Wiley et al., 2016).

84 Interventions for school-age children can involve specialists, and health and
85 education services, by incorporating schools to increase the effectiveness of interventions
86 (Chen, 2014; Stearns, 2017). Along with this, if qualified professionals (such as qualified
87 teachers of children with visual impairments (QTVI) or orientation and mobility
88 specialists) are involved in interventions, they can provide an additional contribution and
89 provide further assistance for children and school personnel (Bruce, Ferrell, & Luckner,
90 2016; Opie, 2018). The comprehensive structure of school interventions can promote
91 access to information, modification of the learning environment, or adaptation of materials

92 alongside a core curriculum (Brambring et al., 1996; Chen, 2014; Fazzi et al., 2005).
93 Therefore, the consideration of different variables in implementing interventions, such as
94 types of primary diagnosis, coexisting disabilities and the nature and degree of vision, can
95 help to utilise adaptive support strategies (Correa-Torres & Bowen, 2016; Lewis & Collis,
96 1997; van den Broek et al., 2017).

97 Despite the evidence on the effectiveness of interventions for children (VI), we still
98 know very little about the barriers and facilitators to the implementation of existing
99 interventions (Brambring et al., 1996; Chen, 2014). This, in itself, is a barrier to optimising
100 the learning and development opportunities for children (VI). Based on the gaps identified,
101 the aim of this review is to synthesise the existing evidence on the components of
102 interventions designed for children (VI), their parents/guardians or educators. To achieve
103 this aim, this synthesis will address issues relating to the barriers and the facilitators of the
104 design and implementation process for interventions for children (VI), their
105 parents/guardians or educators. This review has two main objectives.

- 106
- 107 1. To identify the main barriers and facilitators of positive outcomes in existing
108 evidence.
 - 109 2. To identify the potentially beneficial components of existing interventions
110 designed to support children with visual impairments, their parents/guardians or
111 educators.

Methods

This scoping review was based upon a framework for conducting scoping reviews (Arksey & O'Malley, 2005). Scoping reviews are beneficial for mapping the key concepts of an area which is complex or has not been researched extensively in the literature. This review includes five key steps (1) identifying the research objectives (2) identifying the relevant studies (3) study selection (4) charting the data and collating and (5) summarising and reporting the results (Arksey & O'Malley, 2005, p. 9). In this review, primary searching and quality appraisal was conducted by one reviewer (EY) with a sample (20%) taken and verified by a second reviewer (PB). After determining which papers to include in the review, the data was synthesised and components of the interventions and the research methods of the studies were identified (Arksey & O'Malley, 2005). All information was charted in a word document including the authors, the date published, country, the research setting, the participants' information, methods, the components of the interventions, outcomes, limitations and the knowledge gaps determined by the authors. After charting was completed, the information was interpreted. Later a summary table was developed (Table 1).

Table 1. Characteristics of the included research studies

(Preferred location for the Table 1)

Systematic search

A comprehensive research strategy was conducted using the following databases: Ebscohost, Eric, Science Direct, ProQuest Education, Taylor & Francis Online, BEI, Zetoc,

Scopus, SSCI, JVIB, CitaTION Index: Social Science and Humanities, which were all data sources. ProQuest Dissertations & Theses: UK & Ireland, Conference proceedings, Google scholar, Open Grey, Theses Canada Portal, PSYC articles, and RNIB were used for grey literature. A hand search was applied to the reference list of full text articles.

Inclusion Criteria

(1) **Types of participants:** Included children (VI) who might have additional disabilities based on the International Classification of Diseases and Related Health problems, 10th edition WHO (2010) criteria. Their parents/guardians, educators or other service providers also took part in some studies. Studies included children aged 0 to 14 years old because support in a child's early years and in the early school years are important in future learning and development (Gorey, 2001; King, 2014).

(2) **Types of studies:** Intervention based implementations for children (VI), parents/guardians or education professionals were included. Qualitative, quantitative and mixed method studies were selected.

(3) **Language:** Only articles in English were searched because of a language restriction. Studies written in other languages were excluded.

(4) **Time period:** Studies between 1980 and 2019 were reviewed. Research studies out of this time period were excluded. 1980 was selected as a start date because some distinctive ideas (e.g., inclusion and statementing) started to appear in the field of special education at that time and these ideas led to changes in practical

applications. For searching of the related databases, the terms used (Sandieson, 2013) can be seen in Table 2.

Table 2. Search terms

(Preferred location for the Table 2)

Quality appraisal

The Mixed Method Appraisal Tool (MMAT) version 2011 (Pluye et al., 2011) was used to appraise the methodological quality of the studies. The MMAT tool was selected because the research designs of the studies vary. This tool includes clearly divided sub-sections for qualitative, quantitative and mixed method research designs. Each sub-section includes questions to appraise a selected study. The overall quality score for each study can be reached by assessing different criteria about the research questions, analysis process, recruitment of participants, sampling strategy or complete outcome data. There are four items for qualitative, quantitative (randomised trials, quantitative non-randomised trials and quantitative descriptive) studies; and three items for mix method studies. These criteria can be answered in ‘Yes, No or Can’t tell’. For each of the answers descriptors (*, **, *** or ****) can be used to represent the score. For example (*) descriptor means that one criterion was met, and (****) descriptor means that all criteria were met. The total score is divided into four to obtain a score for each article. The validity and reliability of the pilot appraisal tool was inspected by the developers (Pluye et al., 2011).

Results

As outlined in Figure 1, 6,802 papers were identified through the systematic scoping review. After screening the identified publications and removing duplications, 437 papers remained. From 437 papers, 18 studies from seven different countries (Germany (n=1), Italy (n=1), Netherlands (n=1), Turkey (n=1), USA (n=11), UK (n=1), Iran (n=1), and one non-specified) were included by taking the inclusion criteria into consideration (Figure1). The sample size of the studies varies (Table 1). The age of the sample size is between birth and 14 years old. The total sample size of the studies includes approximately 4,000 children (VI). Half of the reviewed studies (n=9, 50%) include children (VI) and additional disabilities. More than half of the studies (55%) were conducted between 1990 and 2010.

Figure 1. Flow diagram for systematic scoping review

(Preferred location for the Figure 1)

*Sourced from the PRISMA Group (Moher, Liberati, Tetzlaff, & Altman, 2009)

Methodological quality

The methodological quality of the 18 studies varied. The lowest score was 25% and the highest score was 75%. Overall three studies were considered low and 15 considered average (Table 1). Lower scores were attributed to a lack of appropriate consideration being given to the researcher's reflexivity (qualitative studies) and a lack of information on selection bias or a low response rate/outcome data in quantitative studies.

Barriers to the implementations

The existing studies reported some limitations that affected the outcomes of the interventions for children (VI). These limitations were grouped into three categories.

1. Lack of training for parents/guardians or professionals and lack of access to the information and services (n=6, 33.3%) (Behl, White, & Escobar, 1993; Dennison, 2001; Dikowski, 1995; Hill, Dodson-Burk, Hill, & Fox, 1995; Joffe, 1988; Klein, Van Hasselt, Trefelner, Sandstorm, & Brandt-Snyder, 1988).

A lack of training for parents/guardians or professionals and a lack of information about access to services are reported as factors which negatively affect the intervention outcomes.

The training needs of professionals were identified as assessments, planning or modifications of the applications and understanding the impacts of visual impairment (Behl et al., 1993; Dikowski, 1995). Additionally, a lack of parental training was identified as an issue that hinders the delivery of appropriate care for children.

2. Lack of adaptive equipment (n=4, 22%) (Chen & Haney, 1999; Dennison, 2001; Dikowski, 1995; Joffe, 1988).

Equipment used in an intervention needs to be adapted to suit each participant. Adapted equipment helps to meet the learning or development needs of children (VI). The lack of adaptive equipment used in applications may prevent the effectiveness of intervention outcomes.

3. Complicating factors associated with the child's primary condition (i.e. additional disabilities) (n=4, 22%) (Chen & Haney, 1999; Dale et al., 2019; Rowland & Schweigert, 2000; Skellenger & Hill, 1994) and absence of specialists in interventions (n=5, 27.77%) (Behl et al., 1993; Dennison, 2001; Dikowski, 1995; Hill et al., 1995; Klein et al., 1988). Children with additional disabilities and those with complex health needs require additional support tailored according to their needs. However, as the studies highlight, the parents and the professionals faced some challenges while modifying the materials or the learning environments according to the personalised needs of children. Modification and adaptation of the materials or applications require the joint involvement of trained specialists and parents/guardians. Although the involvement of enough specialists in interventions is crucial, the involvement of trained specialists who have knowledge of diagnosis, health care assessment or evaluation is a reported challenge to existing applications (Behl et al., 1993; Chen & Haney, 1999; Rowland & Schweigert, 2000).

Potentially beneficial implementation facilitators of the interventions

This review has identified potentially beneficial practices to the implementation of interventions. Potentially beneficial practices reported by the authors of the articles are grouped into four categories: (1) sensory strategies (2) a family-centred approach, (3) in-service training, (4) routines-based activities. These four categories will be discussed below.

1. Sensory strategies: The reviewed studies emphasise the importance of applying visual impairment specific strategies while working with children. Sensory strategies can be

grouped into three broad categories: (a) communication practices, (b) tactile and auditory activities, (c) orientation and mobility.

(a) Communication practices

Slightly under half of the reviewed studies (n=7, 38.8%) emphasised that developing communication skills between children and adults can promote daily life functioning because it helps to meet children's expressed needs and wants (Bregani et al., 1981; Bruce, 2002; Chen & Haney, 1999; Janssen et al., 2011; Klein, Van Hasselt, Trefelner, Sandstorm, & Brandt-Snyder, 1988; Rowland & Schweigert, 2000; Sarica et al., 2015). Communication practices most often took place within a structured intervention practice. The studies emphasise that personalised, and visual impairment specific practices, are best modified in accordance with the needs of children and their parents/guardians because this improves communication and interaction between parents/guardians and children (Bregani et al., 1981; Bruce, 2002; Chen & Haney, 1999; Janssen et al., 2011; Klein et al., 1988; Rowland & Schweigert, 2000; Sarica et al., 2015).

(b) Tactile and auditory activities

Less than one quarter of the studies (n=4, 22%) include tactile or auditory cues (i.e. sound making toys, reaching for or grasping sound making objects) (Beelmann & Brambring, 1998; Chen & Haney, 1999; Erickson et al., 2007; Joffe, 1988). These studies emphasise the benefits of providing adaptive tactile or auditory materials for children. Despite the different implementations, the research results outline that tactile and auditory cues might help children interact with their environment, encourage child independent mobility and increase communication between parents/guardians and children (Joffe, 1988; Chen & Haney, 1999; Erickson et al., 2007).

(c) Orientation and mobility

Several studies (n=3, 16.6%) focused on orientation and mobility skills through involving professionals who are experts in orientation and mobility (Beelmann & Brambring, 1998; Harley, Long, Merbler, Langley, & Wood, 1986; Joffee, 1988). In these studies, promoting orientation and mobility skills has been linked with the existence of orientation and mobility specialists in intervention. These studies report that integrating orientation and mobility within interventions with a particular focus on increasing the future mobility of children can be an effective strategy. The activities applied in reviewed studies vary according to the individualised needs of children, including locomotion skills, purposeful navigation, and orientation or mobility.

2. A family-centred approach: Within this review, 13 studies (72%) emphasise the importance of collaboration between parents/guardians and professionals (Beelmann & Brambring, 1998; Behl et al., 1993; Bregani et al., 1981; Chen & Haney, 1999; Dale et al., 2019; Dennison, 2001; Dikowski, 1995; Erickson et al., 2007; Harley et al., 1986; Janssen et al., 2011; Joffee, 1988; Klein et al., 1988; Sarica et al., 2015). A family-centred approach is an important outcome of these studies which revealed some valuable points.

Firstly, these 13 studies highlight the role of professional guidance which may provide valuable information about the progress of the child. These studies emphasise that professional guidance had a relevance for promoting parental involvement and family-professional collaboration. Additionally, giving families some opportunities to discuss their knowledge on the overall development process of their children was a helpful strategy in order to identify the needs of the child and the family. Accordingly, families had specific

knowledge on how their children learned. This kind of information helped professionals to be aware of the child's cues in order to address the needs of the children.

3. In-service training: Half of the studies (n=9, 50 %) involve teachers, early interventionists or intervention coaches to improve their competence in supporting children (VI) in the learning environments (Harley, 1986; Joffee, 1988; Skellenger and Hill, 1994; Dikowski, 1995; Chen & Haney, 1999; Rowland and Schweigert, 2000a; Dennison, 2001; Bruce, 2002; Erickson *et al.*, 2007). Less than half of the studies (n=8, 44%) emphasise a gap in teacher and early interventionist training and a lack of knowledge by teachers about visual impairment specific issues. Interventions used to address these gaps were in-service training (Bruce, 2002; Chen & Haney, 1999; Dennison, 2001; Dikowski, 1995; Rowland & Schweigert, 2000a) or visual impairment specific trainings for teachers or early interventionists as a part of interventions (Harley et al., 1986; Joffee, 1988; Skellenger & Hill, 1994). Reviewed studies (n=8, 44%) applied in-service training as a way of collaborating with families or other professionals (Bruce, 2002; Deborah Chen & Haney, 1999; Dennison, 2001; Dikowski, 1995; Harley et al., 1986; Joffee, 1988; Rowland & Schweigert, 2000; Skellenger & Hill, 1994). The trainings were often reported as beneficial for education professionals or parents/guardians because the trainings increased access to information and maintained collaboration between health or education professionals and parents/guardians.

1. Routines-based activities: More half of the studies (n=11, 61%) conducted an intervention in the home settings of children with the aim of involving

parents/guardians in interventions (Beelmann & Brambring, 1998; Behl et al., 1993; Bregani et al., 1981; Chen & Haney, 1999; Dennison, 2001; Erickson et al., 2007; Harley, 1986; Hill et al., 1995; Joffe, 1988; Klein et al., 1988; Sarica et al., 2015). Six studies (33%) implemented routines-based activities (Behl et al., 1993; Bruce, 2002; Chen & Haney, 1999; Dikowski, 1995; Rowland & Schweigert, 2000; Sarica et al., 2015). The outcomes of implemented applications indicate that routines-based activities show some positive effects. For example, it can increase parents/guardians-child interaction, parents/guardians can learn to facilitate and adapt activities in their daily routines, or they can learn to identify promoters and hindrances in terms of adapting the environment according to their child's. Additionally, parents/guardians can recognise their child's communication cues which increase the quality of communication between family members and children.

Intervention outcomes

The reviewed studies reported the benefits of the intervention for children (VI), parents/guardians and educators. Potentially beneficial components of the interventions are orientation and mobility activities, professional guidance, home-based practices, in-service training, routine-based activities, family training and communication practices (Table 3).

Table 3. The components of the reviewed interventions

(Preferred location for the Table 3)

Of the reviewed studies, 15 of them (83.3%) reported benefits of the intervention for their participants in following areas:

339 Benefits for children

- 340 1. Positive outcomes on skill acquisition (Bregani et al., 1981; Hill et al., 1995;
341 Rowland & Schweigert, 2000; Skellenger & Hill, 1994).
- 342 2. Communication development (Bruce, 2002; Chen & Haney, 1999; Janssen et al.,
343 2011).
- 344 3. Increased independence (Chen & Haney, 1999; Rowland & Schweigert, 2000).
- 345 4. Enhanced orientation and mobility performance (Beelmann & Brambring, 1998;
346 Harley et al., 1986).
- 347 5. Development of fine and gross motor skills (Beelmann & Brambring, 1998).
- 348 6. Enhanced parents/guardian-child interaction (Bregani et al., 1981; Janssen et al.,
349 2011; Sarica et al., 2015).

350 Benefits for parents/guardians are reported as

- 351 2. Increased knowledge about visual impairments (Dikowski, 1995).
- 352 3. Increased knowledge on how to support and communicate with children more
353 effectively (Chen & Haney, 1999; Dikowski, 1995; Sarica et al., 2015).
- 354 4. Increased knowledge on how to respond to the child's cues (Chen & Haney, 1999;
355 Sarica et al., 2015).
- 356 5. Reduced parental stress (Dale et al., 2019; Khooshab, Jahanbin, Ghadakpour, &
357 Keshavarzi, 2016).

358 Benefits for teachers are reported as:

- 359 1. Increased knowledge on how to assist children (Hill et al., 1995)

Null effects of the interventions are also reported by the authors. Of the reviewed studies eight of them (44.4%) report null, partially null and negative effects of the interventions or activities for their participants (Beelmann & Brambring, 1998; Behl, White, & Escobar, 1993; Chen & Haney, 1999; Dale et al., 2019; Harley et al., 1986; Janssen et al., 2011; Rowland & Schweigert, 2000; Skellenger & Hill, 1994).

Discussion

This scoping review sought to explore the barriers and facilitators of interventions carried out with children (VI), their parents/guardians or educators. This study is important in contributing knowledge by identifying the potentially beneficial components of existing interventions for this targeted group through systematic scoping methodology. The robust nature of the systematic review and quality assessment help to specify different components of the interventions. As identified, there is a scarcity of systematic scoping reviews in this targeted area.

The evidence from 18 reviewed studies indicates that the effectiveness of interventions for children (VI) requires a comprehensive approach in terms of adapting the environment and involving parents/guardians in the implementation process. Although implementation of different practices has been reported in 18 studies, some common barriers to and facilitators of approaches have emerged which can be seen below.

Key barriers to the approaches

A lack of knowledge about visual impairment, the complicating features of a child's disability and the challenges parents/guardians face in accessing information are identified as barriers to the implementation of successful interventions. Similar issues are highlighted

in other studies where the subjects are children (VI) (Gal, Dyck, & Passmore, 2010; Kappen, 2017; Probst & Borders, 2017; Stearns, 2017; van den Broek, Janssen, van Ramshorst, & Deen, 2006). Within this review, half of the studies involve children and additional disabilities. However, few studies gave details regarding the needs of those with other disabilities in addition to visual impairment. This knowledge gap is addressed in other studies by considering the increasing number of this subgroup (Argyropoulos & Thymakis, 2014; Jones & Hensley-Maloney, 2015; McLinden & McCall, 2016; Salt & Sargent, 2014). As these publications highlight, the care and support techniques are diverse and the identification of the unique needs of this subgroup may require further research.

This review shows that the professionals' role seems important in influencing the barriers experienced by children (VI) with or without additional disabilities. Therefore, the absence of specialists in interventions is revealed as a barrier in optimising positive research outcomes. The key challenges of scheduling an intervention are service coordination, organisation of the programmes and scheduling and involving certificated trainers (Beelmann & Brambring, 1998; Behl et al., 1993; Dikowski, 1995; Hill et al., 1995; Joffe, 1988; Sarica et al., 2015). Similarly, the results of the recent studies highlight the families' concerns regarding a lack of professional support and access to the services (Barbieri et al., 2016; Ben-David & Nel, 2013; Geldenhuys & Wevers, 2013; Lupón, Armayones, & Cardona, 2018). However, fewer studies indicate that the satisfaction or dissatisfaction of the families regarding the services varied regarding differences in needs, economic well-being or parental knowledge on services (Pickard & Ingersoll, 2016; Robert, Leblanc, & Boyer, 2015). In several studies, the importance of individualised support to meet the needs of children (VI) is emphasised (Lang, Hintermair, & Sarimski,

2017; Lupón et al., 2018; Oulton, Sell, Kerry, & Gibson, 2015; Roe, 2008). A difficulty identified in implementing individualised practices for each child is the requirement for a carefully designed and well-organised long-term application. This issue may require a combination of different support strategies while studying with children (VI) and who has additional disabilities (Aitken, 2000; McLinden & McCall, 2016; Solebo & Rahi, 2014). Overall, the evidence provides valuable information in understanding what kind of intervention strategies were applied and what kind of strategies have worked.

Key facilitators of the approaches

The outcomes of this review show that a detailed and ongoing assessment of the intervention process is necessary for increasing potential benefits (Bregani et al., 1981; Dennison, 2001; Erickson et al., 2007; Hill et al., 1995; Rowland & Schweigert, 2000). It is emphasised that home visits, adaptive equipment and vision specific training for parents/guardians and professionals have the potential to optimise the benefits of the intervention outcomes. Similarly, the literature indicates the possible benefits of home visits on building relationships between participants and providers, monitoring progress and exploring participant experiences (Avellar et al., 2014; Paton, Grant, & Tsourtos, 2013). However, it has been suggested that more research is needed to understand the effects of home visits on research outcomes (Avellar et al., 2014; Paton et al., 2013; Peacock, Konrad, Watson, Nickel, & Muhajarine, 2013). Additionally, Peacock et al. (2013) argue that interventions which include home visits should be tailored to meet the participants' needs to prevent unintended outcomes. Similar to the results of this review, training needs of parents or professionals is emphasised in the literature in order to develop

appropriate and effective skills to support children (VI) (Ben-David & Nel, 2013; Geldenhuys & Wevers, 2013).

The potentially beneficial practices of existing applications for children (VI) were mapped into four stages (Figure 2). These are: (1) a detailed assessment of participants' needs, (2) the family-centred approach for promoting implementations of interventions, (3) feedback and suggestions provided by the participants, (4) revisiting the techniques and strategies after receiving participants' feedback.

Figure 2. Mapping the outcomes of the studies: Potentially beneficial components of the interventions for children with visual impairments

(Preferred location for the Figure 2)

Strengths and limitations

This robust and comprehensive search has been conducted to identify the key components of existing interventions for children (VI), their families or education professionals. Additionally, the barriers to or facilitators of the strategies that have been addressed in the reviewed research studies were identified.

Although a systematic methodological framework is followed through the reviewing process, there are still some limitations. Firstly, a single reviewer interpreted the data and mapped the results which can result in reviewer selection bias. A relatively small number of studies were identified regarding the selection criteria of this review. No meta-analysis was conducted due to heterogeneity within the sample. Secondly, the methodological procedure of this review is based upon the framework of Arksey and

O'Malley (2005) and it does not reflect any other alternative approaches to the scoping review. Thirdly, as an inclusion criterion, all studies reviewed were only in English which is a language bias. As a result of this criterion some intervention studies that have been conducted with targeted populations published in languages other than English were excluded. This might limit the outcomes of this review.

To our knowledge, from the results of this review it is difficult to separate the impact of additional disabilities on the implementation of interventions for this population, and this situation should inform the identified strategies in future research. Limitations of the theoretical robustness of the articles identified a need for future research to put the emphasis on the broader implementation of interventions through a comprehensive theoretical framework.

Future research

The review results indicate that although a variety of practices are available, there is still a lack of information on the process of design and implementation of effective interventions. A lack of research evidence on details of the applications is evident on the implementation of strategies for children in primary school settings. This issue covers the determination of teachers' needs in order to understand how educators possibly meet the needs of pupils with visual impairments and those with additional disabilities. Identifying these topics through a robust theoretical framework would make the issues clear as a few studies report that limitations in the intervention process may have occurred because of a lack of needs assessment and poor design (Harley et al., 1986; Joffe, 1988; Rowland & Schweigert, 2000). Overall, the scarcity of studies in the targeted research area, the complex nature of

interventions for children (VI), and the limited information provided about the design of interventions in identified studies were the main issues that appeared during the review process. It is expected that the detailed outcomes of this study will provide some ideas for future researchers and practitioners by considering the different components of the interventions for children (VI), their parents/guardians and educators before designing such interventions.

Conclusion

This review on interventions for children (VI), their families and education professionals identified some implementation barriers and facilitators to existing strategies. The identified implementation facilitators were sensory strategies, a family-centred approach, in-service training and routines-based activities. These facilitators were reported as factors which may optimise the positive outcomes of the practices, particularly in the development and progress of children (VI). These factors can also increase parental involvement in interventions. The identified barriers were a lack of adaptive equipment, training for parents/guardians and professionals, complicating factors associated with a child's disability and an absence of specialists in interventions. As far as could be identified in this review, the diversity of this population and the scarcity of research on this group resulted in a lack of research evidence. This makes it difficult to identify effective strategies within interventions for different age groups of children (VI). The results of this review highlight the importance of a personalised needs assessment before carrying out an intervention. Additionally, the involvement of carefully designed and tested strategies in interventions can optimise positive outcomes for future practices carried out by health and care or

education services. In addition, it emerged that the identification of the needs of children (VI) and additional disabilities should be considered in order to develop effective support strategies for this group.

References

- Aitken, S. (2000). *Teaching children who are deafblind: Contact, communication and learning*. London: David Fulton.
- Allen, G. (2011). Early intervention: Smart investment, massive savings the second independent report to Her Majesty's Government. In *Independent Review*.
- Argyropoulos, V., & Thymakis, P. (2014). Multiple disabilities and visual impairment: An action research project. *Journal of Visual Impairment & Blindness*, 108(2), 163–167. <https://doi.org/10.1111/j.1467-9639.1991.tb00167.x>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Avellar, S., Paulsell, D., Sama-Miller, E., Del Grosso, P., Akers, L., & Kleinman, R. (2014). *Home visiting evidence of effectiveness review: Executive summary*.
- Barbieri, M. C., Broekman, G. V. D. Z., Souza, R. O. D. de, Lima, R. A. G. de, Wernet, M., & Dupas, G. (2016). Rede de suporte da família da criança e adolescente com deficiência visual: Potencialidades e fragilidades. *Ciência & Saúde Coletiva*, 21(10), 3213–3223. <https://doi.org/10.1590/1413-812320152110.19562016>
- Beelmann, A., & Brambring, M. (1998). Implementation and effectiveness of a home-based early intervention program for blind infants and preschoolers. *Research in Developmental Disabilities*, 19(3), 225–244.
- Behl, D., White, K. R., & Escobar, C. M. (1993). New Orleans early intervention study of children with visual impairments. *Early Education and Development*, 4(4), 256–274. <https://doi.org/10.1207/s15566935eed0404>
- Ben-David, B., & Nel, N. (2013). Applying Bronfenbrenner's ecological model to identify the negative influences facing children with physical disabilities in rural areas in Kwa-Zulu Natal. *Africa Education Review*, 10(3), 410–430. <https://doi.org/10.1080/18146627.2013.853538>
- Brambring, M., Rauh, H., & Beelmann, A. (1996). *Early childhood intervention: Theory, evaluation, and practice* (M. Brambring, H. Rauh, & A. Beelmann, Eds.). Berlin; New York: Walter de Gruyter.
- Bregani, P., Ceppellini, C., Cerabolini, R., Contini, O., Damascelli, A., Livingstone, J. B., ... Rocca, A. (1981). Blind children: Prevention of emotional disturbances by early intervention with parents and child. *Courrier*, 31, 256–262.
- Bruce, S. M. (2002). Impact of a communication intervention model on teachers' practice with children who are congenitally deaf-blind. *Journal of Visual Impairment & Blindness*, 96(3), 154–168.
- Bruce, S. M., Ferrell, K., & Luckner, J. L. (2016). Guidelines for the administration of

- educational programs for students who are deaf/hard of hearing, visually impaired, or deafblind. *Journal of the American Academy of Special Education Professionals*, 47, 47–59.
- Campbell, J. (2007). Understanding the emotional needs of children who are blind. *Journal of Visual Impairment & Blindness*, 101(7), 351–355.
- Celeste, M., & Kobal Grum, D. (2010). Social integration of children with visual impairment: A developmental model. *Elementary Education Online*, 9(1), 11–22. Retrieved from <http://ilkogretim-online.org.tr>
- Chen, Deborah. (2014). *Essential elements in early intervention: Visual impairment and multiple disabilities* (D. Chen, Ed.). American Foundation for the Blind.
- Chen, Deborah, & Haney, M. (1999). *Promoting learning through active interaction. Project PLAI. Final report*. Washington.
- Correa-Torres, S. M., & Bowen, S. K. (2016). Recognizing the needs of families of children and youth who are deafblind. *American Annals of the Deaf*, 4(Fall), 454–461.
- Dale, N. J., Sakkalou, E., O'Reilly, M. A., Springall, C., Sakki, H., Glew, S., ... Salt, A. T. (2019). Home-based early intervention in infants and young children with visual impairment using the Developmental Journal: longitudinal cohort study. *Developmental Medicine & Child Neurology*, 61(6), 697–709. <https://doi.org/10.1111/dmcn.14081>
- Dennison, E. M. (2001). *Project VIISA Outreach. Outreach services to assist states to replicate a training model for early interventionists in low incidence disability condition: Blindness and visual impairment. Final report*. Logan, Utah.
- Dikowski, T. J. (1995). *A parent training programme for increasing the visual development of school-aged children*. Nova Southeastern University.
- Ely, M. S., Gullifor, K., & Hollinshead, T. (2017). Family-centered early intervention visual impairment services through matrix session planning. *Journal of Visual Impairment & Blindness*, 111(2), 169–174.
- Erickson, K. A., Hatton, D., Roy, V., Fox, D., & Renne, D. (2007). Literacy in early intervention for children with visual impairments: Insights from individual cases. *Journal of Visual Impairment & Blindness*, 101(2), 1–26. Retrieved from <http://eric.ed.gov/?id=EJ755444>
- Fazzi, E., Signorini, S. G., Bova, S. M., Ondeï, P., & Bianchi, P. E. (2005). Early intervention in visually impaired children. *International Congress Series*, 1282, 117–121. <https://doi.org/10.1016/j.ics.2005.05.200>
- Fraiberg, S. L. (1977). *Insights from the blind: Comparative studies of blind and sighted infants*. New York: Basic Books.
- Gal, E., Dyck, M. J., & Passmore, A. (2010). Relationships between stereotyped movements and sensory processing disorders in children with and without developmental or sensory disorders. *American Journal of Occupational Therapy*, 64(3), 453–461. <https://doi.org/10.5014/ajot.2010.09075>
- Geldenhuis, J. L., & Wevers, N. E. J. (2013). Ecological aspects influencing the implementation of inclusive education in mainstream primary schools in the Eastern Cape, South Africa. *South African Journal of Education*, 33(3), 1–18. <https://doi.org/10.15700/201503070804>
- Gorey, K. M. (2001). Early childhood education: A meta-analytic affirmation of the

- short- and long- term benefits of educational opportunity. *School Psychology Quarterly*, 16(1), 9–30. <https://doi.org/10.1521/scpq.16.1.9.19163>
- Harley, R. K., Long, R. G., Merbler, J. B., Langley, M. B., & Wood, T. A. (1986). *The development of a program in orientation and mobility for multi-handicapped blind infants (Peabody Mobility Kit for infants). Final report*. Washington.
- Hatfield, N., & McCutchen, D. (2008). *Early intervention guidelines for infants and toddlers with visual impairment in Washington State*. Washington.
- Hill, M. M., Dodson-Burk, B., Hill, E. W., & Fox, J. (1995). An infant sonicguide intervention program for a child with a visual disability. *Journal of Visual Impairment & Blindness*, 89(4), 329–336.
- Janssen, M. J., Riksen-Walraven, J. M., van Dijk, J. P. M., Huisman, M., & Ruijsenaars, W. A. J. J. M. (2011). Fostering harmonious interactions in a boy with congenital deaf-blindness: A single case study. *Journal of Visual Impairment & Blindness*, 105(9), 560–572. Retrieved from http://apps.webofknowledge.com.proxy2.library.mcgill.ca/full_record.do?product=WOS&search_mode=AdvancedSearch&qid=9&SID=3AfCcpA4VdHzWa9gkaT&p age=18&doc=178&cacheurlFromRightClick=no
- Joffe, E. (1988). A home-based orientation and mobility program for infants and toddlers. *Journal of Visual Impairment & Blindness*, 87(7), 282–285.
- Jones, B. A., & Hensley-Maloney, L. (2015). Meeting the needs of students with coexisting visual impairments and learning disabilities. *Intervention in School and Clinic*, 50(4), 226–233. <https://doi.org/10.1177/1053451214546401>
- Kappen, B. (2017). Keys to educational success: Teaching students with visual impairments and multiple disabilities. *Journal of Visual Impairment & Blindness*, 111(1), 88.
- Khooshab, E., Jahanbin, I., Ghadakpour, S., & Keshavarzi, S. (2016). Managing parenting stress through life skills training: A supportive intervention for mothers with visually impaired children. *International Journal of Community Based Nursing and Midwifery*, 4(3), 265–273. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/27382593>
- King, K. (2014). *Importance of early childhood education* (Ferris State University). Retrieved from <http://hdl.handle.net/2323/5688>
- Klein, B., Van Hasselt, V. B., Trefelner, M., Sandstorm, D. J., & Brandt-Snyder, P. (1988). The parent and toddler training project for visually impaired and blind multihandicapped children. *Journal of Visual Impairment & Blindness*, 82(2), 59–64.
- Kobal Grum, D., & Kobal, B. (2010). Early intervention of the blind and visually impaired children and their families: A Slovenian case. *Hrvatska Revija Za Rehabilitacijska Istraživanja*, 46(2), 116–127.
- Lang, M., Hintermair, M., & Sarimski, K. (2017). Social-emotional competences in very young visually impaired children. *British Journal of Visual Impairment*, 35(1), 29–43. <https://doi.org/10.1177/0264619616677171>
- Lewis, V., & Collis, G. (1997). *Blindness and psychological development in young children* (V. Lewis & G. M. Collis, Eds.). Leicester: The British Psychological Society.
- Lupón, M., Armayones, M., & Cardona, G. (2018). Quality of life among parents of

- children with visual impairment: A literature review. *Research in Developmental Disabilities*, 83(July 2017), 120–131. <https://doi.org/10.1016/j.ridd.2018.08.013>
- McLinden, M., & McCall, S. (2016). *Learning through touch: Supporting children with visual impairments and additional difficulties*. New York: Routledge.
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *PLoS Medicine*, 6(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Opie, J. (2018). Educating students with vision impairment today: Consideration of the expanded core curriculum. *British Journal of Visual Impairment*, 36(1), 75–89. <https://doi.org/10.1177/0264619617730861>
- Oulton, K., Sell, D., Kerry, S., & Gibson, F. (2015). Individualizing hospital care for children and young people with learning disabilities: It's the little things that make the difference. *Journal of Pediatric Nursing*, 30(1), 78–86. <https://doi.org/10.1016/j.pedn.2014.10.006>
- Paton, L., Grant, G., & Tsourtos, G. (2013). Exploring mothers' perspectives of an intensive home visiting program in Australia: A qualitative study. *Contemporary Nurse*, 43(2), 191–200. <https://doi.org/10.5172/conu.2013.43.2.191>
- Peacock, S., Konrad, S., Watson, E., Nickel, D., & Muhajarine, N. (2013). Effectiveness of home visiting programs on child outcomes: A systematic review. *BMC Public Health*, 13(1), 17. <https://doi.org/10.1186/1471-2458-13-17>
- Pérez-Pereira, M., & Conti-Ramsden, G. (1999). *Language development and social interaction in blind children*. Hove: Psychology.
- Pickard, K. E., & Ingersoll, B. R. (2016). Quality versus quantity: The role of socioeconomic status on parent-reported service knowledge, service use, unmet service needs, and barriers to service use. *Autism*, 20(1), 106–115. <https://doi.org/10.1177/1362361315569745>
- Pluye, P., Robert, E., Cargo, M., Bartlett, G., O'Cathain, A., Griffiths, F., ... Rousseau, M. C. (2011). *A mixed methods appraisal tool for systematic mixed studies reviews*. Retrieved from http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/attach/84371689/MMA_T_2011_criteria_and_tutorial_2011-06-29updated2014.08.21.pdf
- Probst, K. M., & Borders, C. M. (2017). Comorbid deafblindness and autism spectrum disorder—characteristics, differential diagnosis, and possible interventions. *Review Journal of Autism and Developmental Disorders*, 4(2), 95–117. <https://doi.org/10.1007/s40489-016-0100-2>
- Rahi, J. S. (2005). Health services experiences of parents of recently diagnosed visually impaired children. *British Journal of Ophthalmology*, 89(2), 213–218. <https://doi.org/10.1136/bjo.2004.051409>
- Robert, M., Leblanc, L., & Boyer, T. (2015). When satisfaction is not directly related to the support services received: Understanding parents' varied experiences with specialised services for children with developmental disabilities. *British Journal of Learning Disabilities*, 43(3), 168–177. <https://doi.org/10.1111/bld.12092>
- Roe, J. (2008). Social inclusion: Meeting the socio-emotional needs of children with vision needs. *British Journal of Visual Impairment*, 26(2), 147–158. <https://doi.org/10.1177/02646196080260020101>
- Ross, M. C. (2017). *Promoting joint attention in children with visual impairment:*

- Proposing an intervention using modified strategies from joint attention symbolic play engagement regulation (JASPER) (The Ohio State University). Retrieved from https://etd.ohiolink.edu/!etd.send_file?accession=osu1500289755492111&disposition=inline
- Rowland, C., & Schweigert, P. (2000). *Creating classroom environments that nurture independence for children who are deafblind. Final report*. Portland.
- Salt, A., & Sargent, J. (2014). Common visual problems in children with disability. *Archives of Disease in Childhood*, 99(12), 1163–1168. <https://doi.org/10.1136/archdischild-2013-305267>
- Sandieson, R. (2013). Pearl harvesting comprehensive search filters for searching research literature. Retrieved September 18, 2016, from <https://pearlharvestingsearchthesaurus.wikispaces.com/Structure+of+Wiki+According+to+PICOS>
- Sarica, A. D., Akcamete, G., & Gurgur, H. (2015). A mother-child interaction intervention for mothers of toddlers with visual impairments. *International Journal of Early Childhood Special Education*, 7(1), 151–169.
- Skellenger, A. C., & Hill, E. W. (1994). Effects of a shared teacher-child play intervention on the play skills of three young children who are blind. *Journal of Visual Impairment & Blindness*, 88(5), 433–445.
- Solebo, A. L., & Rahi, J. (2014). Epidemiology, aetiology and management of visual impairment in children. *Archives of Disease in Childhood*, 99(4), 375–379. <https://doi.org/10.1136/archdischild-2012-303002>
- Stearns, E. M. (2017). Effective collaboration between physical therapists and teachers of students with visual impairments who are working with students with multiple disabilities and visual impairments. *Journal of Visual Impairment & Blindness*, 111(2), 166–169. <https://doi.org/10.1177/0145482X1711100208>
- van den Broek, E. G. C., Janssen, C. G. C., van Ramshorst, T., & Deen, L. (2006). Visual impairments in people with severe and profound multiple disabilities: An inventory of visual functioning. *Journal of Intellectual Disability Research*, 50(6), 470–475. <https://doi.org/10.1111/j.1365-2788.2006.00804.x>
- van den Broek, E. G. C., van Eijden, A. J. P. M., Overbeek, M. M., Kef, S., Sterkenburg, P. S., & Schuengel, C. (2017). A systematic review of the literature on parenting of young children with visual impairments and the adaptations for video-feedback intervention to promote positive parenting (VIPP). *Journal of Developmental and Physical Disabilities*, 29(3), 503–545. <https://doi.org/10.1007/s10882-016-9529-6>
- Webster, A., & Roe, J. (1998). *Children with visual impairments: Social interaction, language and learning*. London: Routledge.
- Wiley, S., Parnell, L., & Belhorn, T. (2016). Promoting early identification and intervention for children who are deaf or hard of hearing, children with vision impairment, and children with deafblind conditions. *Journal of Early Hearing Detection and Intervention*, 1(1), 26–33. <https://doi.org/10.15142/T3FW23>
- World Health Organization. (2012a). Global data on visual impairments 2010. Retrieved February 2, 2016, from <http://www.who.int/blindness/GLOBALDATAFINALforweb.pdf>
- World Health Organization. (2012b, August). *Early childhood development and disability*. Retrieved from

722 https://apps.who.int/iris/bitstream/handle/10665/75355/9789241504065_eng.pdf;jsessionid=77B839F728DB4AEB370F8590F398C226?sequence=1
723
724 World Health Organization. (2017). Blindness and visual impairment. Retrieved May 20,
725 2018, from Blindness and visual impairment website: [http://www.who.int/news-](http://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment)
726 [room/fact-sheets/detail/blindness-and-visual-impairment](http://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment)
727
728
729
730

Table 1.Characteristics of the included research studies

No	Study (Origin)	Sample	Method	Outcomes	Diagnosis	Quality appraisal (%)
1	(Harley et al., 1986) USA	Infants (n=22), parents, teachers or nurses	Experimental design	Positive outcomes in cognitive, movement and touch areas	Visual impairment and additional disabilities	75
2	(Erickson et al., 2007) USA	Children (n=3) and their families, early interventionists (n=2)	Qualitative	Positive outcomes highlight the role of early interventionists	Visual impairment	75
3	(Skellenger & Hill, 1994) USA	Children (n=3), their teachers	Multiple probe technique	Positive outcomes in increasing play behaviour	Visual impairment	75
4	(Rowland & Schweigert, 2000) USA	Children (n=12), project staff	Mixed method	Positive outcomes in communication and social interaction skills	Deaf-blindness	25
5	(Joffee, 1988) USA	Infants (n=20) and their caregivers, occupational therapist, physical therapist, early intervention teacher,	Qualitative	Positive outcomes in foundation needed for the future development of mobility	Visual impairment	25
6	(Dikowski, 1995) USA	Children (n=50), and their parents, teachers, psychologists and other professionals	Quantitative	Increased parental knowledge about visual impairments	Visual impairment	50
7	(Sarica et al., 2015) Turkey	Children (n=2), their caregivers	Action research	Positive outcomes in maternal interactional behaviours and children's interactional behaviours	Visual impairment	75

(Continued)

Table 1. Continued

8	(Deborah Chen & Haney, 1999) USA	Infants (n=25) and their caregivers, early interventionists	Qualitative	Increased parental knowledge about visual impairments and communicative interaction	Deaf-blindness	75
9	(Janssen et al., 2011) Netherlands	Child (n=1), caregiver and interaction coach	Qualitative	Positive outcomes in caregiver behaviour	Visual impairment and additional disabilities	50
10	(Beelmann & Brambring, 1998) Germany	Children (n=10), their parents, psychologists (n=3), special education teacher (n=1)	Case control	Positive outcomes in development, improved orientation and mobility performance	Visual impairment	75
11	(Bregani et al., 1981) Italy	Children (n=8), their parents, interventionists	Experimental	Positive outcomes of parental training	Visual impairment	50
12	(Bruce, 2002) USA	Children (n=3), teachers (n=2)	Qualitative	Positive outcomes regarding service training	Deaf-blindness	75
13	(Klein, Van Hasselt, Trefelner, Sandstorm, & Brandt-Snyder, 1988) USA	Children (n=22) and their caregivers, trainers	Experimental design	Actual results were not determined but the intervention is targeted as successful	Visual impairment and additional disabilities	25
14	(Hill et al., 1995) Non-determined	Child (n=1), observer	Experimental design	Partially successful. Positive outcomes in reaching out and locating an object	Visual impairment and additional disabilities	75
15	(Behl et al., 1993) USA	Children (n=35) and their caregivers	Randomised control trial	The results highlight the requirement of more comprehensive intervention for infants and toddlers	Visual impairment	50
16	(Dennison, 2001) USA	1,334 professionals who made an impact on 3,455 infants' life	Mixed method	Effectiveness of the project (in-service training model) is reported	Visual impairment with or without additional disabilities	75

(Continued)

Table 1. Continued

17	(Dale et al., 2019) UK	Children (n=54) and their parents, practitioners	Longitudinal observational study	No difference in developmental setback	Cortical visual impairments	75
18	(Khooshab et al., 2016) Iran	Mothers (n=52) with their children	Randomised control trial	Lower parenting stress Intervention group showed reduced parenting stress	Blindness	75

Table 2. Search terms

Population

(Child* OR “early child education*” OR “primary education” OR “Primary class*”
OR “Primary school”)

Issue

(“vis* impair*” OR “vision disorder*” OR “vision-impair*” OR “vision
deficiency” OR blind* OR “vision loss” OR “vision problem*” OR “vision
difficult*” OR “impaired vision” OR “partial vision” OR “vision deficiency” OR
“partial sight*” OR “sight loss” OR “low vision”)

Table 3. The components of the reviewed interventions

Components	Reviewed studies
------------	------------------

Orientation and mobility	Harley et al., 1986; Joffe, 1988
Collaboration between families and professionals	Beelmann & Brambring, 1998; Behl et al., 1993; Chen & Haney, 1999; Dale et al., 2019; Dennison, 2001; Dikowski, 1995; Erickson et al., 2007; Harley et al., 1986; Janssen et al., 2011; Joffe, 1988; Klein et al., 1988; Sarica et al., 2015
Professional guidance	Behl et al., 1993; Bregani et al., 1981; Bruce, 2002; Erickson et al., 2007; Harley et al., 1986; Klein et al., 1988
Home-based practices	Beelmann & Brambring, 1998; Behl et al., 1993; Bregani et al., 1981; Chen & Haney, 1999; Dale et al., 2019; Dennison, 2001; Harley et al., 1986; Joffe, 1988; Khooshab et al., 2016; Klein et al., 1988; Sarica et al., 2015; Skellenger & Hill, 1994
In-service training	Bruce, 2002; Chen & Haney, 1999; Dennison, 2001; Dikowski, 1995; Harley et al., 1986; Joffe, 1988; Rowland & Schweigert, 2000; Skellenger & Hill, 1994
Routine-based activities	Bruce, 2002; Dikowski, 1995; Rowland & Schweigert, 2000
Family training	Chen & Haney, 1999; Dale et al., 2019; Harley et al., 1986; Joffe, 1988; Sarica et al., 2015
Communication practices	Bregani et al., 1981; Chen & Haney, 1999; Janssen et al., 2011; Klein et al., 1988; Rowland & Schweigert, 2000; Sarica et al., 2015